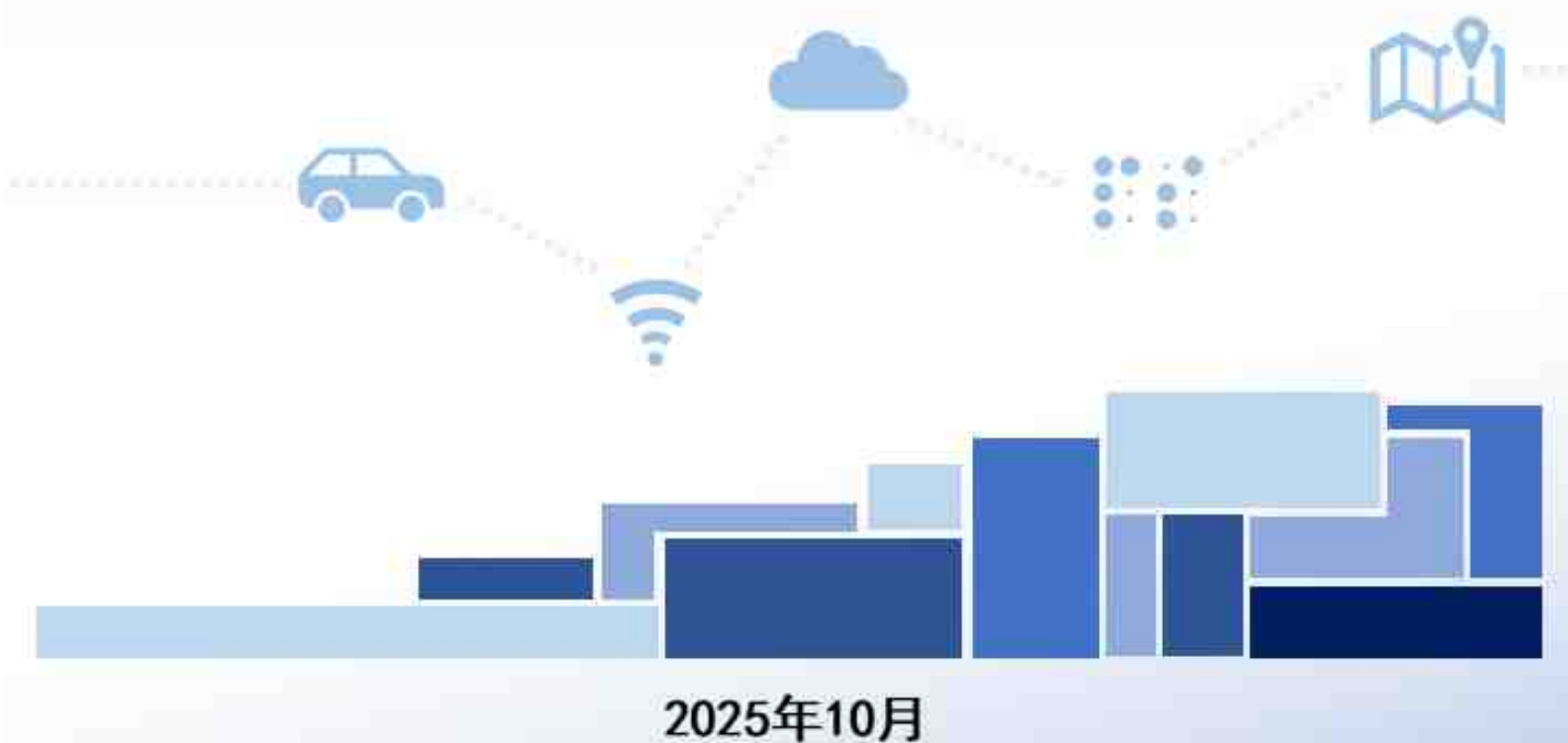




中国汽车工程学会  
China Society of Automotive Engineers

# 车路云一体化系统云控基础平台 功能场景参考架构2.0



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2024 1 “

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2024 6

1.0 <sup>1</sup>

1.0

Model-Based Systems Engineering, MBSE RFLP

Requirements-Function-Logical-Physical

2.0 <sup>2</sup>

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<sup>1</sup> 2024 6 1.0

<sup>2</sup> 2021 5 2.0

<sup>3</sup> 2023 1

<sup>4</sup> 2024 10

<sup>5</sup> 2024 10

<sup>6</sup> 2024 12 “ ”

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|------------|-------|-----|
| 1          | ..... | 9   |
| 1.1        | ..... | 9   |
| 1.2        | ..... | 10  |
| 1.3        | ..... | 11  |
| 1.4        | ..... | 11  |
| 2          | ..... | 13  |
| 2.1        | ..... | 13  |
| 2.2        | ..... | 14  |
| 3          | ..... | 22  |
| 3.1        | ..... | 22  |
| 3.2        | ..... | 44  |
| 3.3        | ..... | 49  |
| 4          | ..... | 52  |
| 4.1        | ..... | 52  |
| 4.2        | ..... | 53  |
| 4.3        | ..... | 54  |
| 4.4        | ..... | 58  |
| 4.5        | ..... | 62  |
| 4.6        | ..... | 67  |
| 4.7        | ..... | 71  |
| 4.8        | ..... | 75  |
| 4.9        | ..... | 79  |
| 4.10       | ..... | 84  |
| 4.11       | ..... | 88  |
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| 4.13       | ..... | 97  |
| 4.14       | ..... | 102 |
| 4.15       | ..... | 107 |
| 4.16       | ..... | 112 |
| 4.17       | ..... | 117 |
| 4.18       | ..... | 122 |
| 4.19       | ..... | 127 |
| 4.20       | ..... | 132 |
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| 4.24 C-AEB | ..... | 153 |

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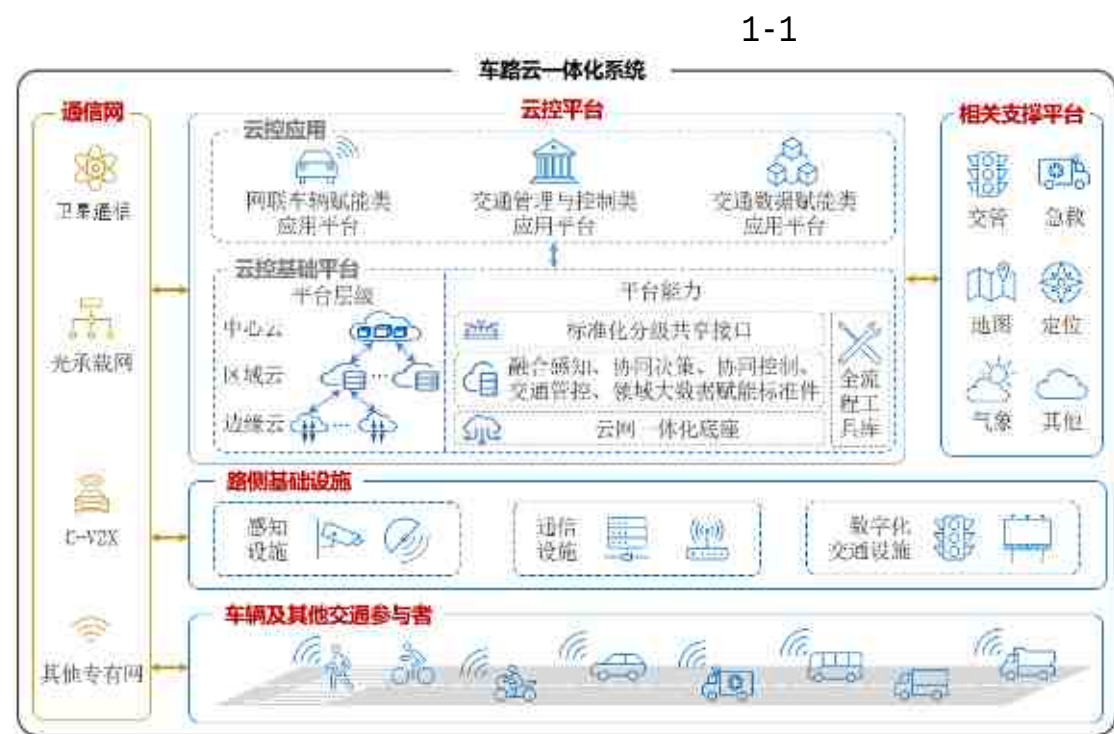
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| 4.25 | C-ACC | ..... | 158 |
| 4.26 | C-AVP | ..... | 163 |
| 4.27 |       | ..... | 169 |
| 4.28 |       | ..... | 174 |
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| 4.30 |       | ..... | 184 |
| 4.31 |       | ..... | 189 |
| 4.32 |       | ..... | 195 |
| 5    |       | ..... | 203 |
| 6    |       | ..... | 204 |
| 6.1  | A     | ..... | 204 |
| 6.2  | B     | ..... | 276 |



1

1.1

Cyber-Physical Systems, CPS



1-1

“ 1 ”

“ N ”

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“ 5+2+1 ”

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1-2

1.2

MBSE

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1.0

1.0 15

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**1.3**

**1.4**

Systems Engineering  
System Architecture  
Reference Architecture  
Model Based Systems Engineering/MBSE

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Document Based Systems Engineering/DBSE  
Systems Modeling Language/SysML  
HMI

2

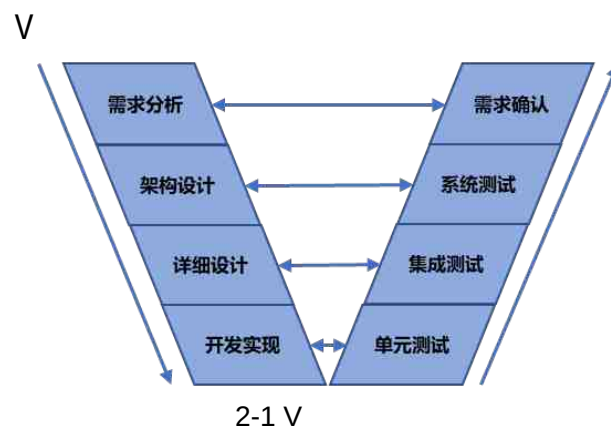
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## Systems Engineering



V

System Architecture  
Architecture

Structure

ISO/IEC/IEEE 42010

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“ ” “ ”

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“ ” “ ”

ISO/IEC/IEEE 42030

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“ ” “ ” “ ” (Life

(Reference Architecture)

2.0

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## 2.2

### 2.2.1 MBSE

#### 2.2.1.1 MBSE

MBSE

Model Based Systems Engineering

DBSE

Document Based

Systems Engineering

MBSE

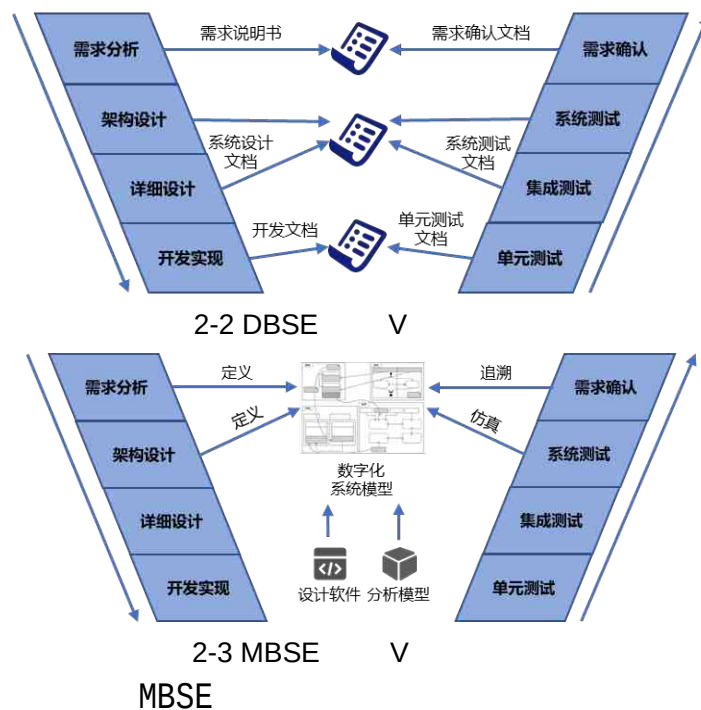
MBSE “ ”

MBSE

DBSE MBSE

MBSE

MBSE



Object Management Group

OMG International Council on Systems

Engineering INCOSE

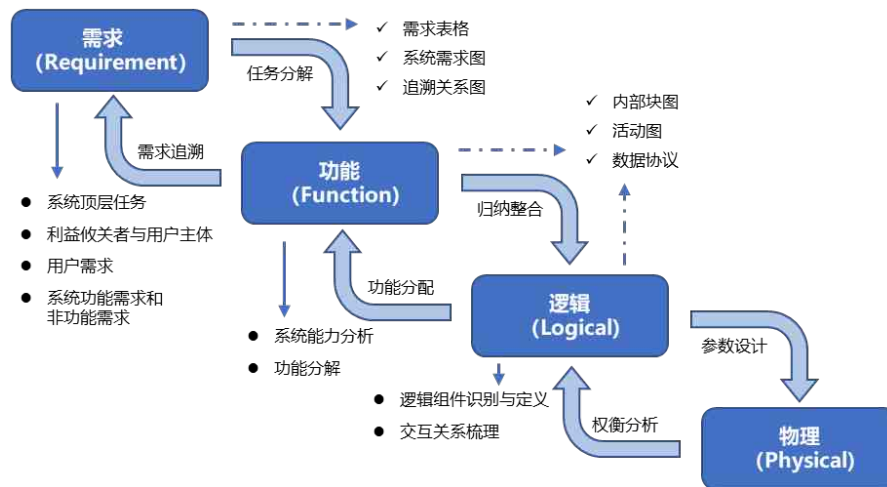
SysML Systems Modeling Language SysML

UML Unified Modeling Language

SysML Magic Systems of

Systems Architect

## 2.2.1.2 RFLP



2-4 RFLP

MBSE

1) Requirement

7S

2) Function



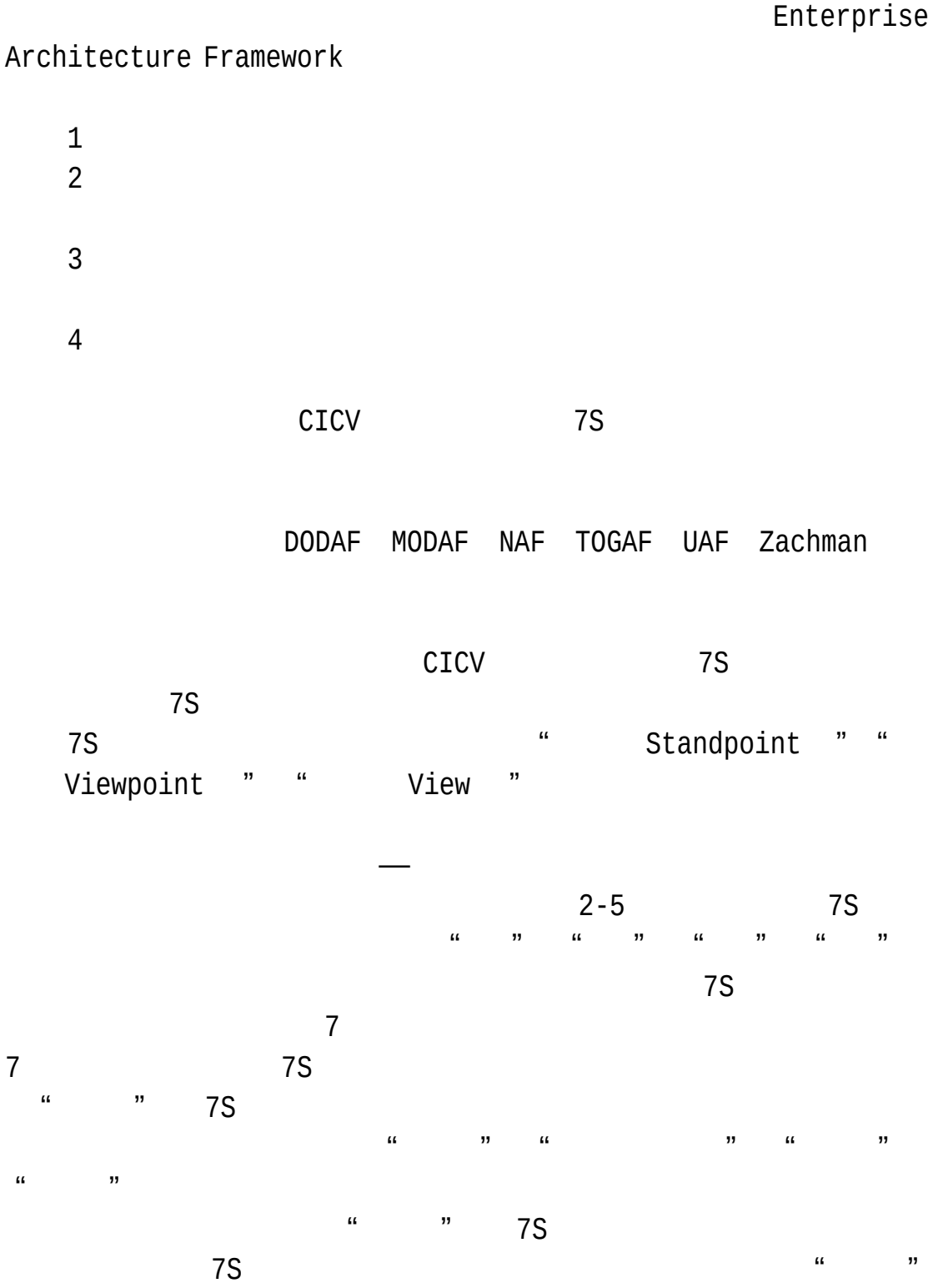
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3) Logical

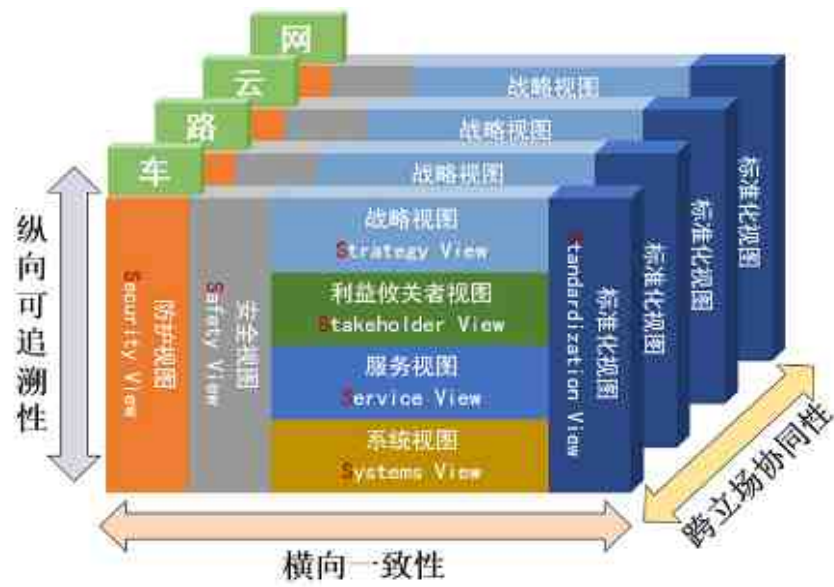
“ ”

4) Physical  
“ ”

### 2.2.2 7S



“ ”



2-5 7S

7S

2-6

7S

7S

7S

7S



2-6

7S

2.2.3

“ RFLP ”

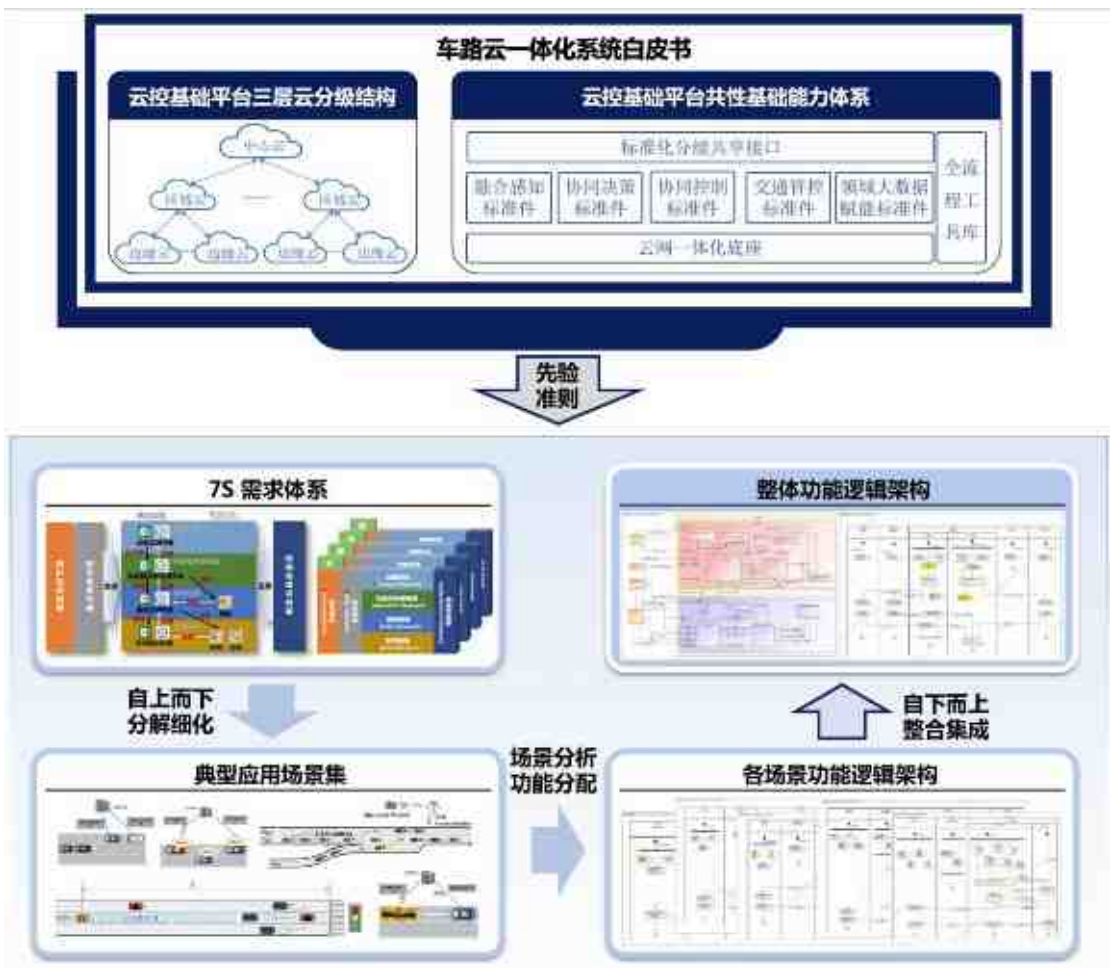
MBSE

1-2

“ 5+2+1 ”

“ ” “ ”

2-7



2-7

“ ”

“ 5+2+1 ”

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“ ” 7S

“ ”

“ ”

“ ”

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30

3

3.1

7S

- a.
- b.

- c.
- d.
- e.

SOA

3-1



3-1

- 
- a.
  - b.
  - c.
  - d.

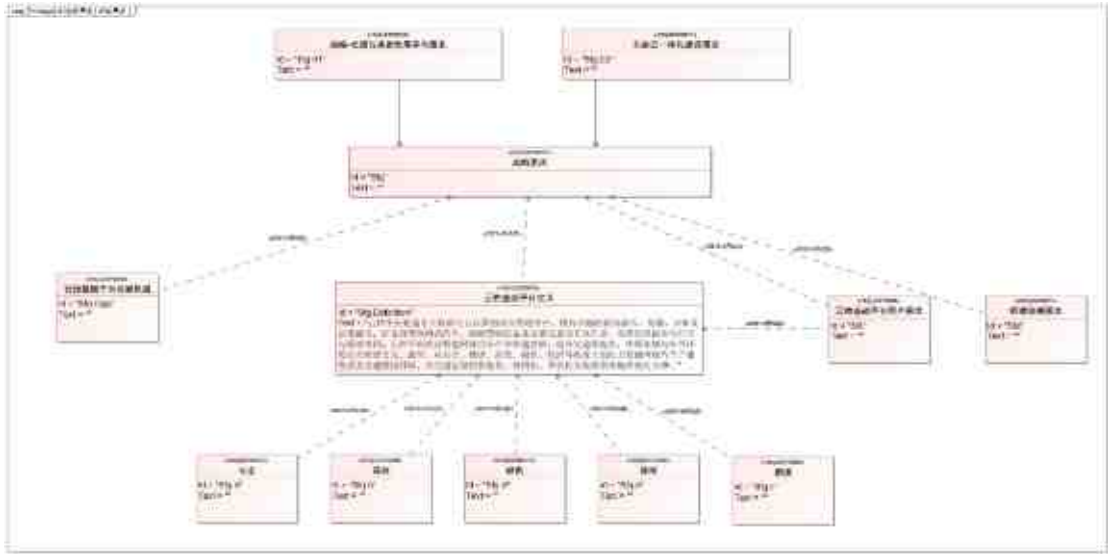
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3-1

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| Stg02.2 |   | 6  | A.1.4. -   |
| Stg02.3 | / | 11 | A.1.5. - / |
| Stg02.4 |   | 9  | A.1.6. -   |



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|---------|--|---|-------------|
| Stg02.5 |  | 4 | A.1.7.<br>- |
| Stg02.6 |  | 7 | A.1.8.<br>- |



3-2

3.1.2

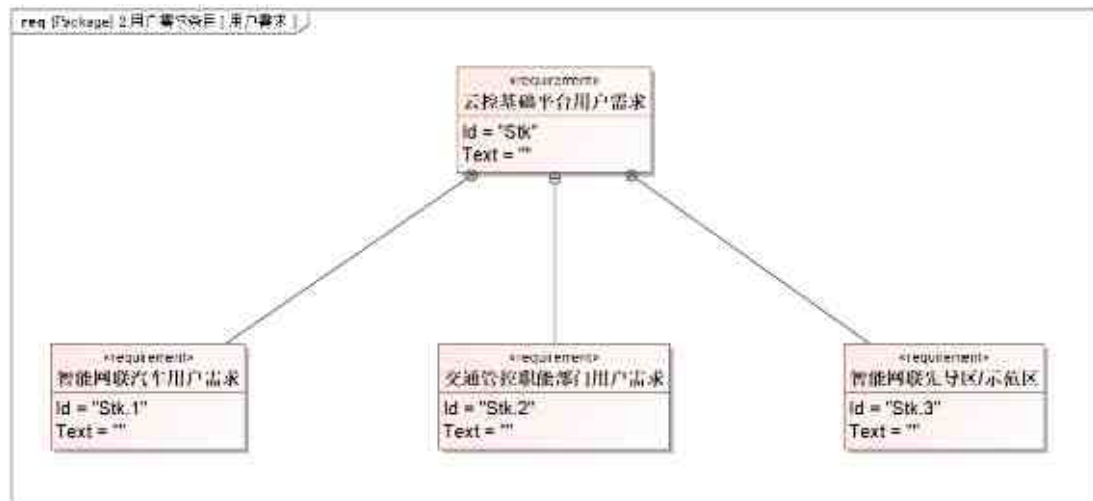
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| Stk1.2  |   | 15 | A.2. 1. 2<br>-      |
| Stk1.3  |   | 15 | A.2. 1. 3<br>-      |
| Stk1.4  |   | 25 | A.2. 1. 4<br>-      |
| Stk1.5  |   | 23 | A.2. 1. 5<br>-      |
| Stk1.6  |   | 23 | A.2. 1. 6<br>-      |
| Stk1.7  |   | 19 | A.2. 1. 7<br>-      |
| Stk1.8  | - | 16 | A.2. 1. 8<br>-<br>- |
| Stk1.9  | - | 8  | A.2. 1. 9<br>-<br>- |
| Stk1.10 | - | 10 | A.2. 1. 10          |

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|             |  |    | -               |
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| Stk1.12     |  | 19 | A.2. 1. 12<br>- |
|             |  |    |                 |
| Stk1.13     |  | 14 | A.2. 1. 13<br>- |
|             |  |    |                 |
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|             |  |    |                 |
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|-------------|----------|----|------------------|
| Stk2.6      |          | 10 | A.2. 2. 6<br>-   |
| Stk2.7      |          | 12 | A.2. 2. 7<br>-   |
| Stk2.8      |          | 9  | A.2. 2. 8<br>-   |
| Stk2.9      |          | 11 | A.2. 2. 9<br>-   |
| Stk2.10     |          | 10 | A.2. 2. 10<br>-  |
| Stk2.11     |          | 5  | A.2. 2. 11<br>-  |
| Stk2.12     |          | 10 | A.2. 2. 12<br>-  |
| Stk2.13     |          | 14 | A.2. 2. 13<br>-  |
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|---------|--|----|-------------------|
|         |  |    |                   |
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| Stk3.8  |  | 11 | A.2. 3. 8<br>/ -  |
| Stk3.9  |  | 8  | A.2. 3. 9<br>/ -  |
| Stk3.10 |  | 10 | A.2. 3. 10<br>/ - |
| Stk3.11 |  | 10 | A.2. 3. 11<br>/ - |



3-3

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### 3.1.3

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3-3

13

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3-3

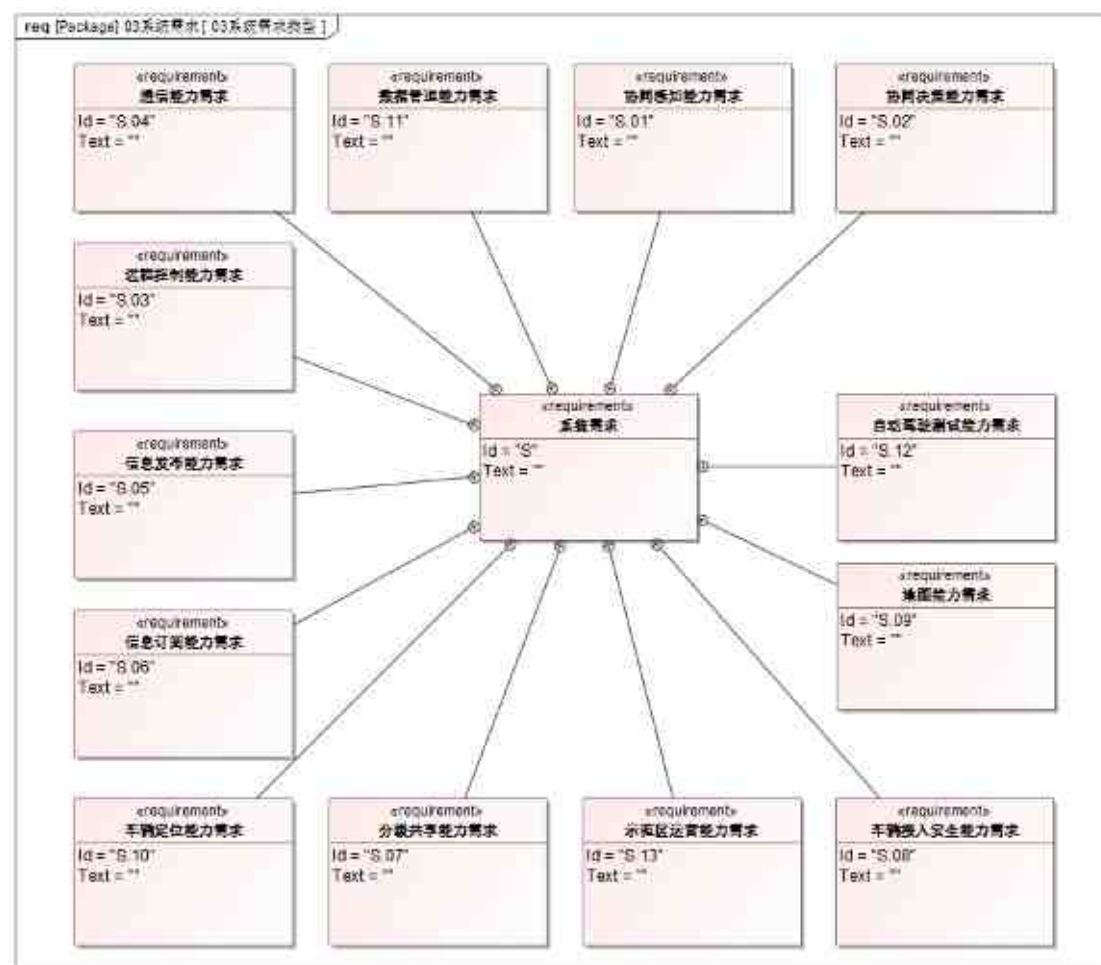
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| <b>S5</b> |  |    | <b>A.3.5</b><br>-   |
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| <b>S7</b> |  |    |                     |
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| S7.2      |  | 5  | <b>A.3.7.2</b><br>- |
| S7.3      |  | 2  | <b>A.3.7.3</b><br>- |
| <b>S8</b> |  |    | <b>A.3.8</b>        |



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| S8.1       |  | 6  |        |
| <b>S9</b>  |  |    | A.3.9  |
| S9.1       |  | 8  | -      |
| <b>S10</b> |  |    | A.3.10 |
|            |  |    | -      |
| S10.1      |  | 3  |        |
| <b>S11</b> |  |    | A.3.11 |
|            |  |    | -      |
| S11.1      |  | 3  |        |
| S11.2      |  | 6  |        |
| S11.3      |  | 7  |        |
| <b>S12</b> |  |    | A.3.12 |
|            |  |    | -      |
| S12.1      |  | 5  |        |
| <b>S13</b> |  |    | A.3.13 |
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| S13.1      |  | 12 |        |



3-4

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### 3.1.4

8                      127

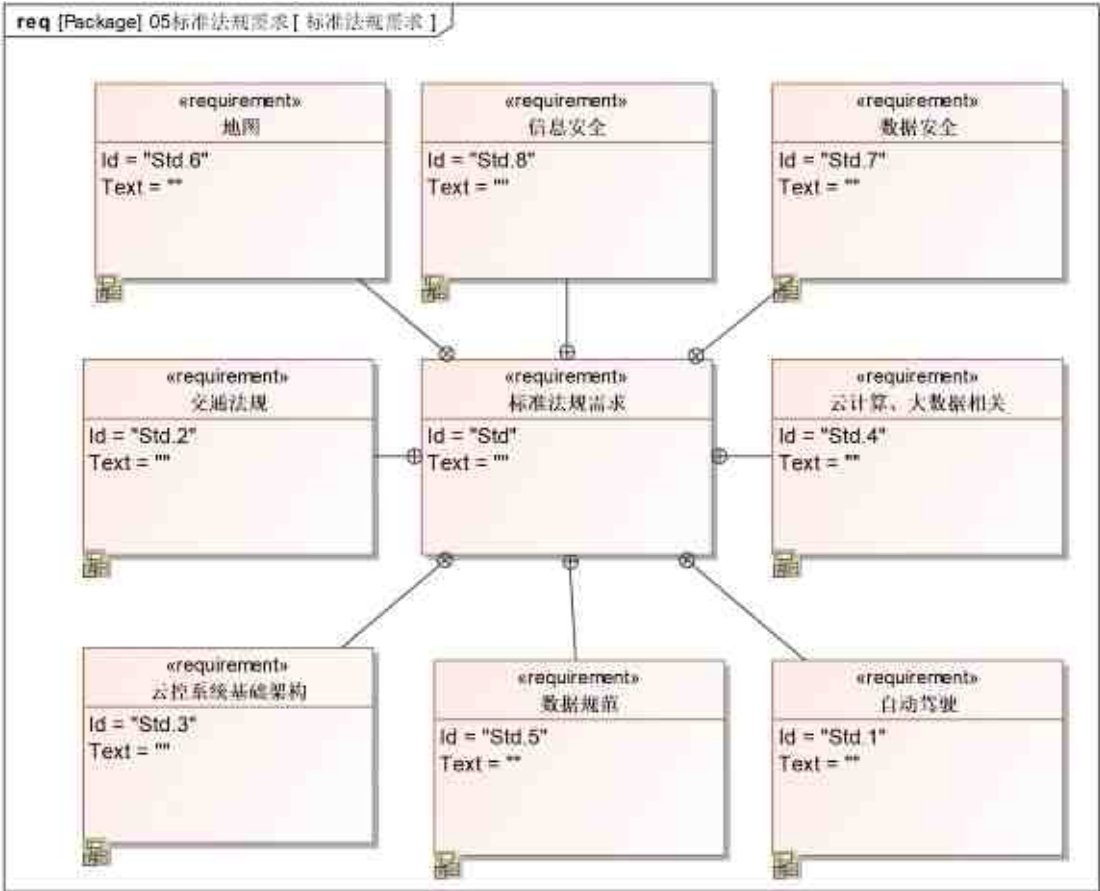
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| Std.7 |  | 4  | A.4.7<br>- |
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3-5

3.1.5

C-AVP

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| ID    |  |       |
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| Snr.1 |  |       |

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| Snr .2 |  |     |
| Snr .3 |  |     |
| Snr .4 |  | /   |
|        |  | RSU |
| Snr .5 |  |     |
| Snr .6 |  | HMI |
|        |  | HMI |
| Snr .7 |  |     |

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|---------|--|--|
|         |  |  |
| Snr .8  |  |  |
| Snr .9  |  |  |
| Snr .10 |  |  |
| Snr .11 |  |  |
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| Snr .14 |  |  |
| Snr .15 |  |  |

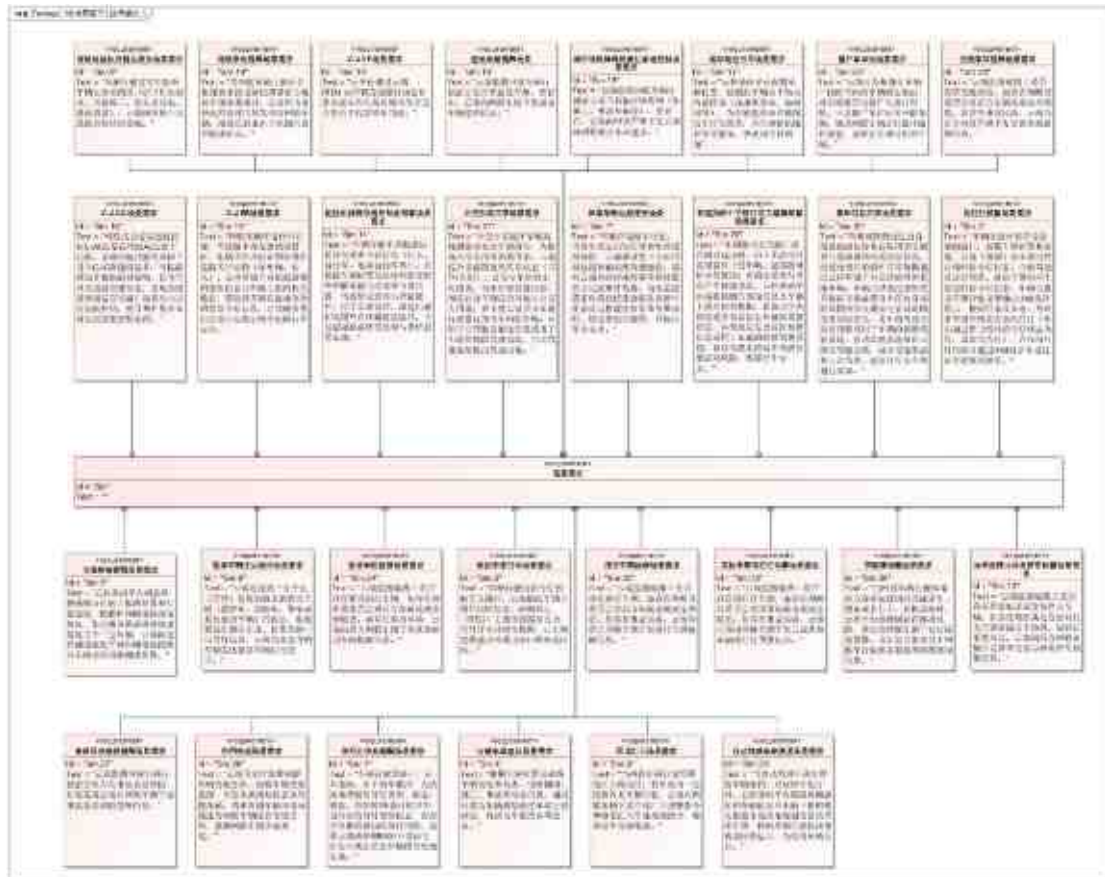
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| Snr .18 |       |  |
| Snr .19 |       |  |
| Snr .20 |       |  |
| Snr .21 |       |  |
| Snr .22 | C-AEB |  |

|         |       |                        |
|---------|-------|------------------------|
|         |       |                        |
| Snr .23 | C-ACC | C-ACC ACC<br>C-<br>V2X |
| Snr .24 | C-AVP | /RSU                   |
| Snr .25 |       |                        |
| Snr .26 |       |                        |
| Snr .27 |       |                        |
| Snr .28 |       |                        |
| Snr .29 |       | RSU                    |
| Snr .30 |       | /                      |



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### 3.1.6

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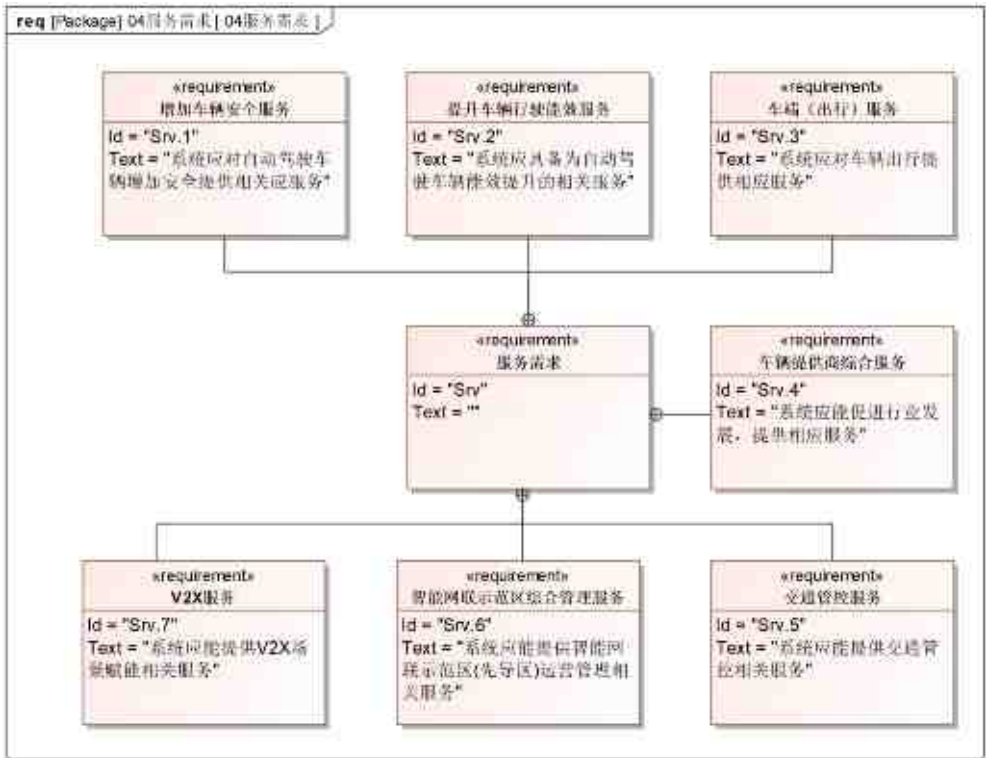
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3-6

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3-6

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| Srv.4 |     | 12 | A.6.4<br>-    |
| Srv.5 |     | 13 | A.6.5<br>-    |
| Srv.6 |     | 14 | A.6.6<br>-    |
| Srv.7 | V2X | 37 | A.6.7<br>-V2X |



3-7

### 3.1.7

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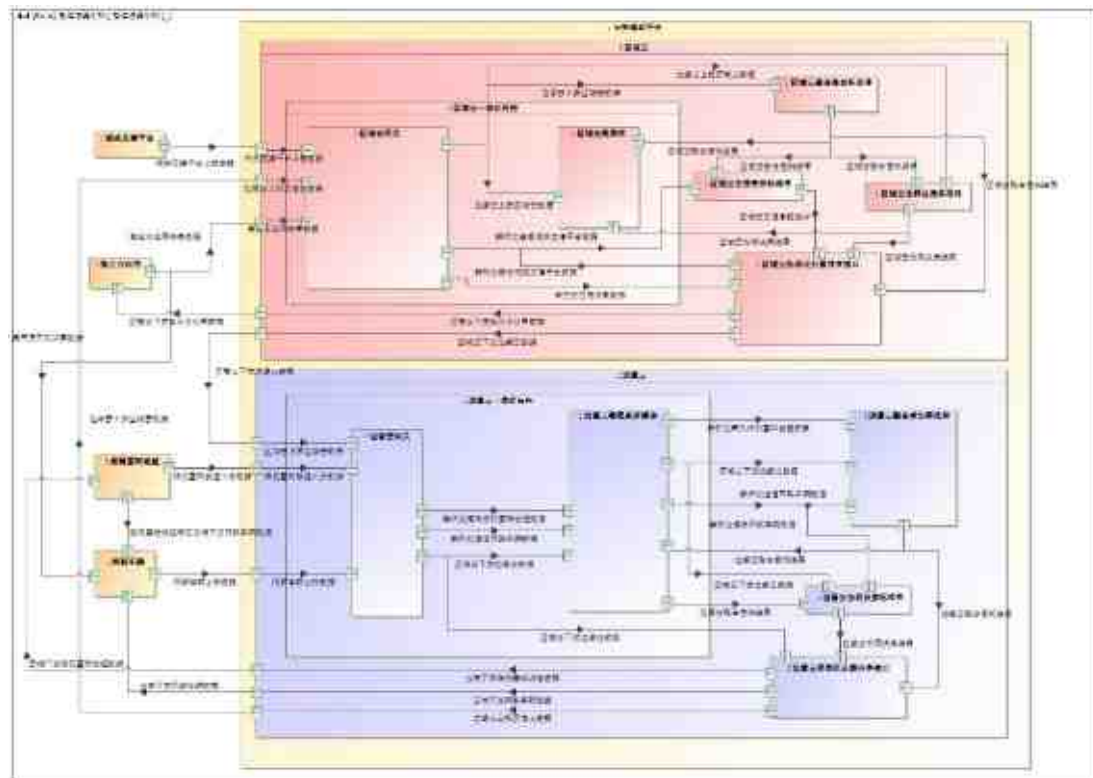
3-7

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| 3 | - | A.7.3 | - |

## 3.2

### 3.2.1

3-8

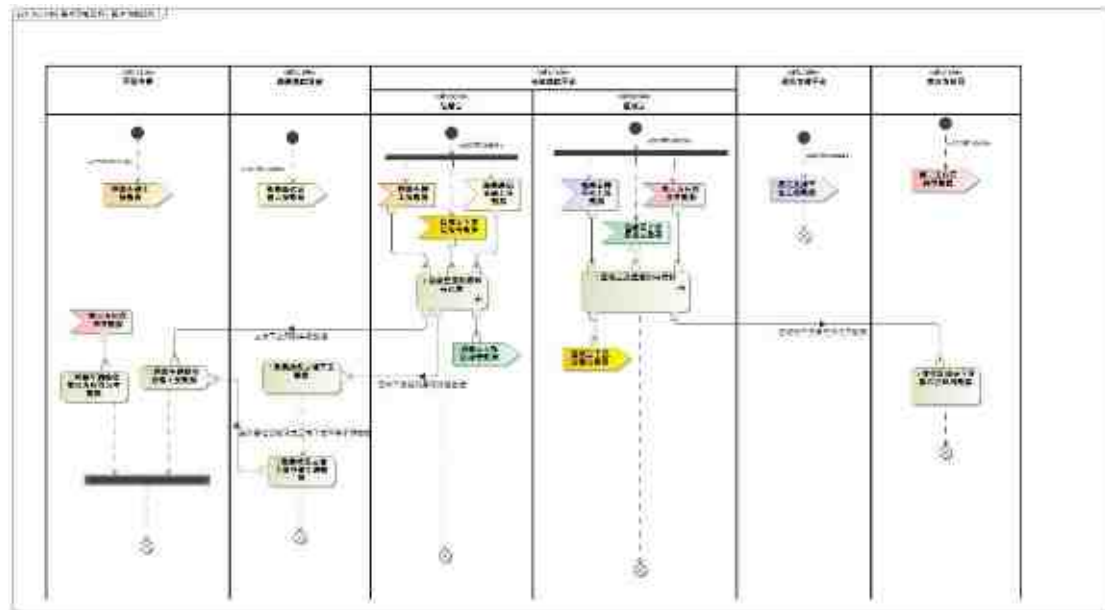


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### 3.2.2

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### 3.2.3

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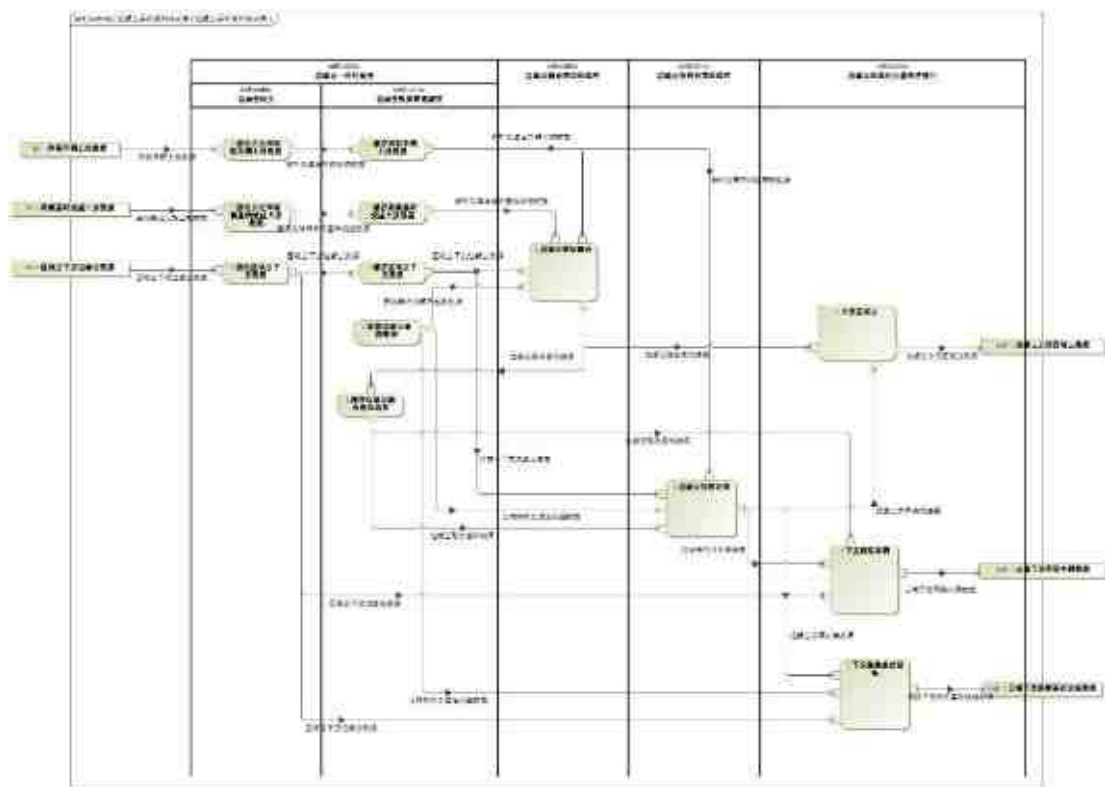
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### 3.2.4

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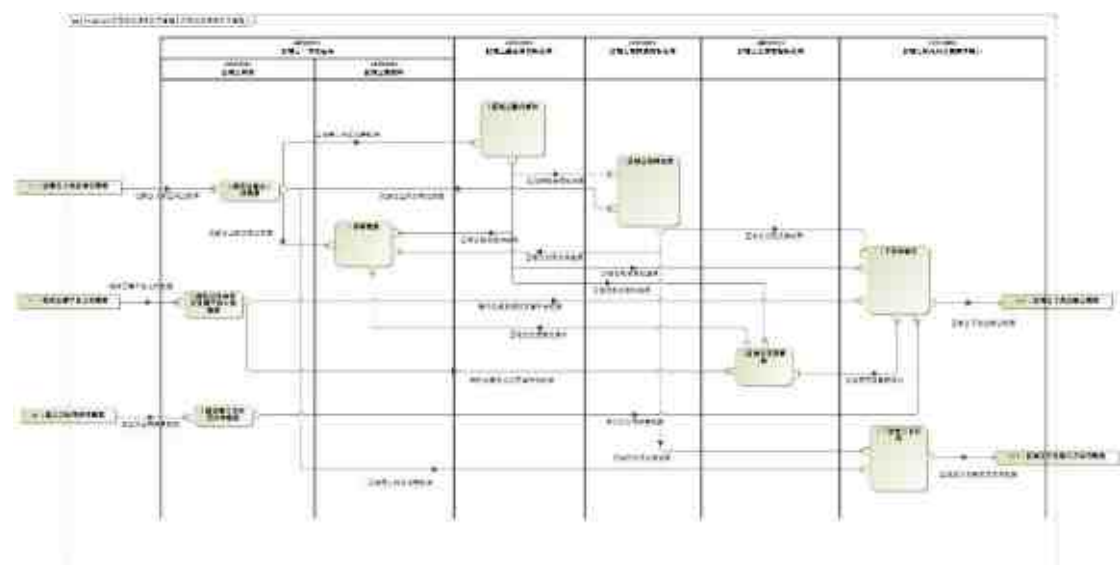
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3-11

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” T/CSAE 259.2-2023 2  
“ ” T/CSAE  
259.3-2023 3  
“ ”  
V1.2)

| 3-8 |     |               |
|-----|-----|---------------|
|     |     | /             |
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|     |     | 8.2.4.3       |
|     |     | 8.2.4.2 GNSS  |
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|     |     | 8.2.4.3       |
|     |     | 8.2.4.4       |
|     |     | B.2.1         |
|     |     | B.3.1         |
|     |     | 9.2 35        |
|     |     | 9.1 30        |
|     |     | 9.1 30        |
|     |     | 8.11          |
|     |     | 8.13.3 29     |
|     |     | 8.11          |
|     | AVP | 8.5.15.3.1 46 |
|     |     | 47            |
|     |     | - V8          |
|     |     | A.9.1.1 A.26  |
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|     |     | B.4.3         |
|     |     | B.4.4         |
|     |     | B.4.5         |
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|     |     | B.4.7         |
|     |     |               |
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|  |     |               |
|--|-----|---------------|
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|  |     | - V8 A.9.1.3  |
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|  |     | - V8 A.6 A.21 |
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|  |     | 47            |
|  | ACC | 8.5.15.3.1 46 |
|  |     | 47            |
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|  |     | B.5.19        |
|  |     | B.5.20        |
|  |     | B.5.21        |
|  |     | B.5.22        |
|  |     | B.5.23        |
|  |     | B.6.1         |
|  | POI | B.6.2         |
|  |     | B.7.1         |
|  |     | B.7.2         |

|  |  |               |
|--|--|---------------|
|  |  | /             |
|  |  | B.7.3         |
|  |  | B.7.4         |
|  |  | B.8.1         |
|  |  | 8.5.14.3.3 45 |
|  |  | 8.5.14.3.3 45 |
|  |  | 8.5.6.3.2 27  |
|  |  | 8.5.14.3.3 45 |
|  |  | 8.5.11.3.2 37 |
|  |  | 8.5.13.3.2 41 |
|  |  | 8.5.14.3.3 45 |
|  |  | 8.5.14.3.3 45 |
|  |  | 8.5.14.3.3 45 |
|  |  | 8.5.12.3.2 39 |
|  |  | 8.5.8.3.2 31  |
|  |  | 8.5.14.3.3 45 |
|  |  | 8.5.14.3.3 45 |
|  |  | 8.7.4.1 53    |
|  |  | 8.5.14.3.3 45 |
|  |  | 8.5.14.3.3 45 |

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4

4.1

“

”

30

30

C-

AEB C-ACC

C-AVP

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## 4.2

/

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## 4.3

### 4.3.1

### 4.3.2

### 4.3.3

### 4.3.4

1

2

### 4.3.5

L3

HMI

L4

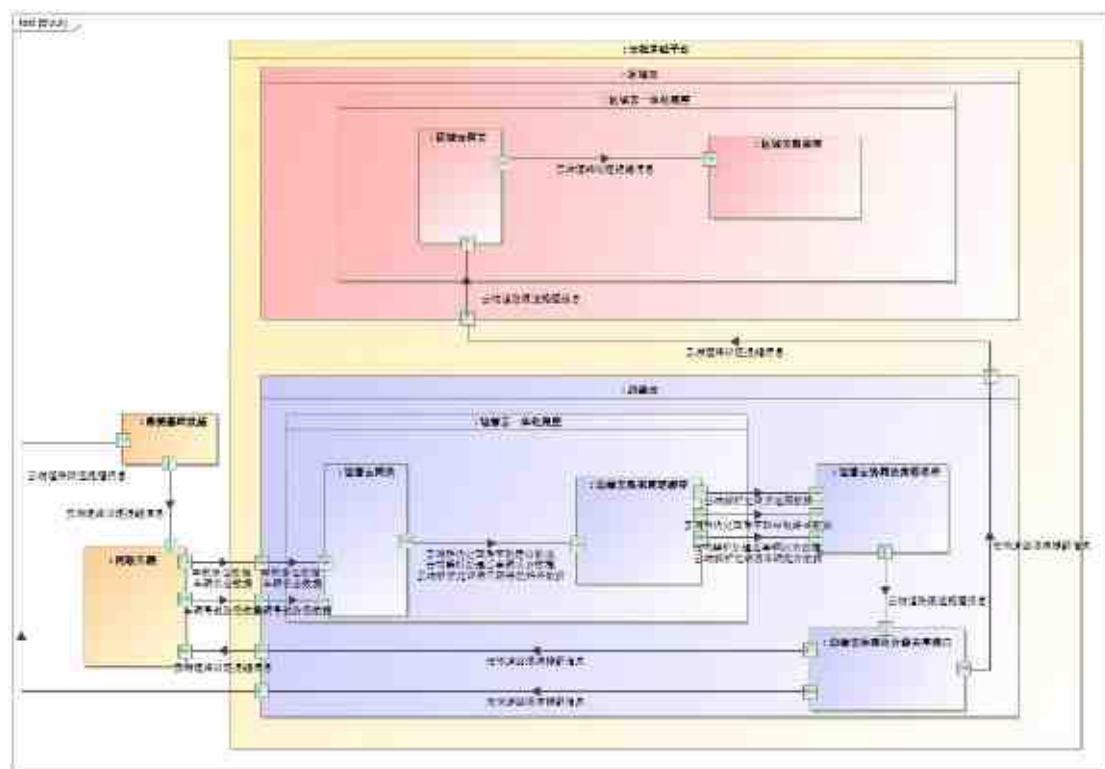
### 4.3.6

/

### 4.3.7

1

4-1

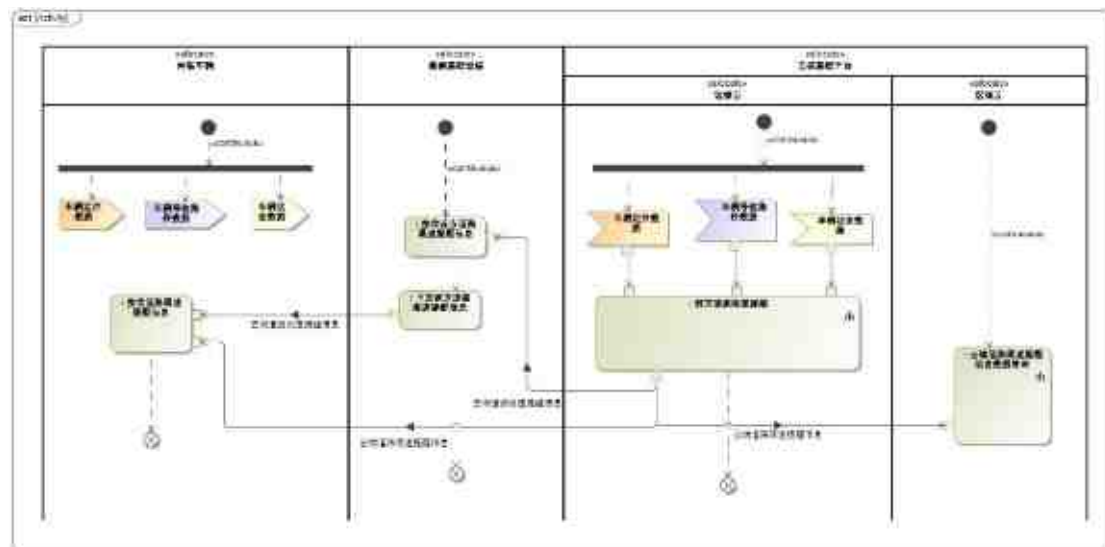


4-1

4-1

2

4-2



4-2

1.

2.

3.

3 “

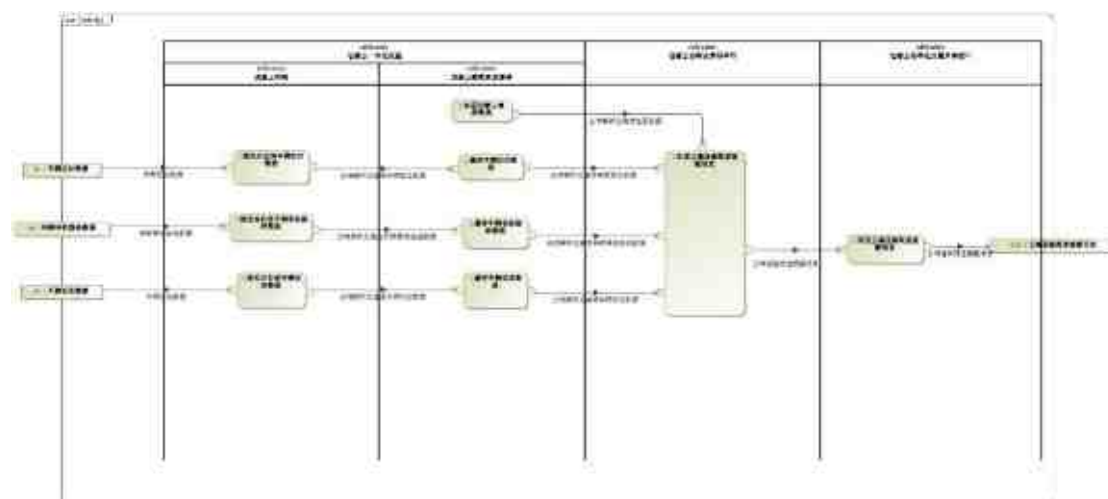
4-3

”

“

”





4-3

“ ”

1.

2.

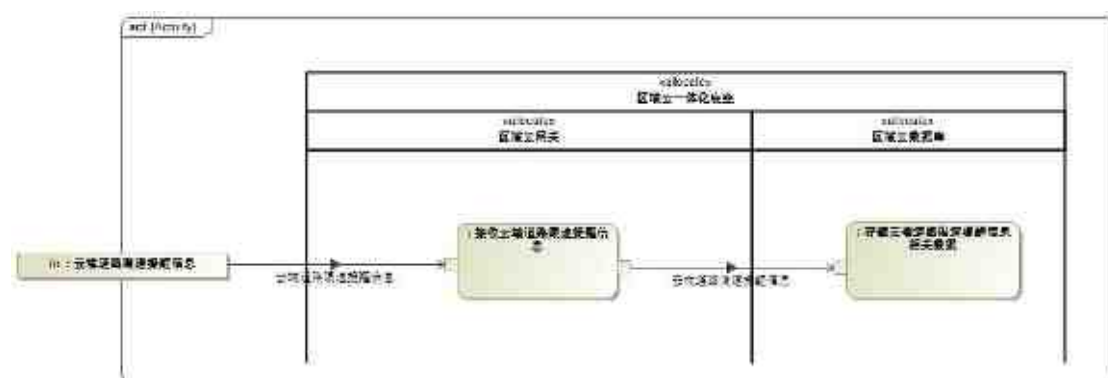
3.

4 “ ”

4-4

“

”



4-4

“ ”

1.

2.

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## 4.4

### 4.4.1

### 4.4.2

### 4.4.3

### 4.4.4

1

2

### 4.4.5

L3

HMI

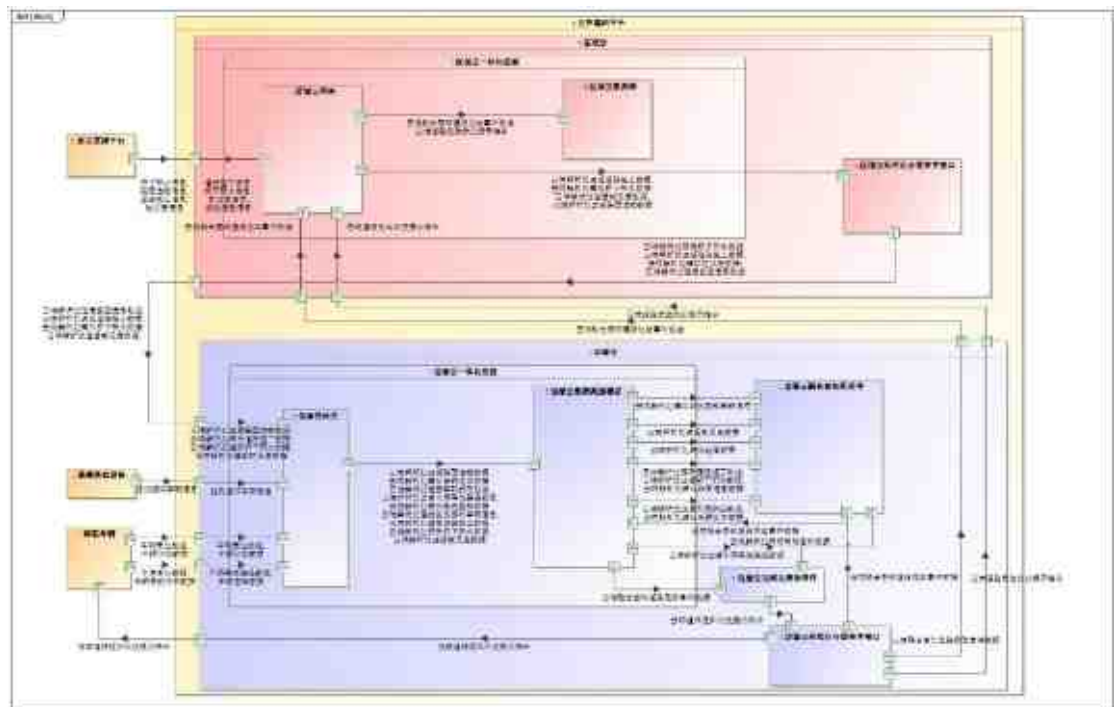
L4

### 4.4.6        /

#### 4.4.7

1

4-5

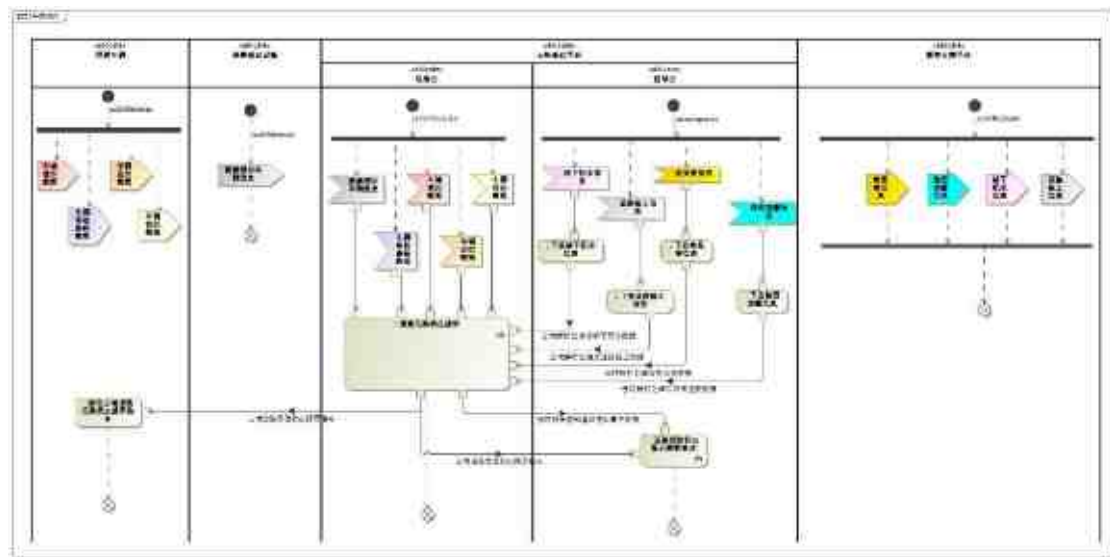


4-5

4-5

2

4-6



4-6

1.

2.

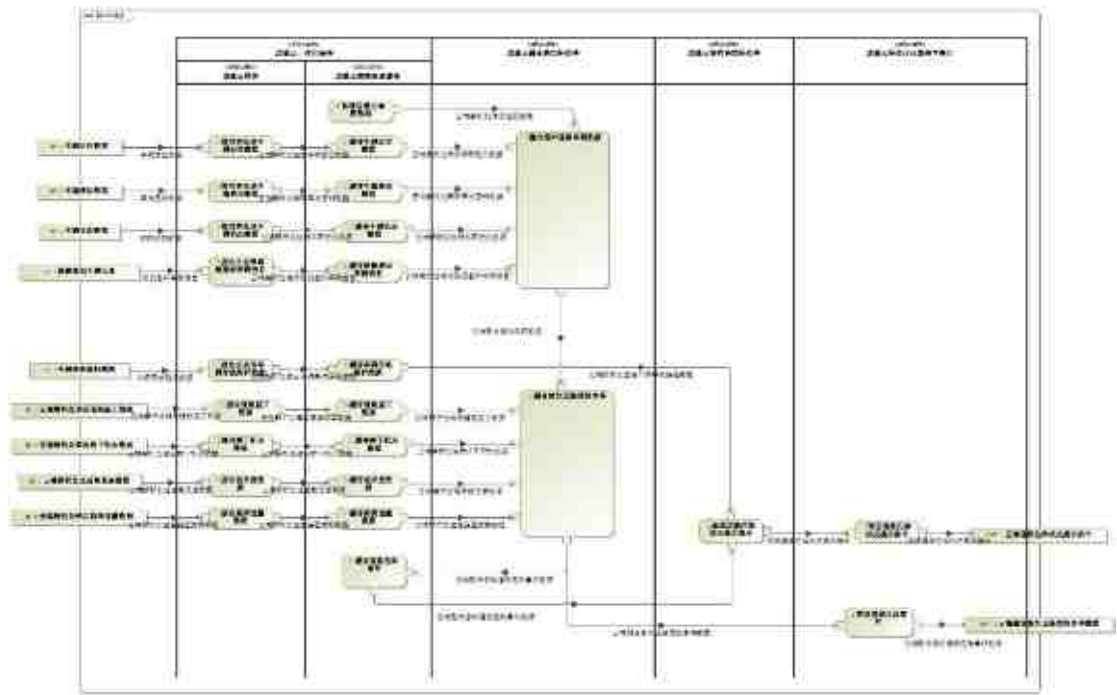
3.

3 “ ”

4-7

“

”



4-7

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“ ”

1.

2.

3.

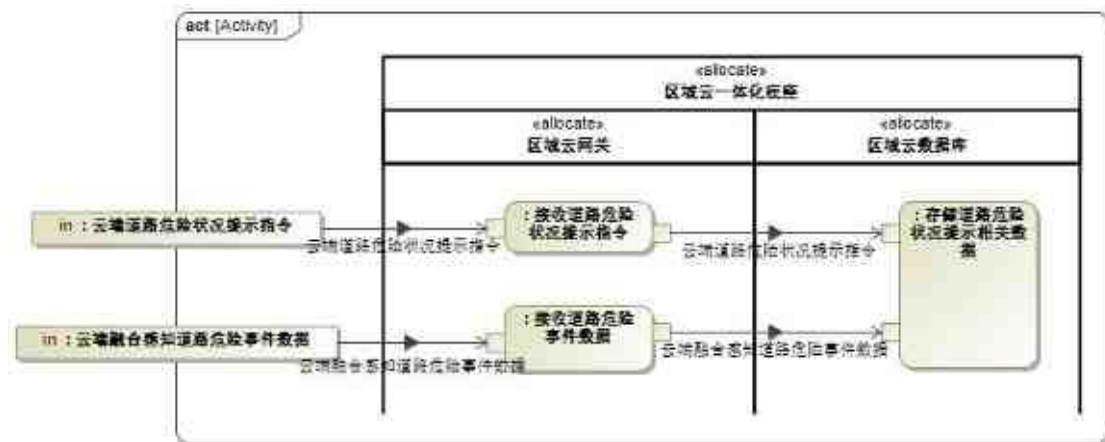
4.

4 “ ”

4-8

“

”



4-8

“

”

1.

2.

## 4.5

### 4.5.1

### 4.5.2

### 4.5.3

### 4.5.4

1

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2

#### 4.5.5

L3

HMI

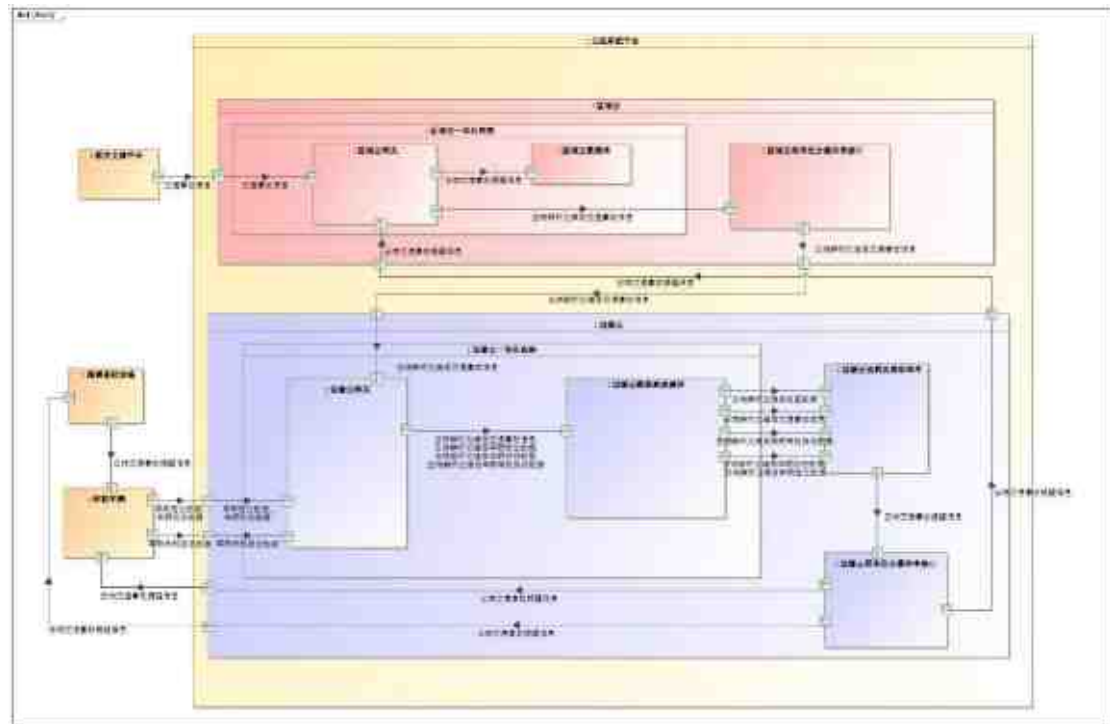
L4

#### 4.5.6 /

#### 4.5.7

1

4-9

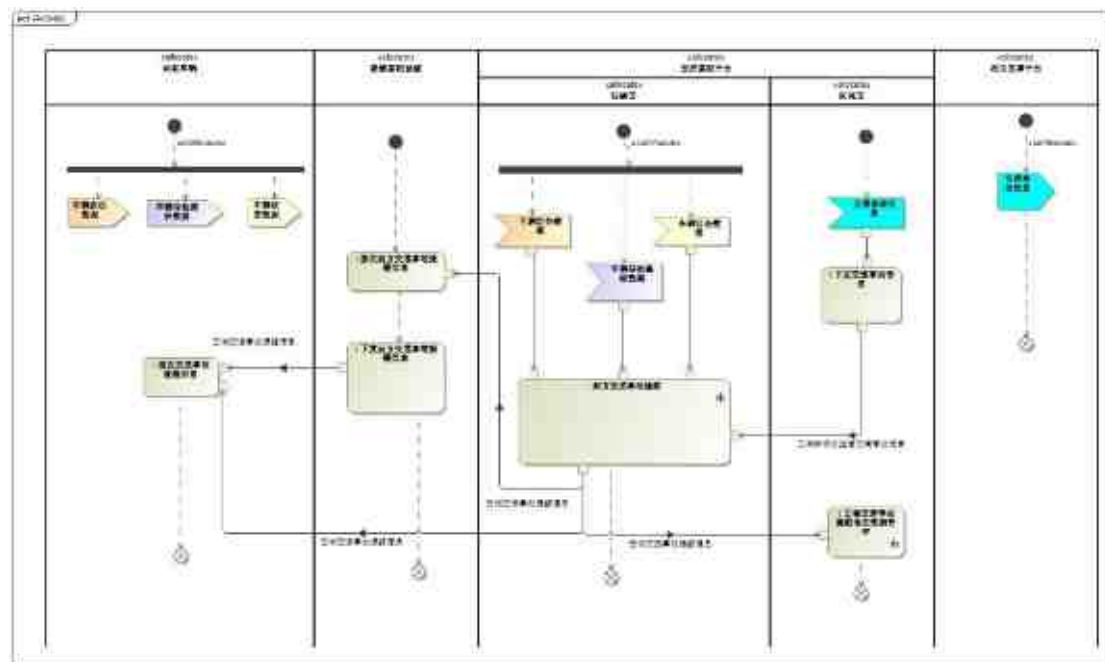


4-9

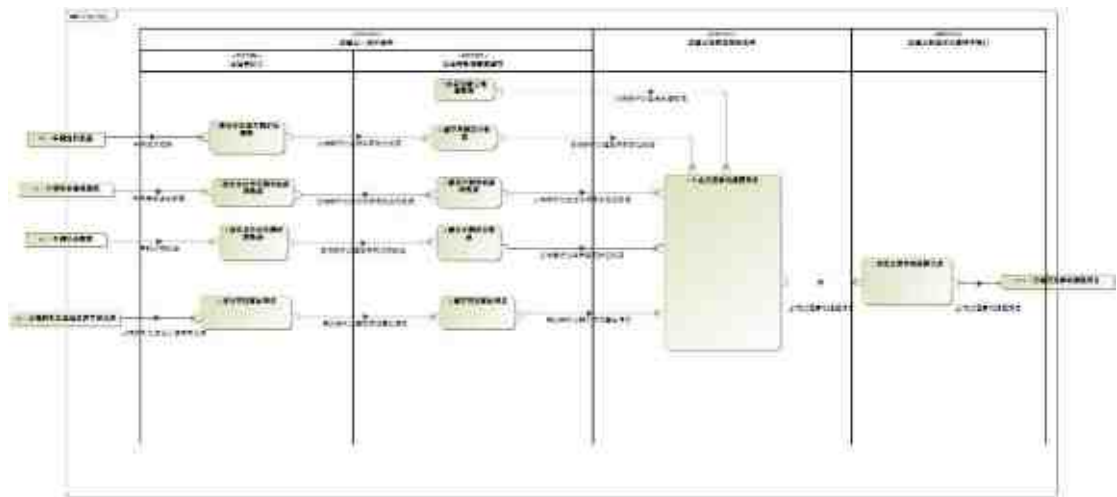
2

4-10





- 1.
- 2.
- 3.
- 3



4-11

“ ”

1.

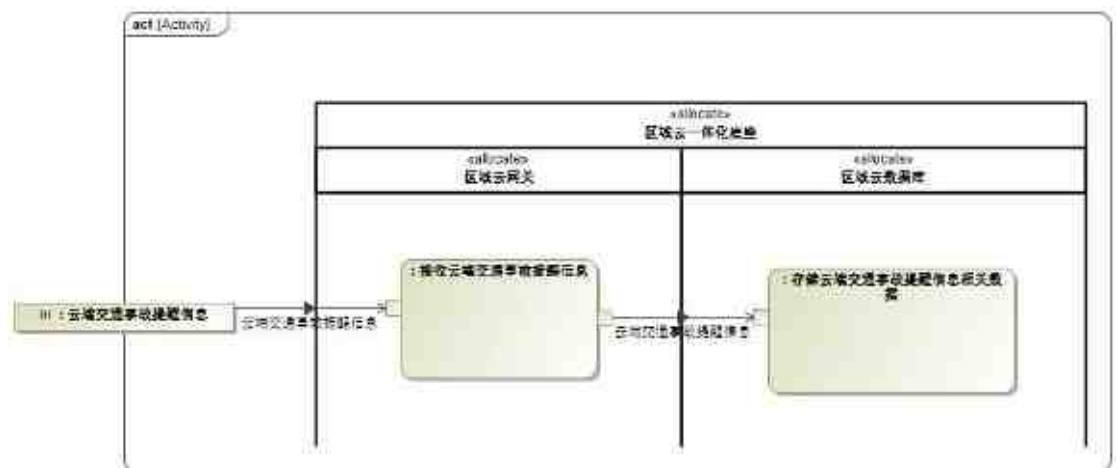
2.

3.

4

4-12

”



4-12

“ ”

1.

2.

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## 4.6

### 4.6.1

/

RSU

### 4.6.2

### 4.6.3

### 4.6.4

1

2

3

4

### 4.6.5

L3

HMI

HMI

L4

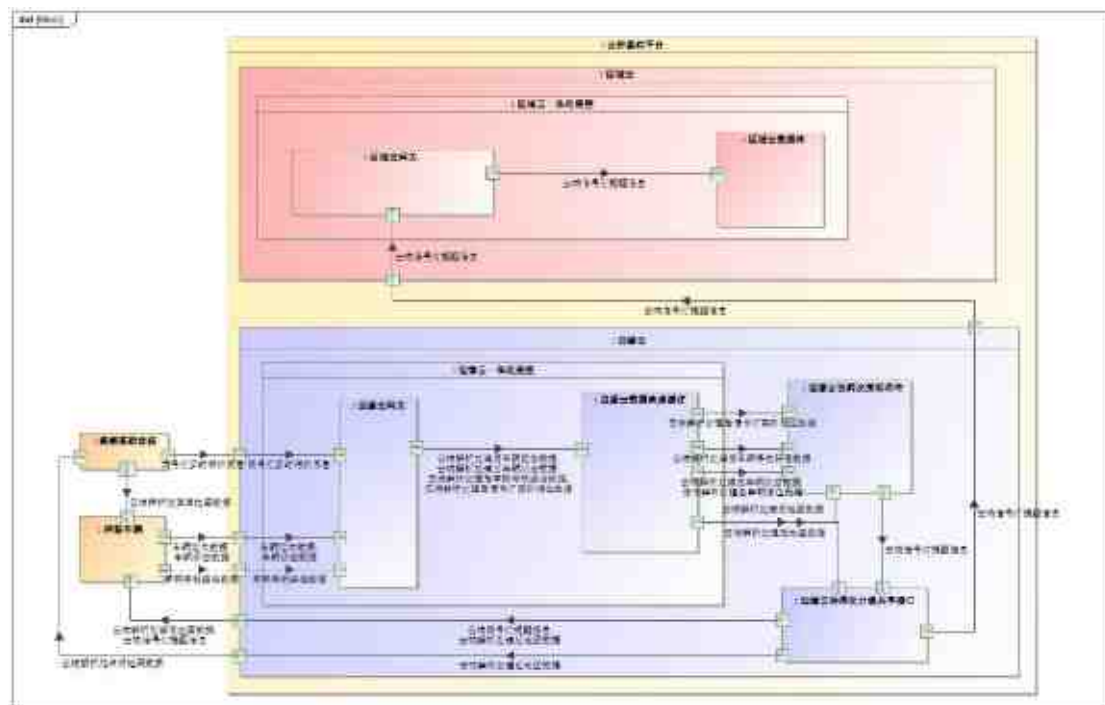
### 4.6.6

/

## 4.6.7

1

4-13

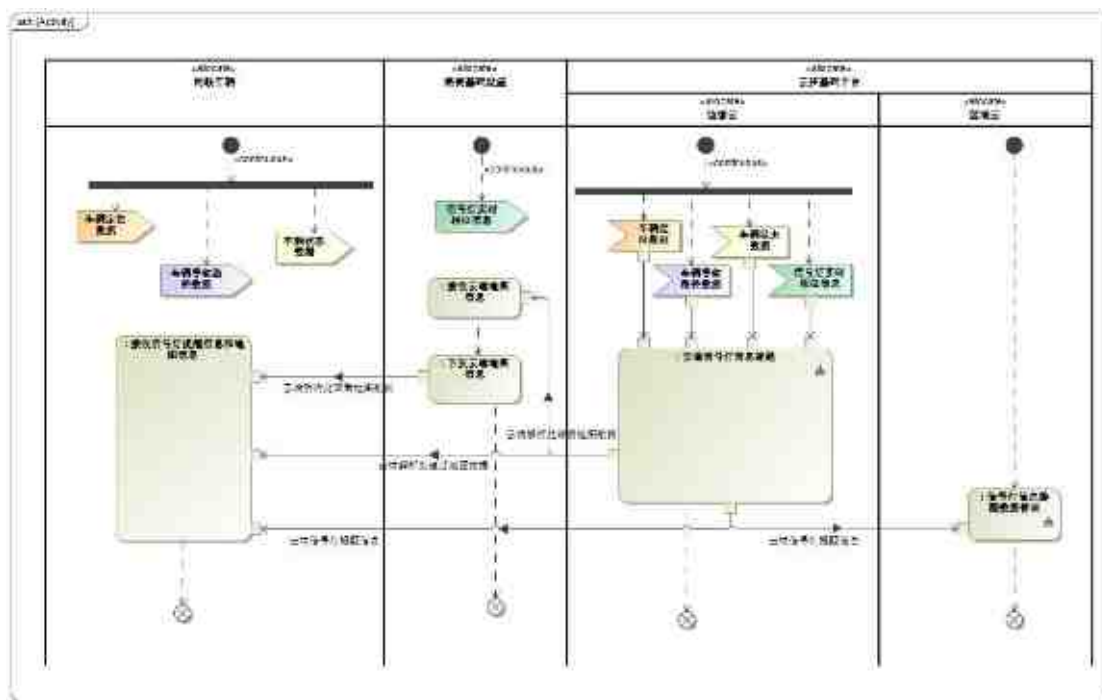


4-13

4-13

2

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4-14

1.

2.

3.

4.

3

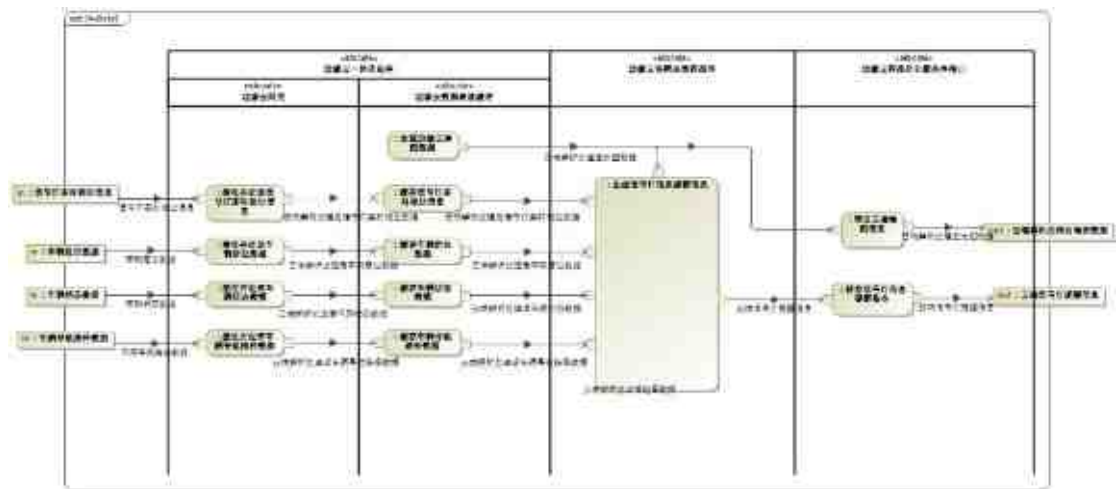
“

"

4-15

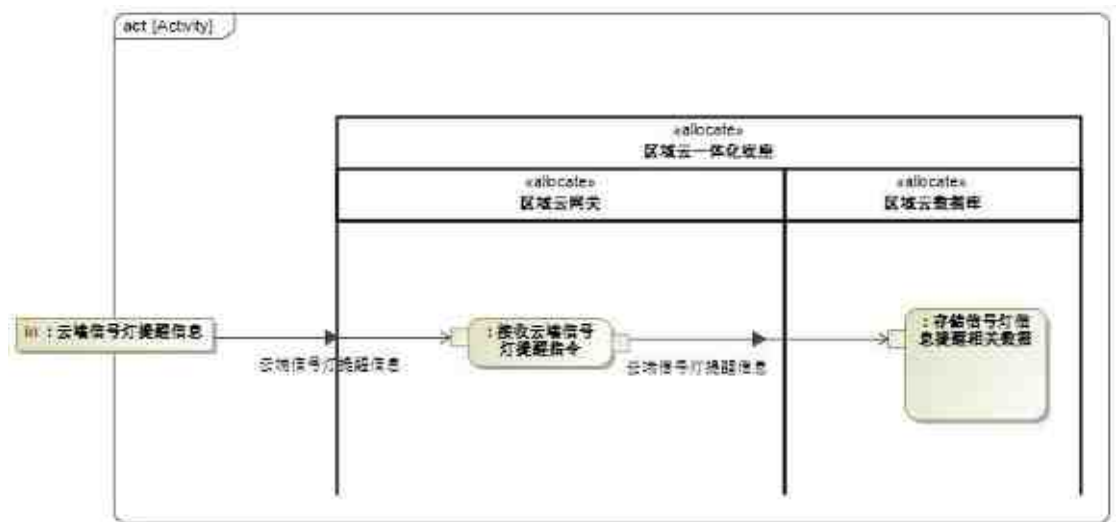
“

22



4-15

- “
- 1.
  - 2.
  - 3.
  - 4 “
- 4-16 “
- ”



4-16

- 
- “ ”
- 1.
  - 2.

## **4.7**

### **4.7.1**

### **4.7.2**

### **4.7.3**

### **4.7.4**

1

2

### **4.7.5**

L3

HMI

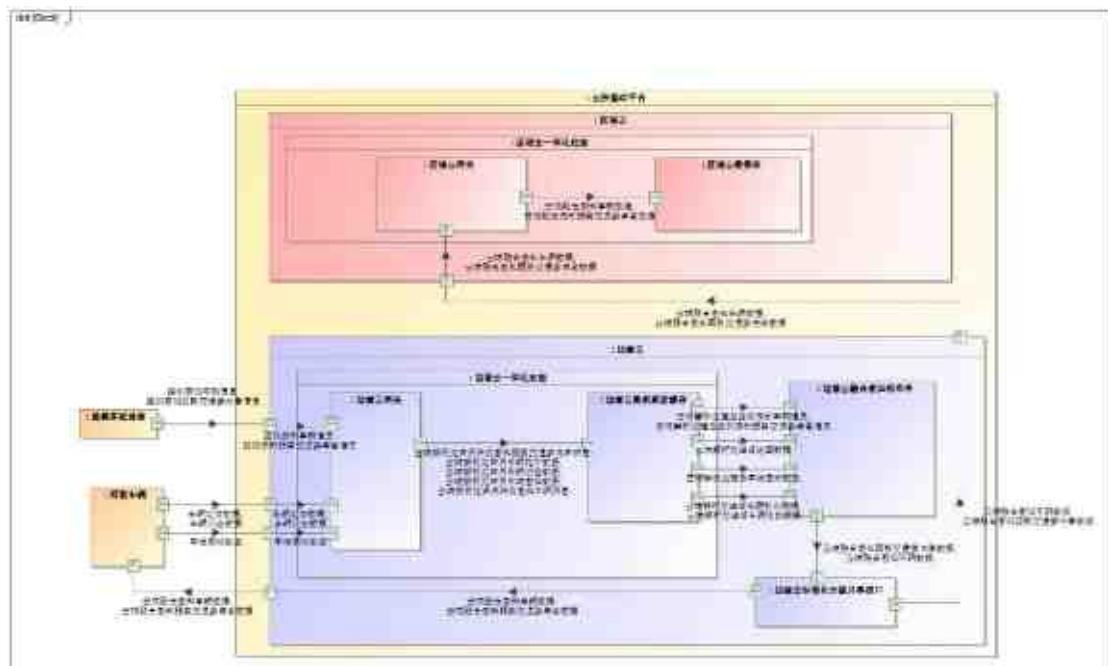
L4

4.7.6 /

4.7.7

1

4-17



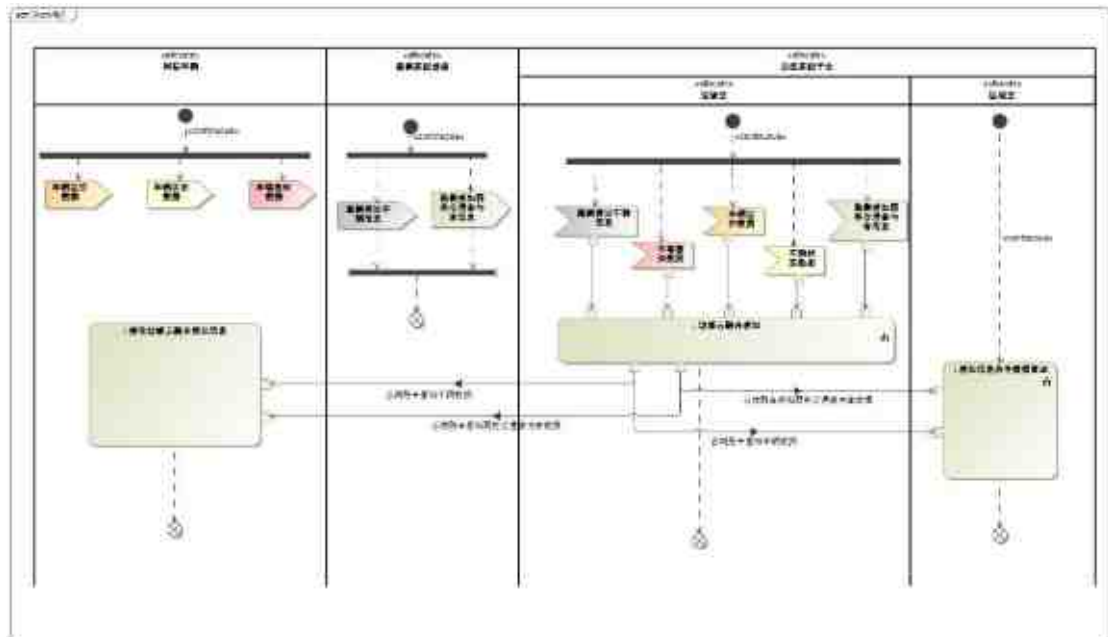
4-17

4-17



2

4-18



4-18

1.

2.

3.

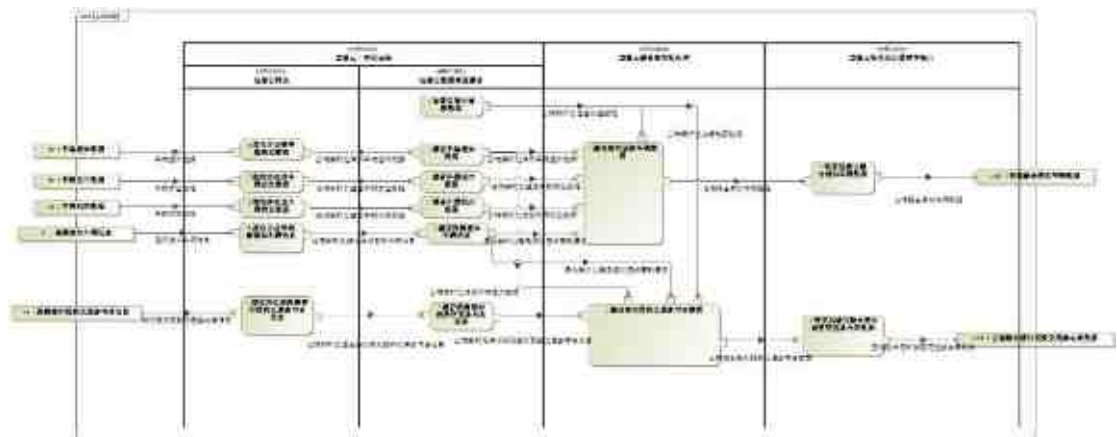
4.

3 “ ”

4-19

“

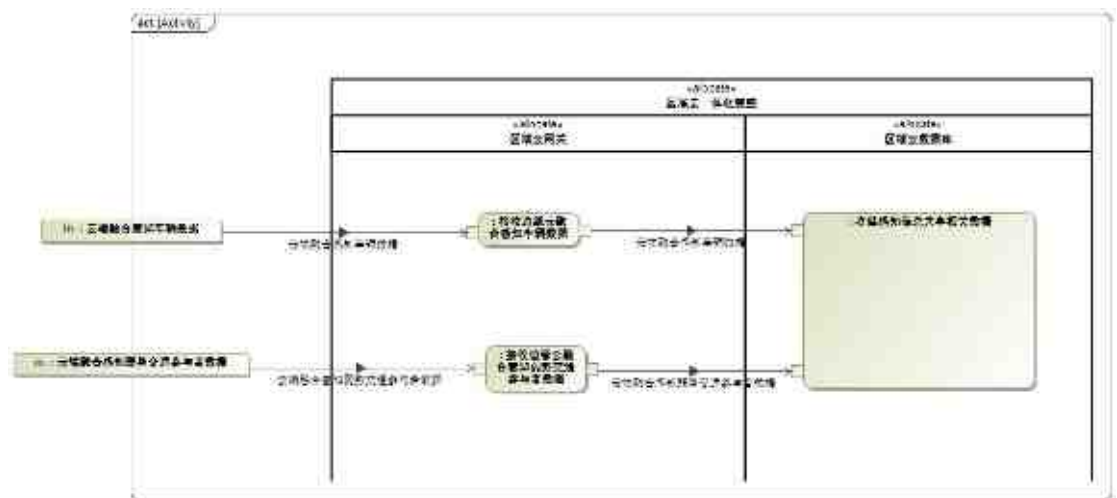
”



4-19

- “ ”
- 1.
  - 2.
  - 3.
  - 4 “ ”
- 4-20

“ ”



4-20

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|       |     |
|-------|-----|
| “ ”   |     |
| 1.    |     |
| 2.    |     |
| 4.8   |     |
| 4.8.1 |     |
|       | HMI |
|       | HMI |
| 4.8.2 |     |
| 4.8.3 |     |
| 4.8.4 |     |
| 1     |     |
| 2     |     |
| 3     |     |
| 4     |     |

## 4.8.5

L3

HMI

HMI

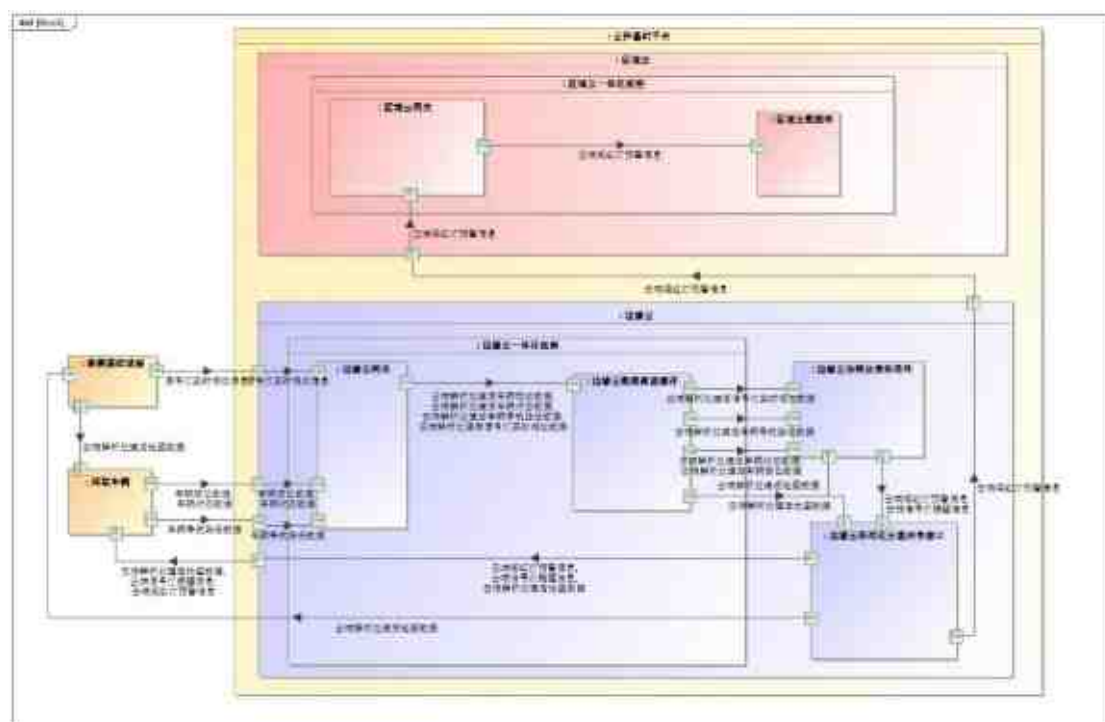
L4

## 4.8.6 /

## 4.8.7

1

4-21

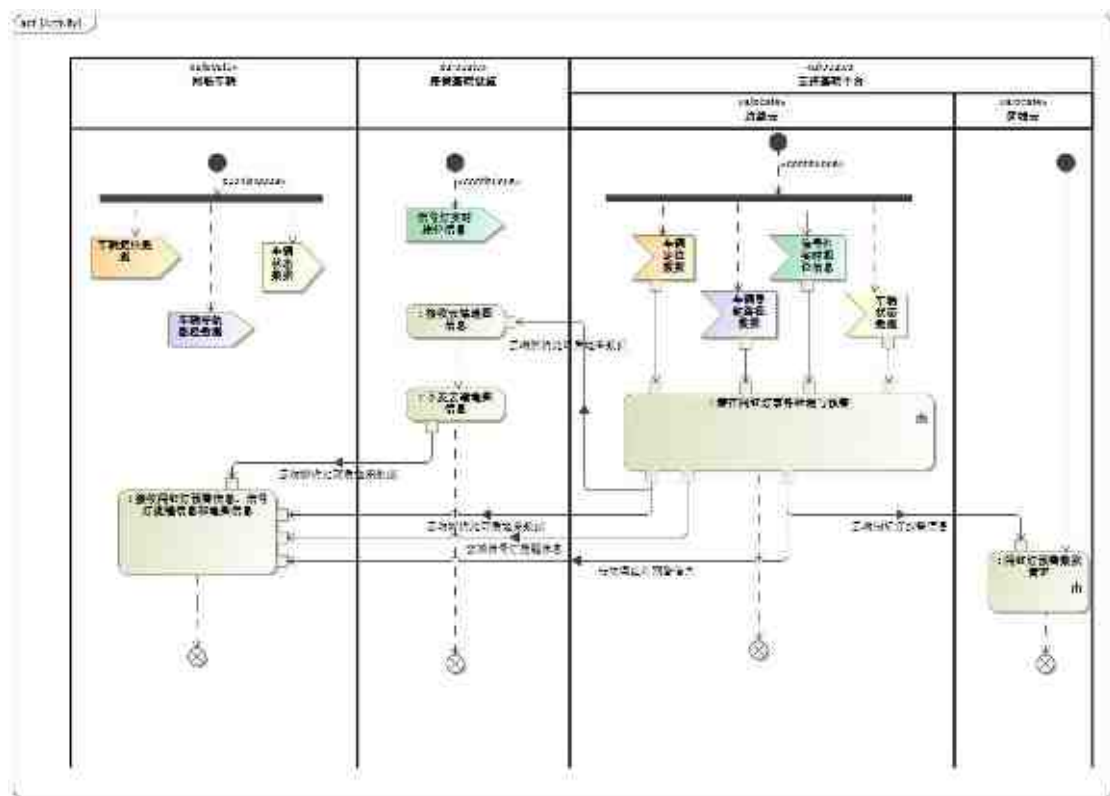


4-21

4-21

2

4-22



4-22

1.

2.

3.

4.

5.

3

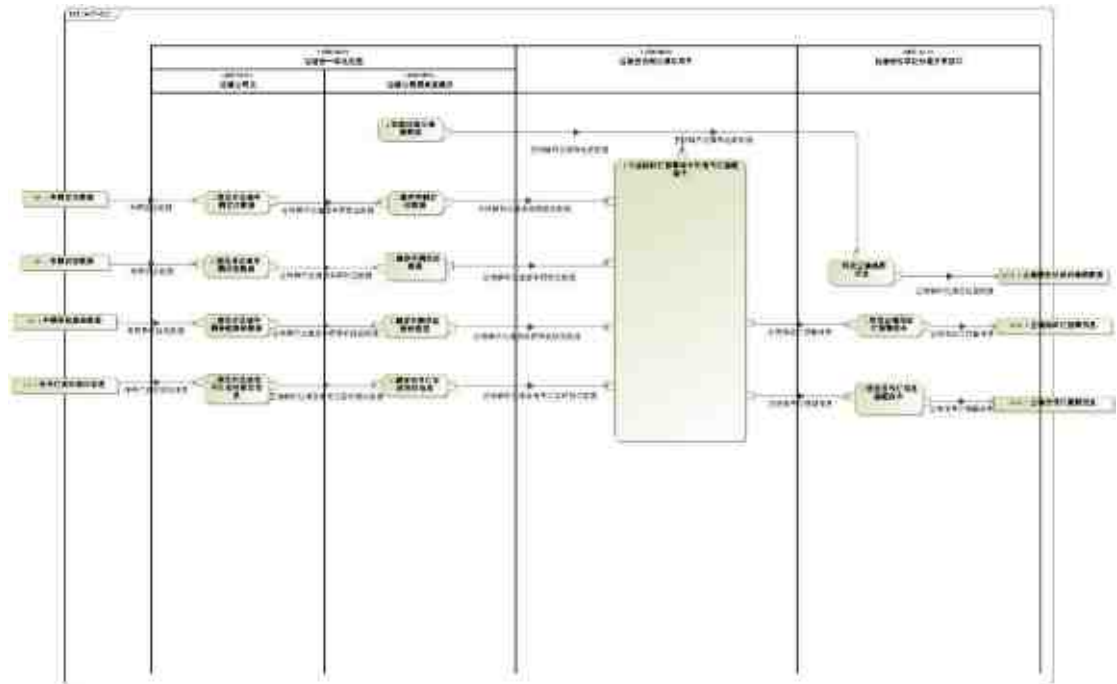
“

”

4-23

“

”



4-23

-

“

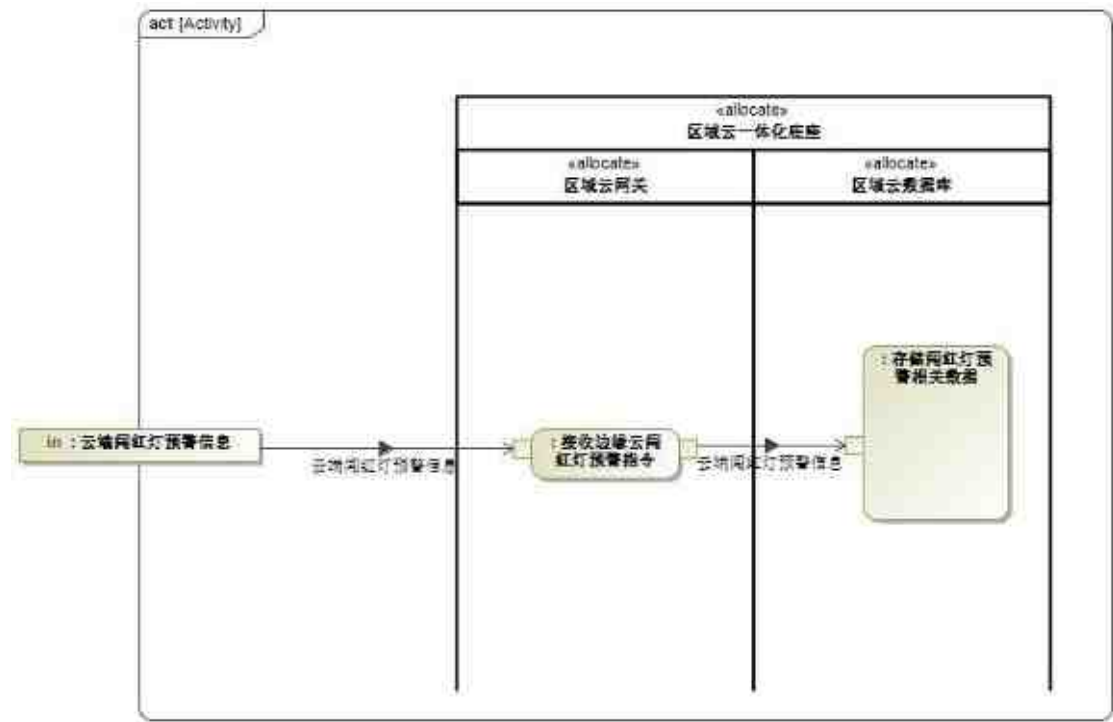
”

1.

2.

3.

4 “ ”  
4-24 “ ”



4-24

“ ”  
1.  
2.

## 4.9

### 4.9.1

### 4.9.2

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### 4.9.3

### 4.9.4

1

2

### 4.9.5

L3

HMI

L4

### 4.9.6

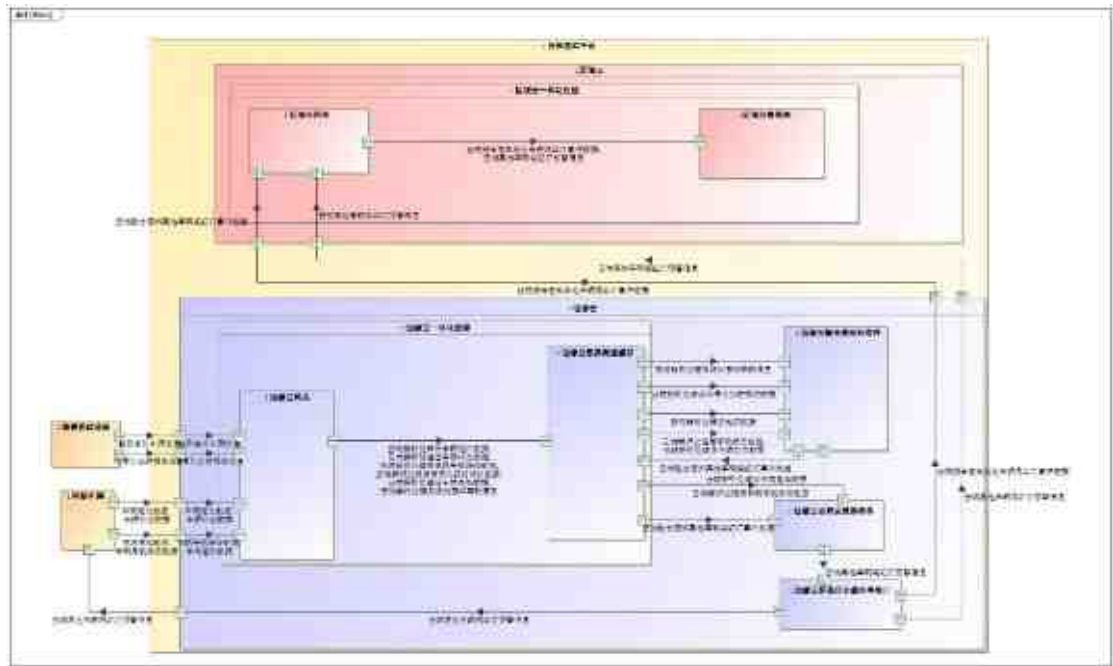
/

### 4.9.7

1

4-25





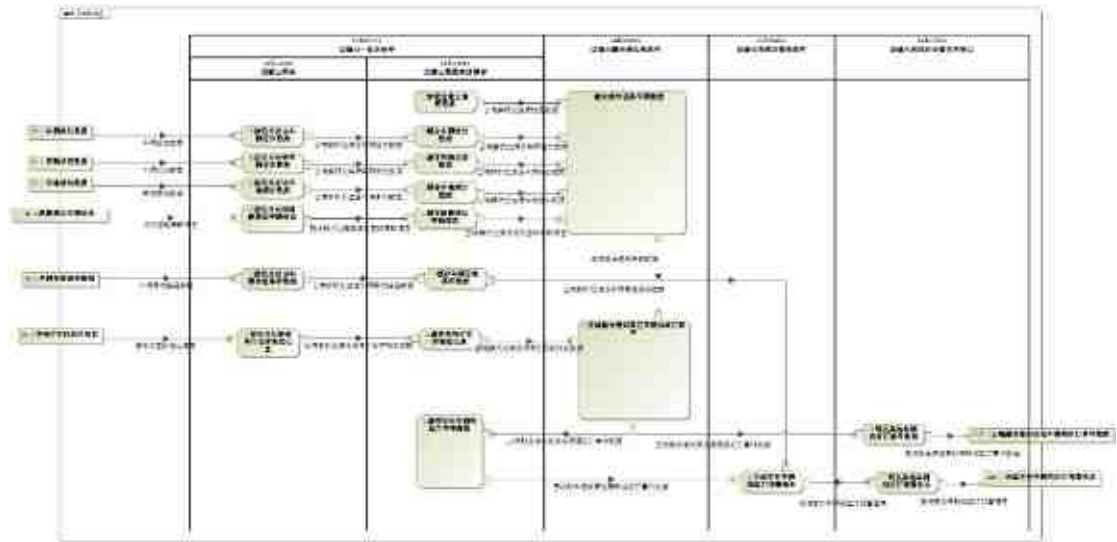
4-25

4-25

2

4-26





4-27

“ ”

1.

2.

3.

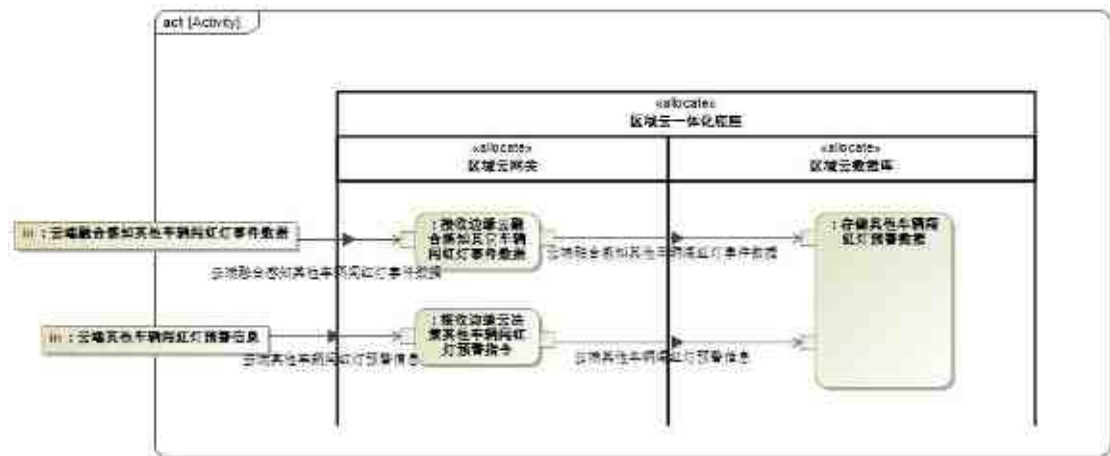
4.

4 “ ”

4-28

”

“



4-28

“ ”

1.

2.

#### 4.10

##### 4.10.1

##### 4.10.2

##### 4.10.3

##### 4.10.4

1

2

#### 4.10.5

L3

HMI

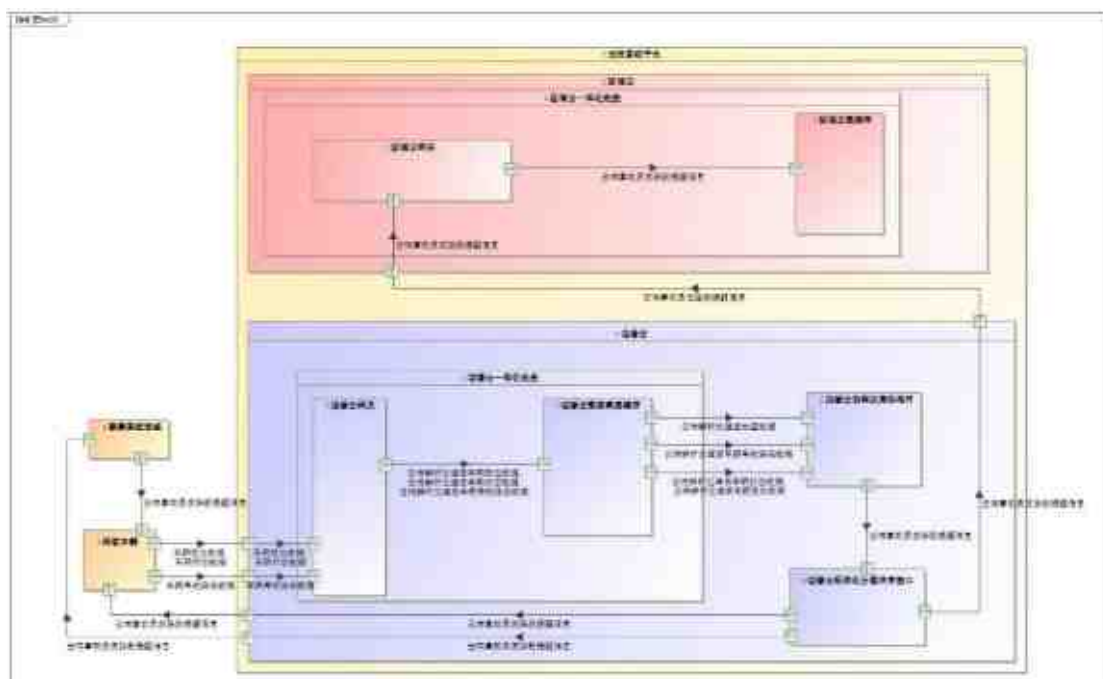
L4

#### 4.10.6 /

#### 4.10.7

1

4-29

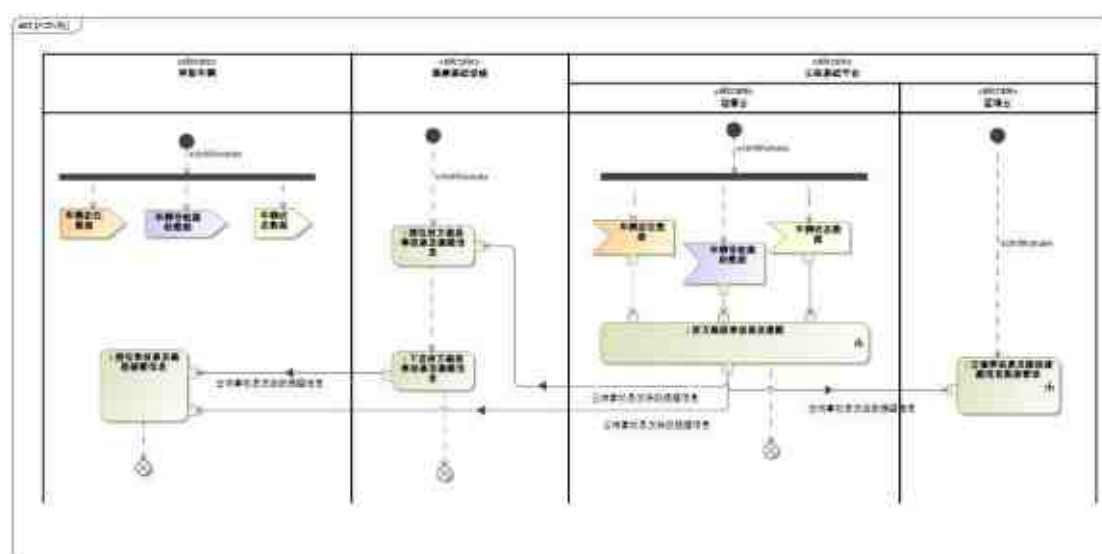


4-29

4-29

2

4-30



4-30

1.

2.

3.

3

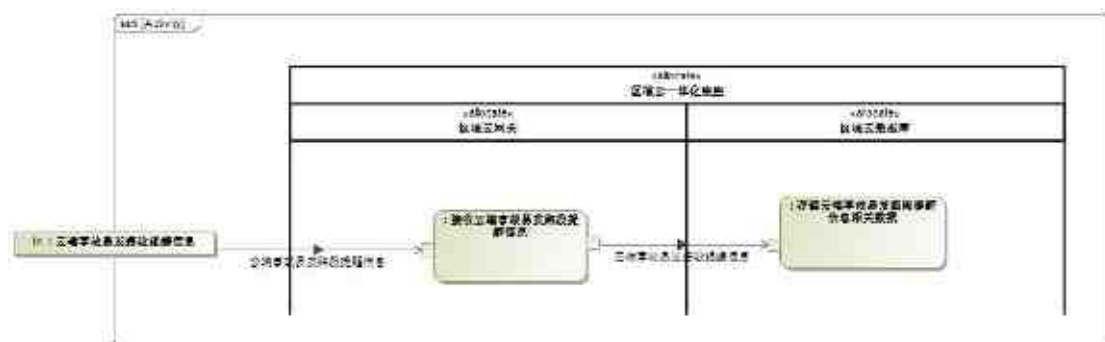
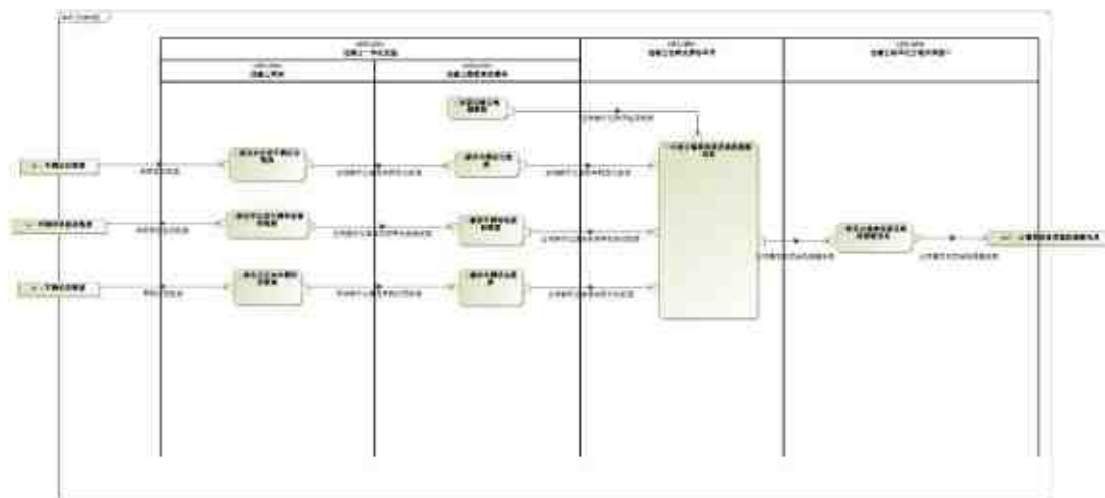
“

”

4-31

“

”



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4.11

4.11.1

4.11.2

4.11.3

4.11.4

1

2

4.11.5

L3

HMI

L4

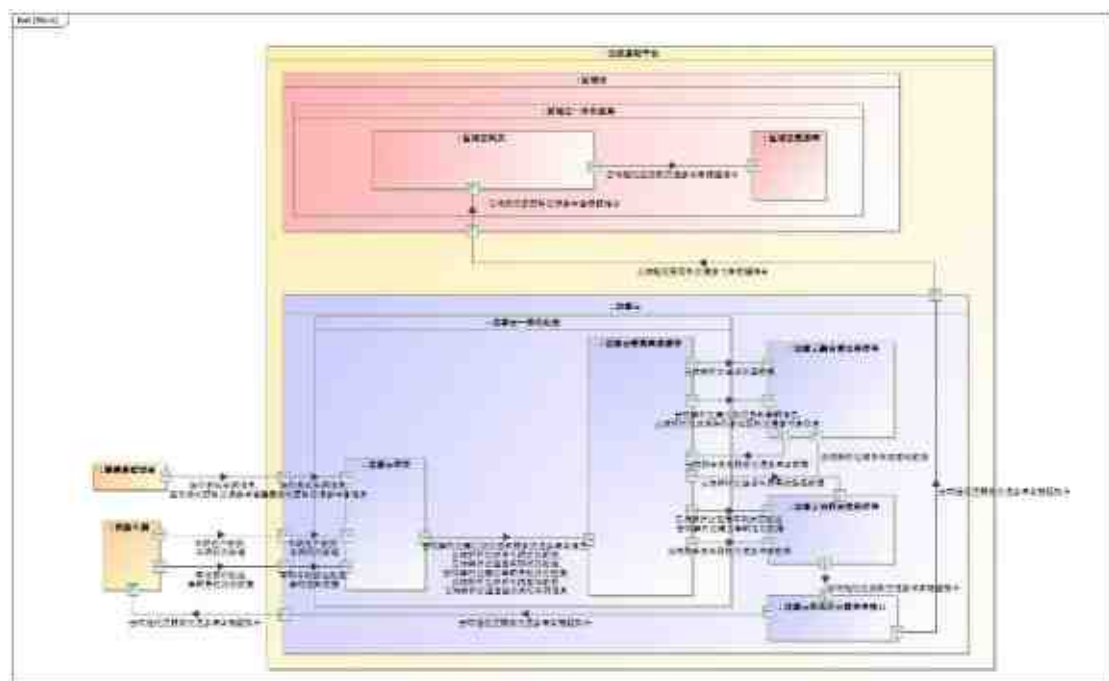
4.11.6            /



#### 4.11.7

1

4-33

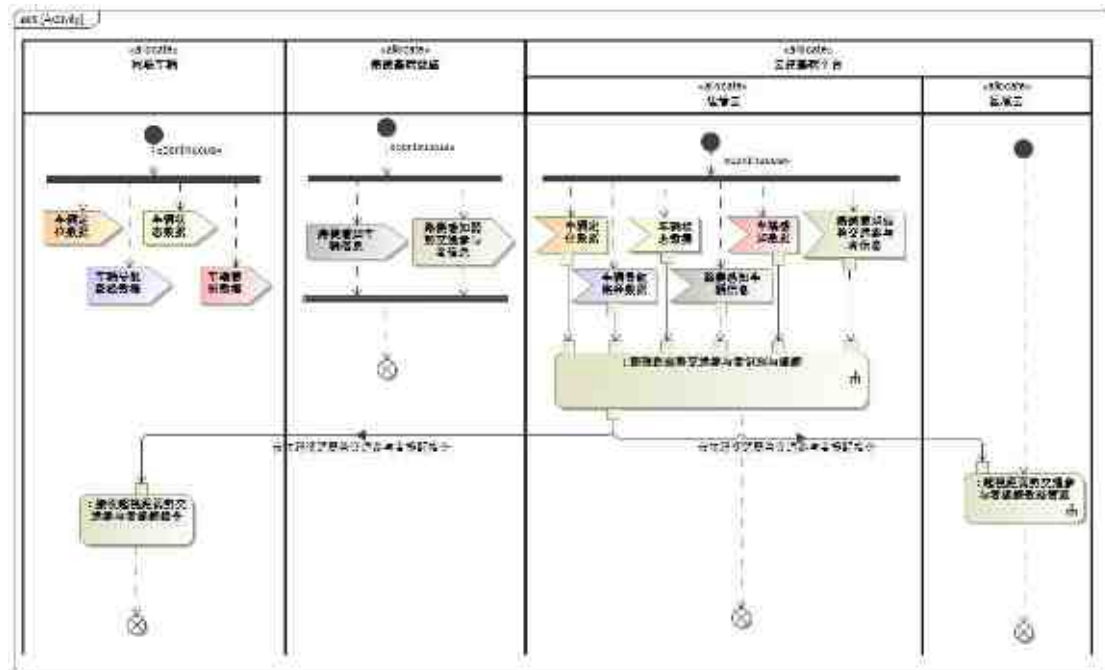


4-33

4-33

2

4-34



4-34

1.

2.

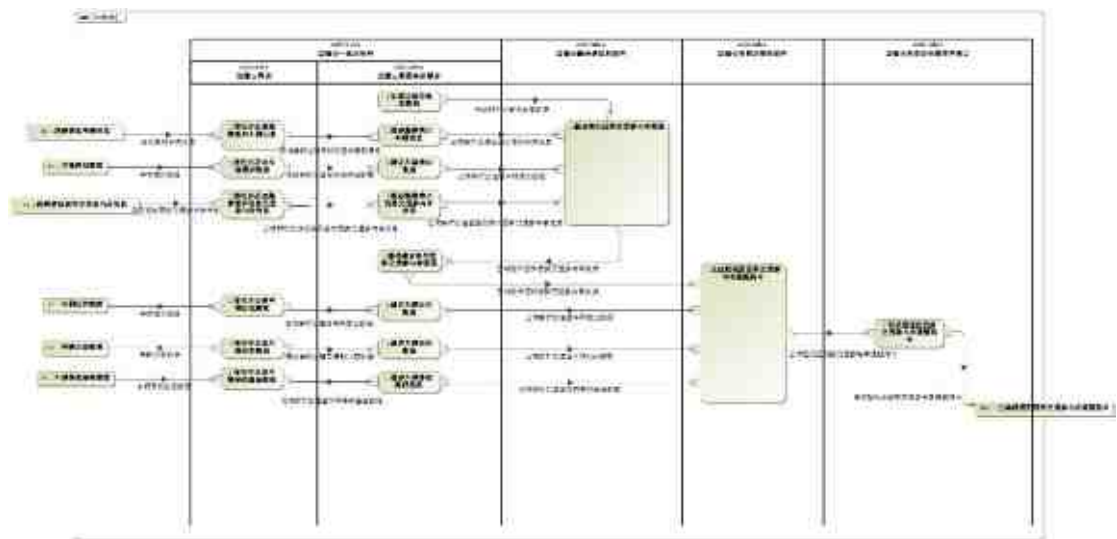
3.

3 “ ”

4-35

“

”



4-35

“ ”

1.

2.

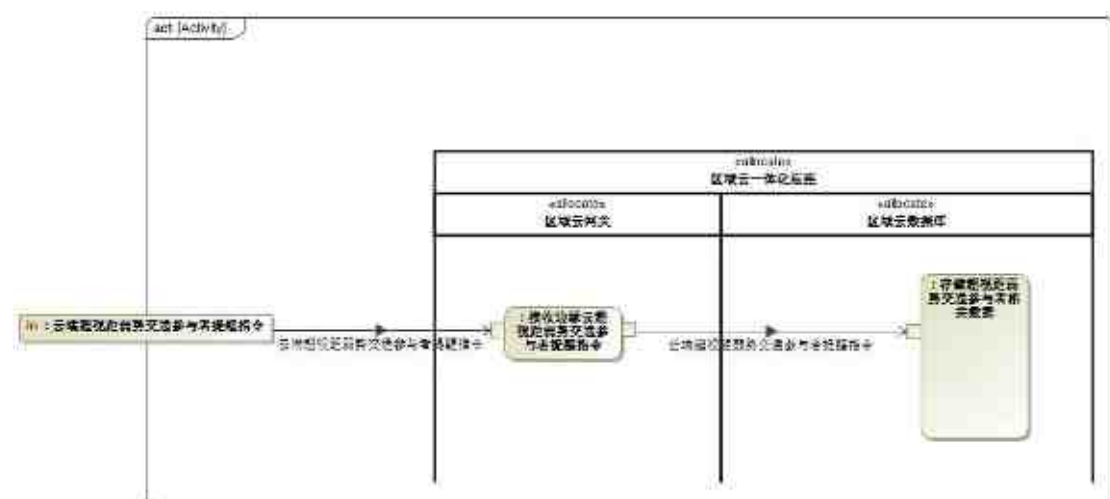
3.

4.

4 “ ”

4-36

“ ”



4-36

“ ”

1.

2.

## 4.12

### 4.12.1

### 4.12.2

### 4.12.3

### 4.12.4

1

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2

#### 4.12.5

L3

HMI

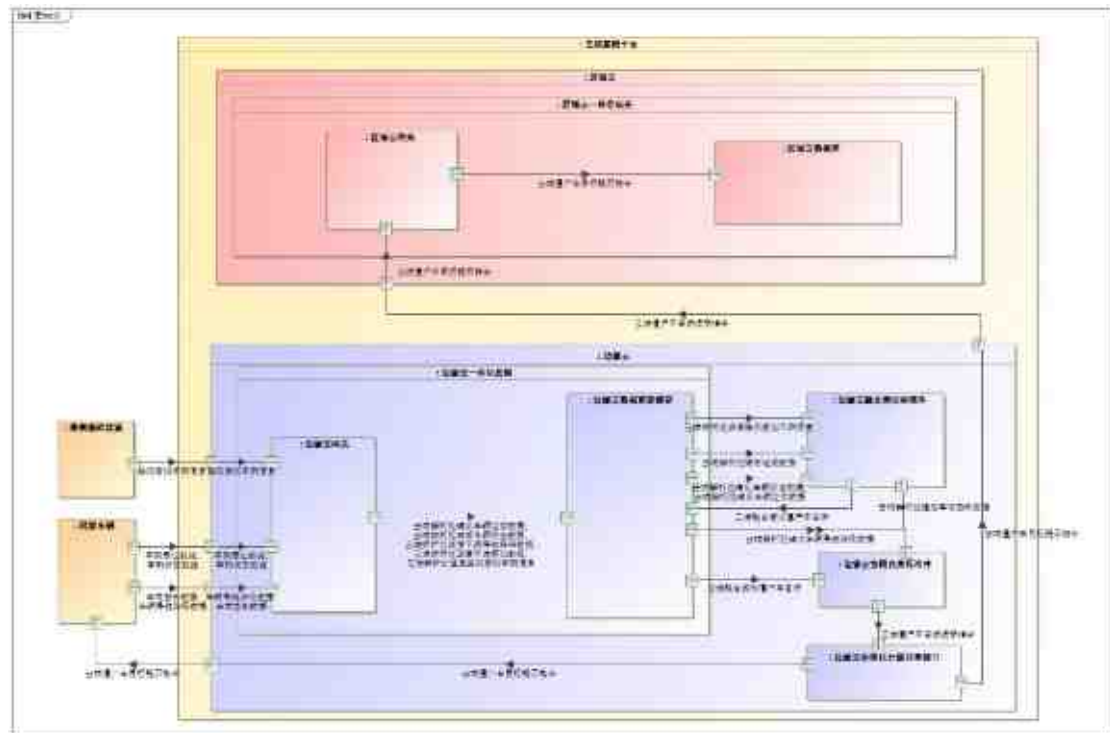
L4

#### 4.12.6 /

#### 4.12.7

1

4-37

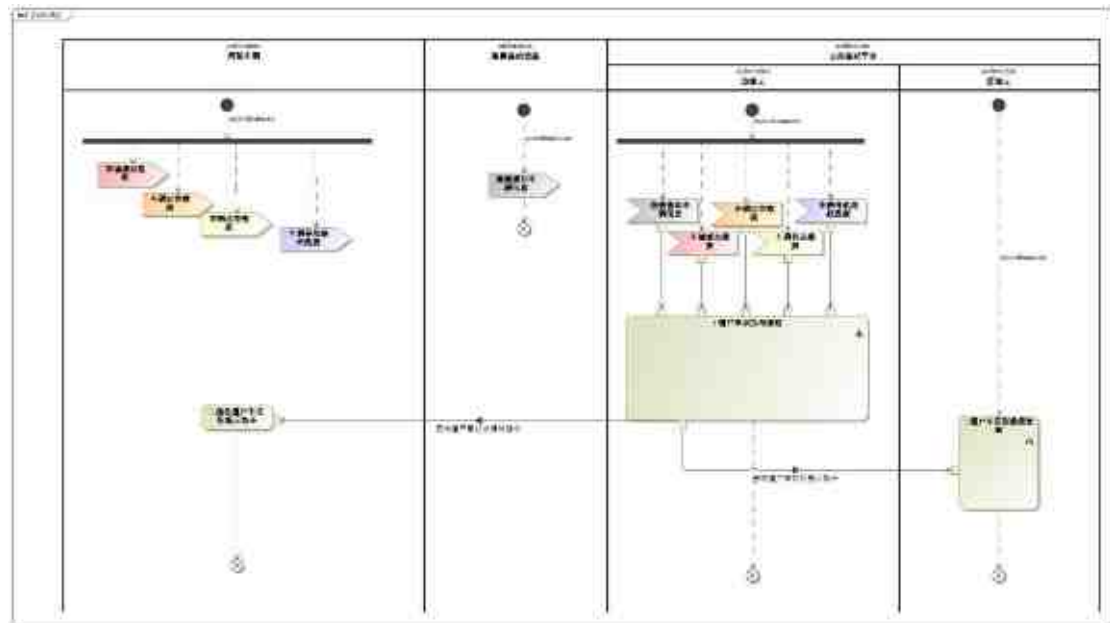


4-37

4-37

2

4-38



4-38

1.

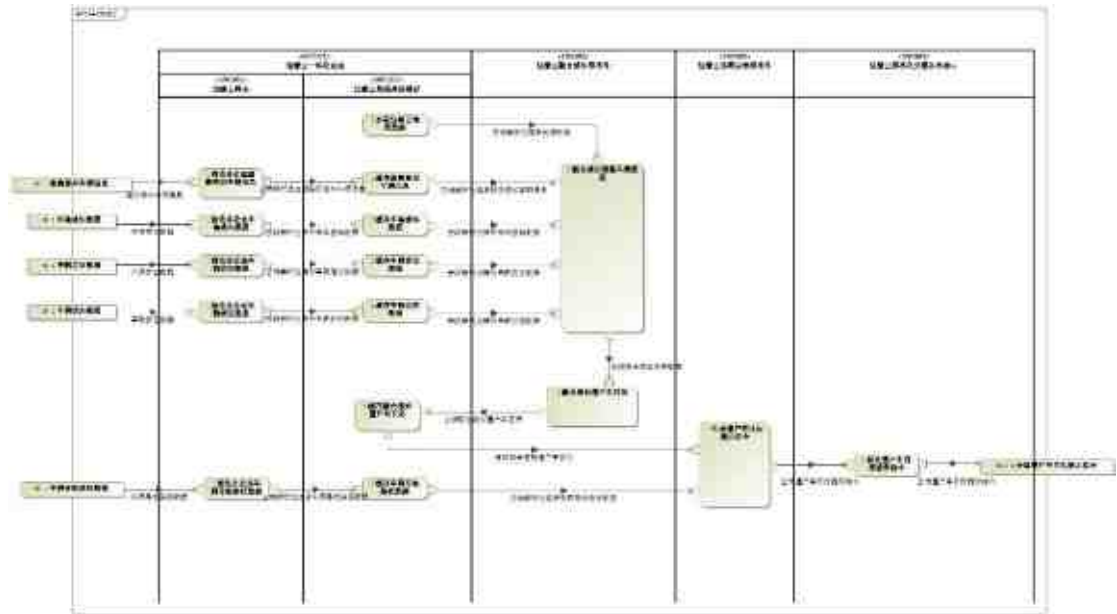
2.

3.

3 “ ”

4-39

“ ”



4-39

“ ”

1.

2.

3.

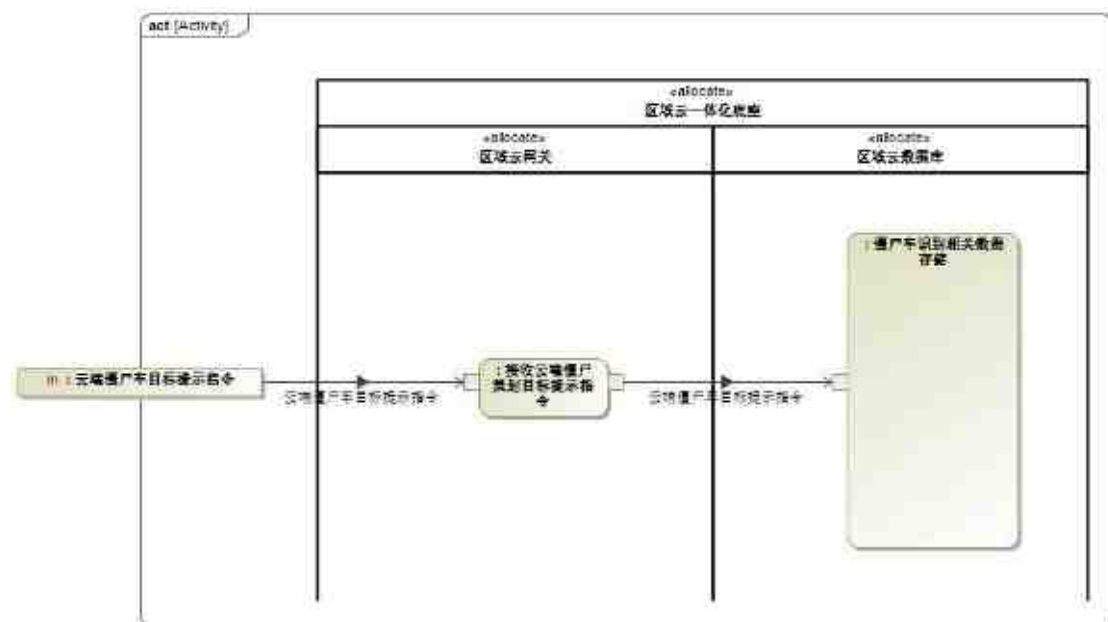
4.

4 “ ”

4-40

“ ”





4-40

-

“ ”

- 1.
- 2.

## 4.13

### 4.13.1

### 4.13.2

### 4.13.3

### 4.13.4

1

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2

**4.13.5**

L3

HMI

L4

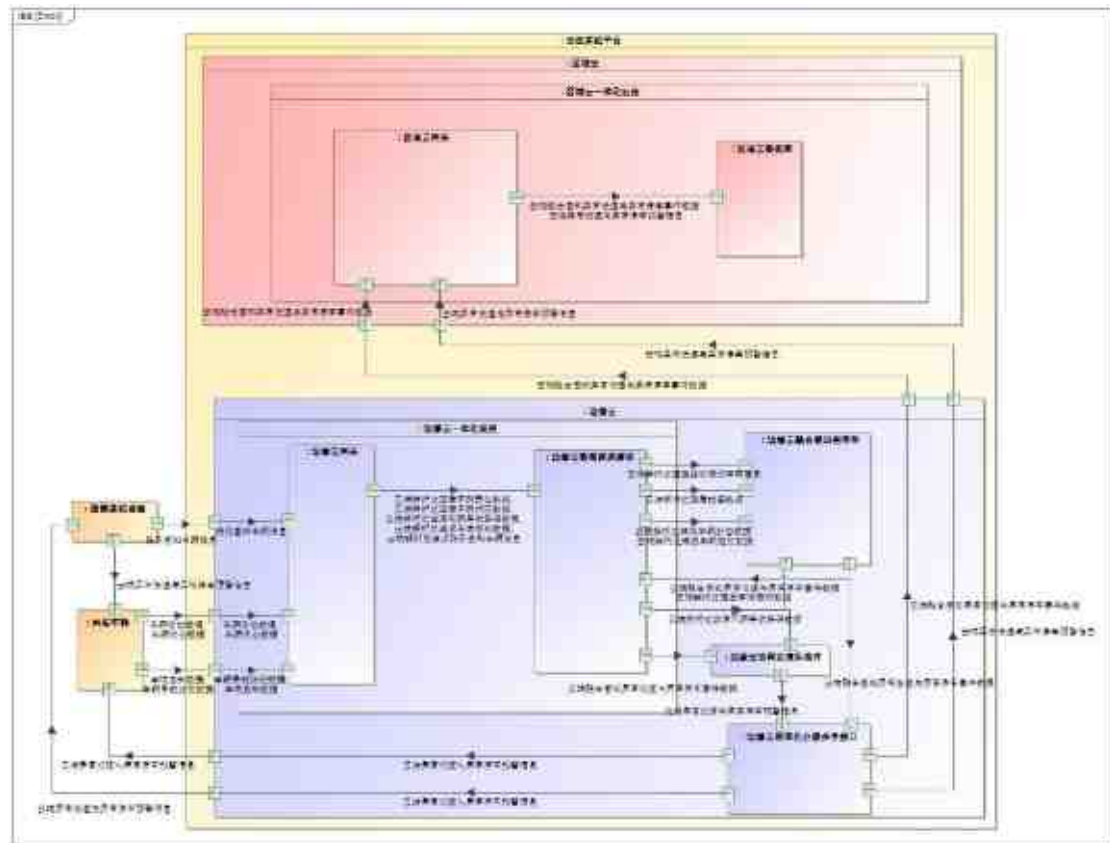
**4.13.6**

/

**4.13.7**

1

4-41

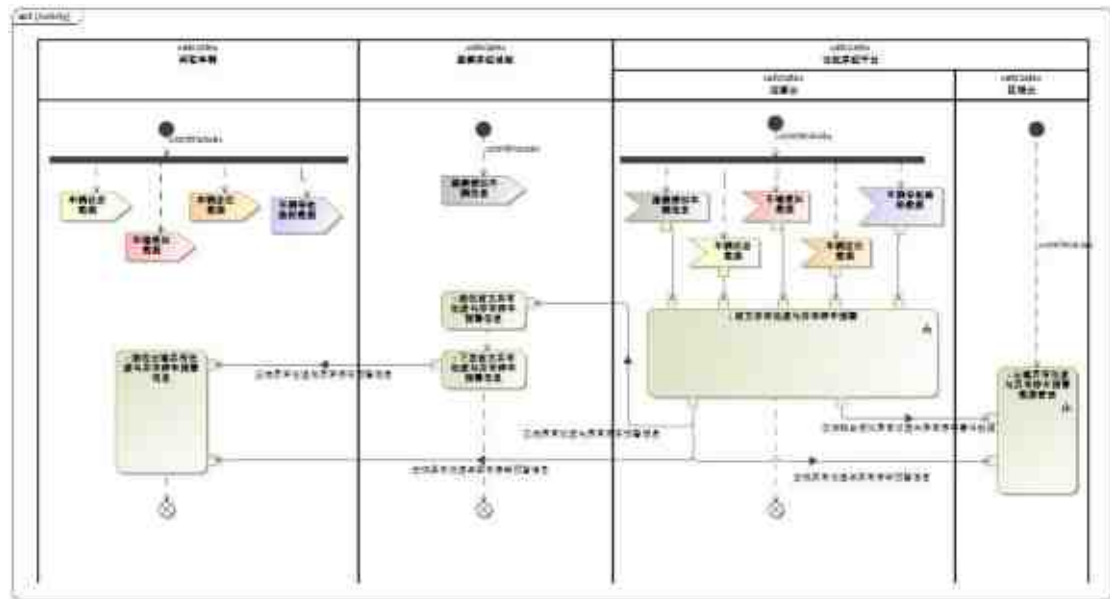


4-41

4-41

2

4-42



4-42

1.

2.

3.

4.

3 “

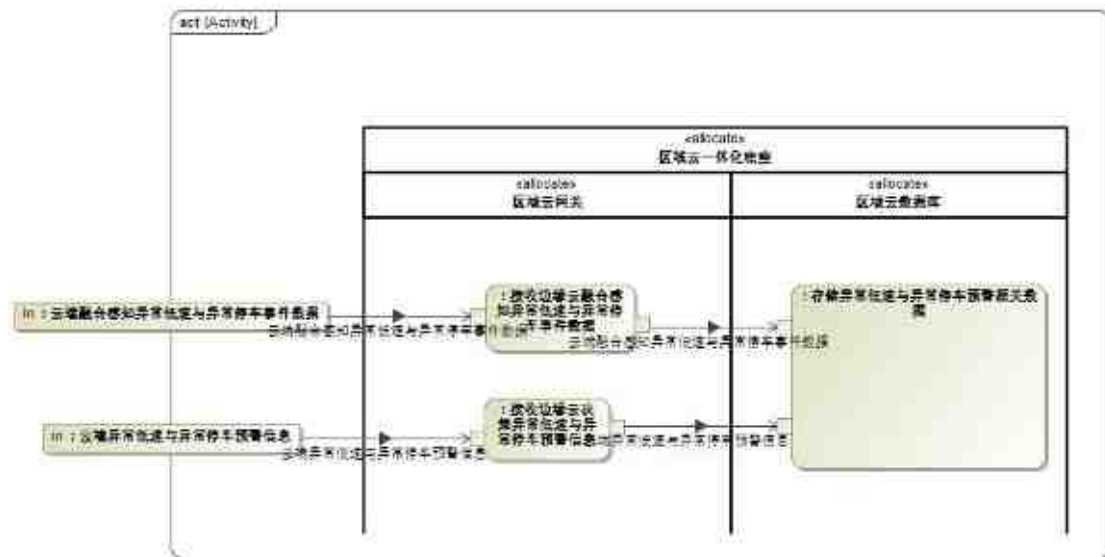
”

4-43

“

”





4-44

-

“ ”

1.

2.

4.14

4.14.1

4.14.2

4.14.3

4.14.4

1

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2

#### 4.14.5

L3

HMI

L4

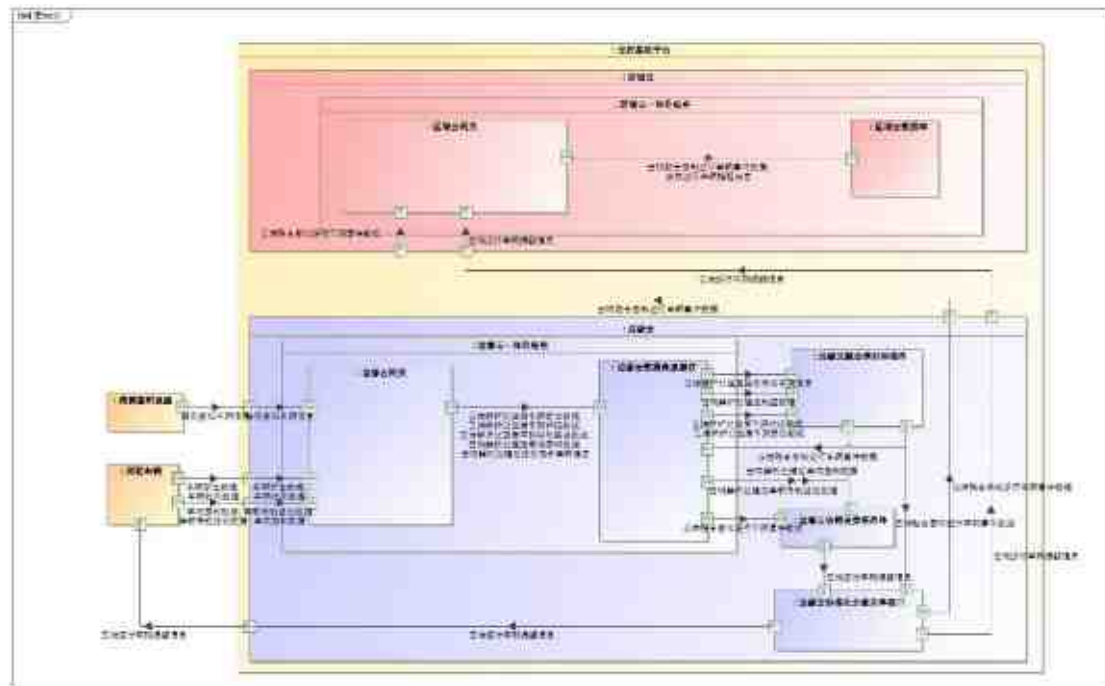
#### 4.14.6

/

#### 4.14.7

1

4-45

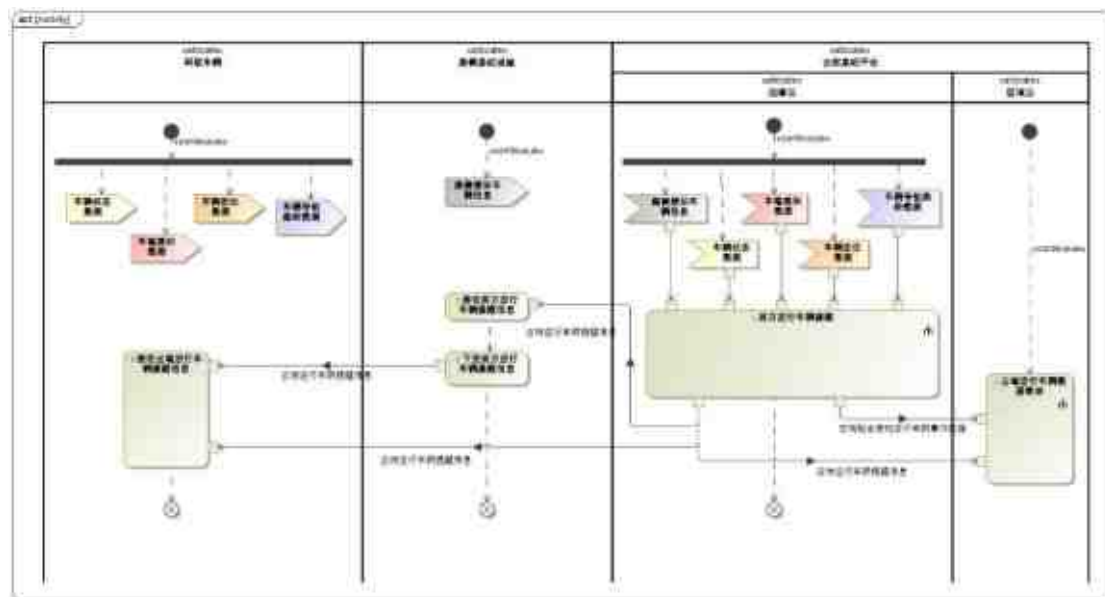


4-45

2

4-46





1.

2.

3.

4.

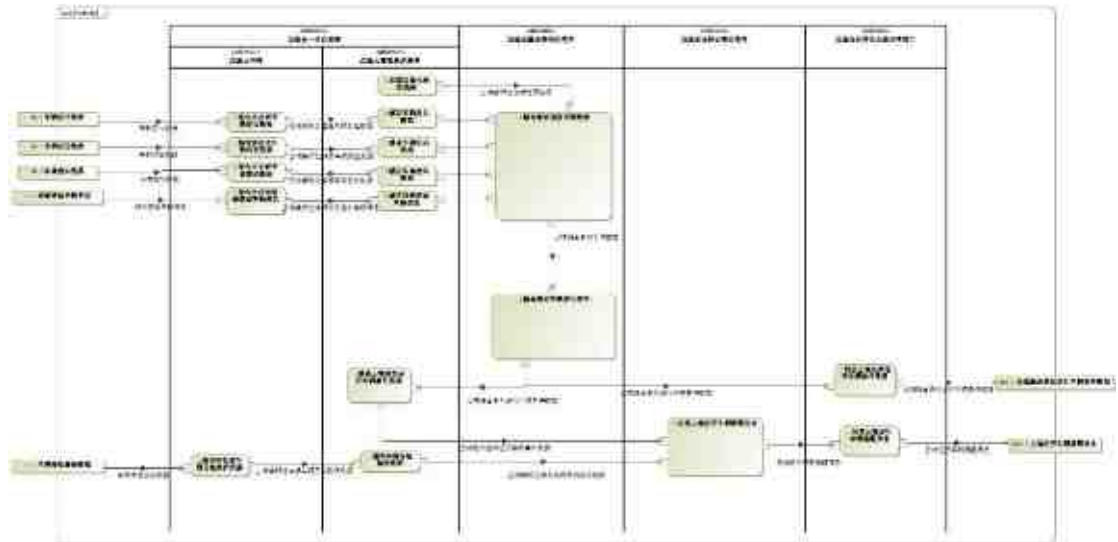
3 “

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4-47

“

"



4-47

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“ ”

1.

2.

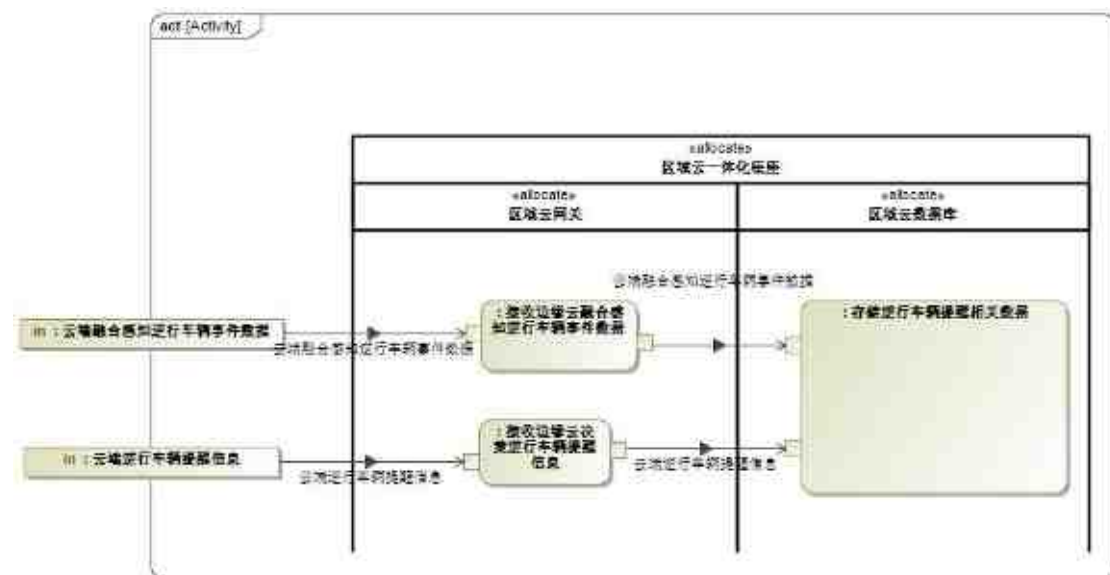
3.

4.

4 “ ”

4-48

“ ”



4-48

“ ”

1.

2.

4.15

4.15.1

4.15.2

4.15.3

4.15.4

1

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2

#### 4.15.5

L3

HMI

L4

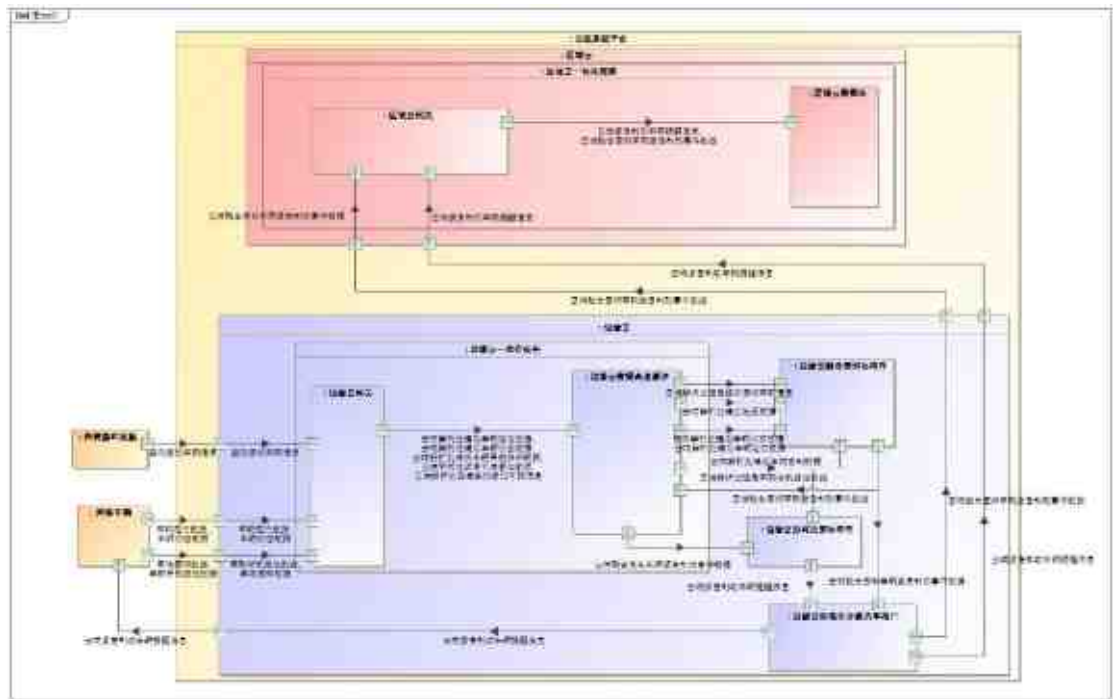
#### 4.15.6

/

#### 4.15.7

1

4-49

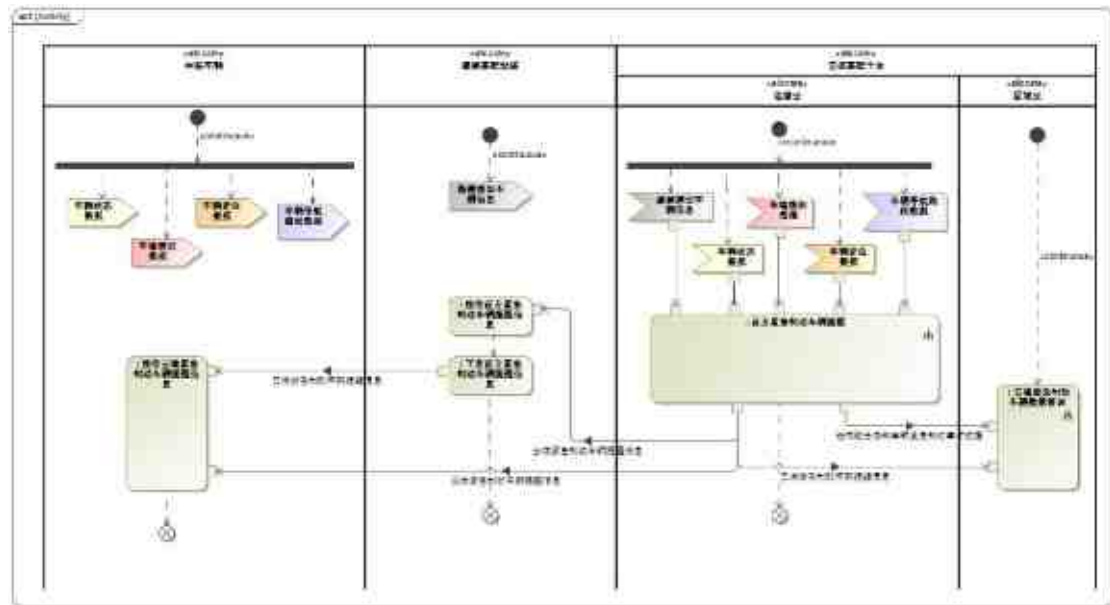


4-49

4-49

2

4-50



4-50

1.

2.

3.

4.

3 “

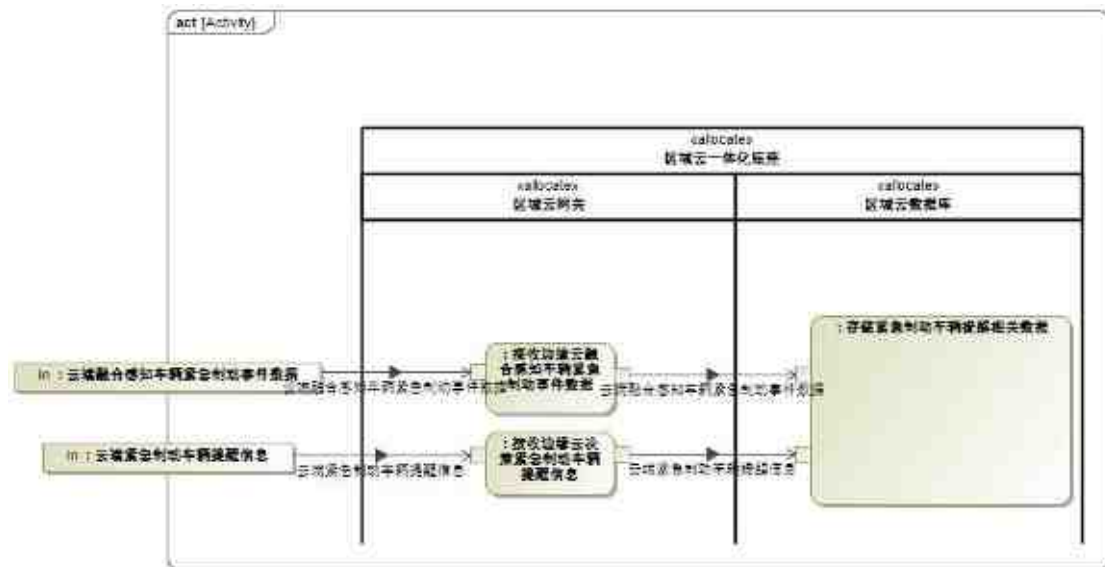
”

4-51

“

”





4-52

“ ”

1.

2.

4.16

4.16.1

4.16.2

4.16.3

4.16.4

1



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2

#### 4.16.5

L3

HMI

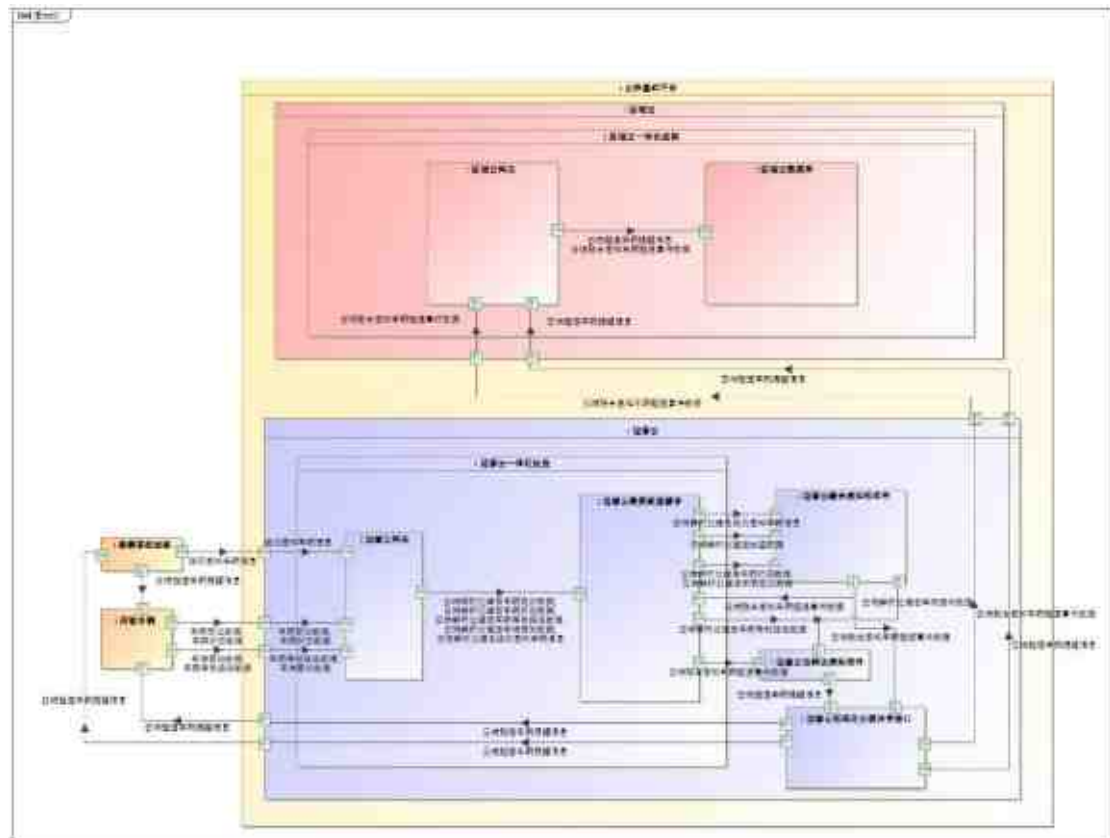
L4

#### 4.16.6 /

#### 4.16.7

1

4-53

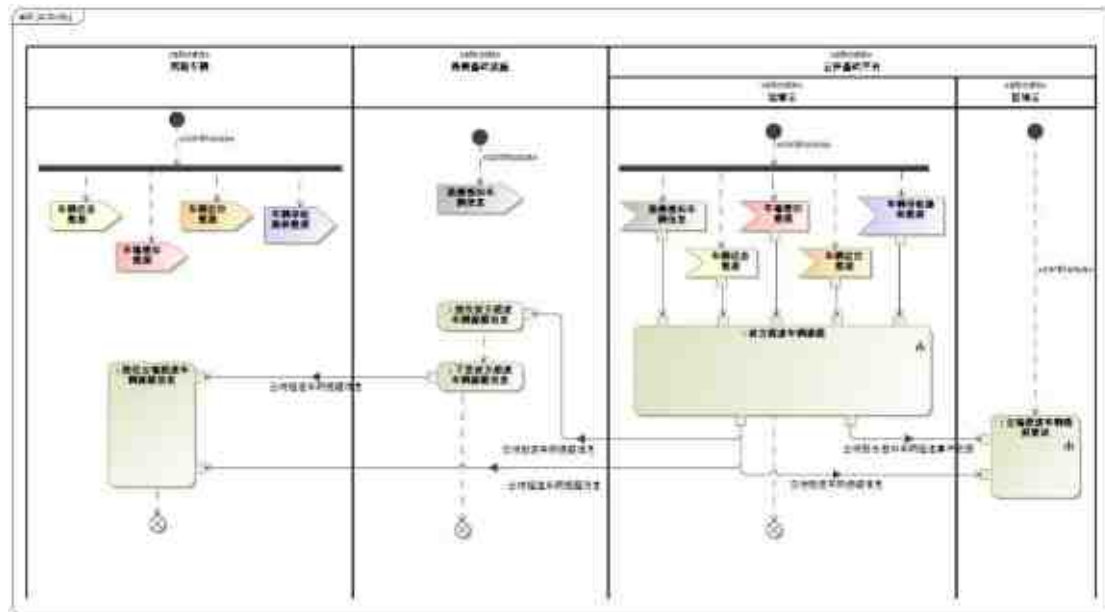


4-53

4-53

2

4-54



1.

2.

3.

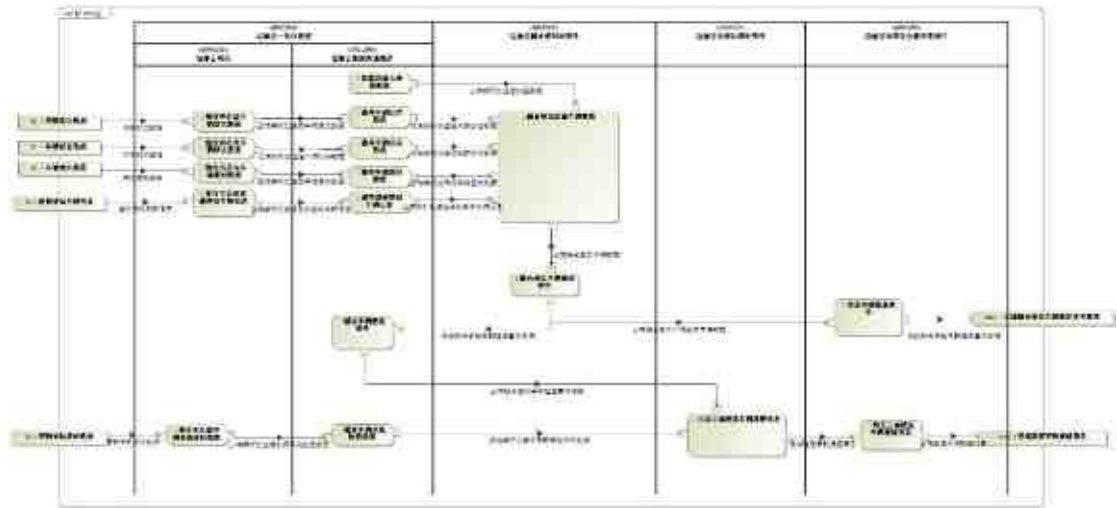
4.

3 “

4-55

“

"



4-55

“ ”

1.

2.

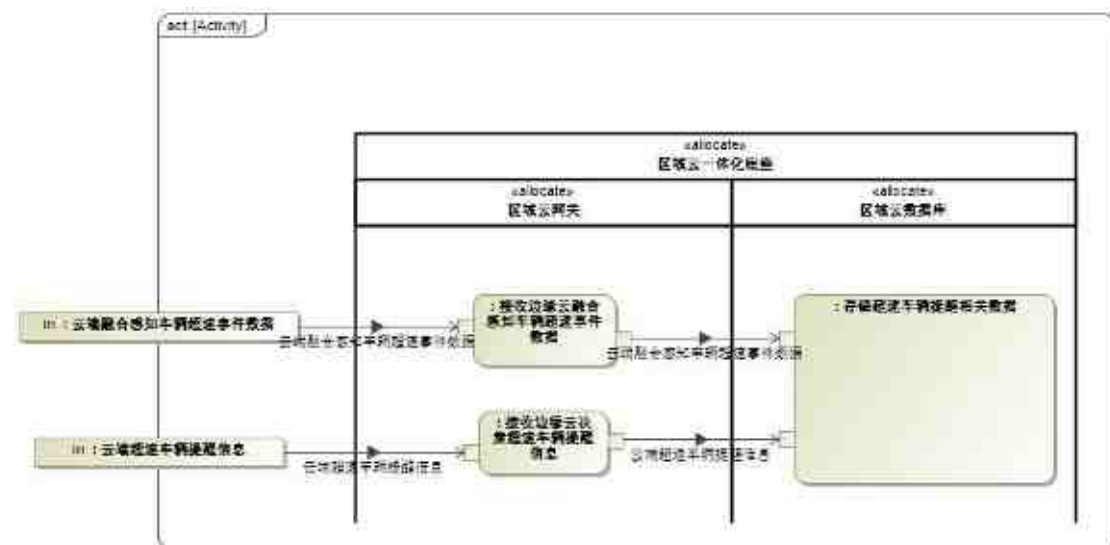
3.

4.

4 “ ”

4-56

“ ”



4-56

“ ”

1.

2.

4.17

4.17.1

4.17.2

4.17.3

4.17.4

1

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2

3

4

#### 4.17.5

L3

HMI

L4

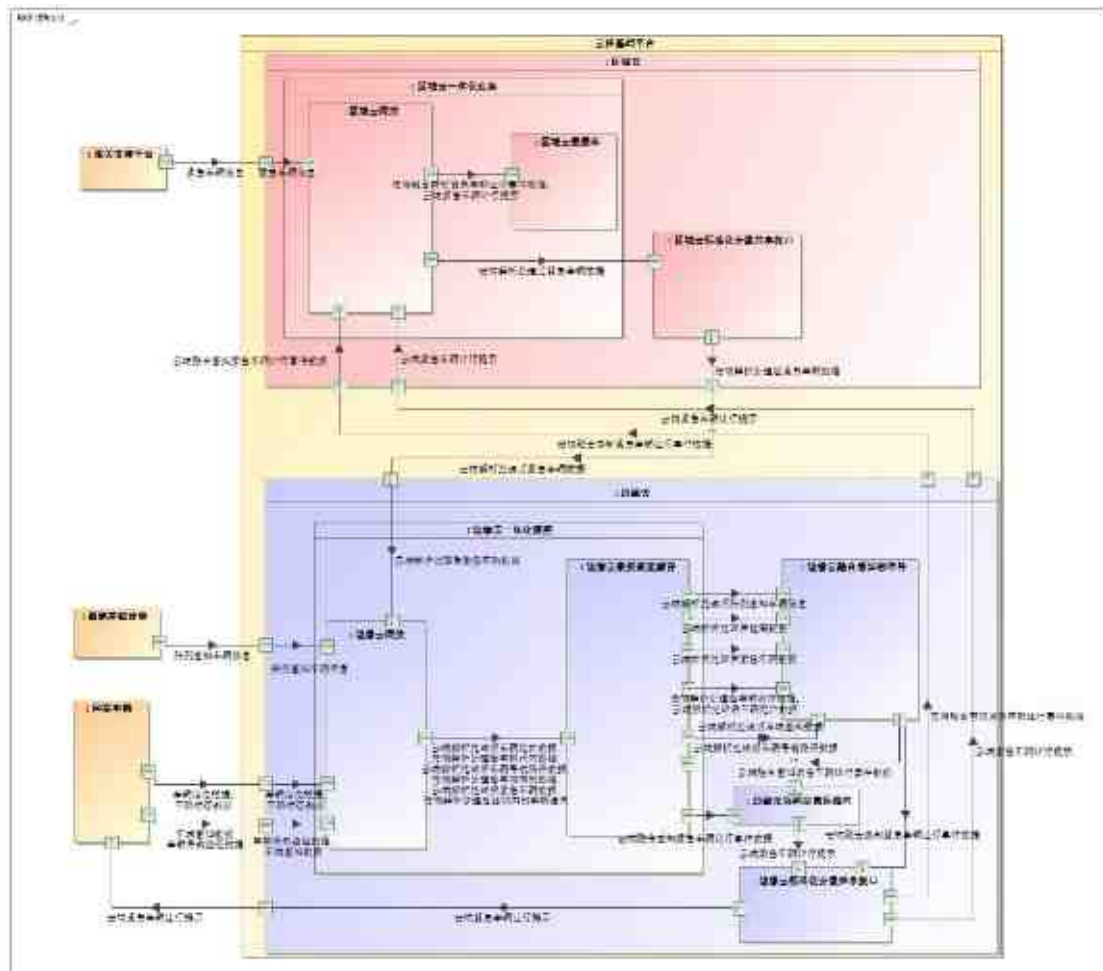
#### 4.17.6

/

#### 4.17.7

1

4-57

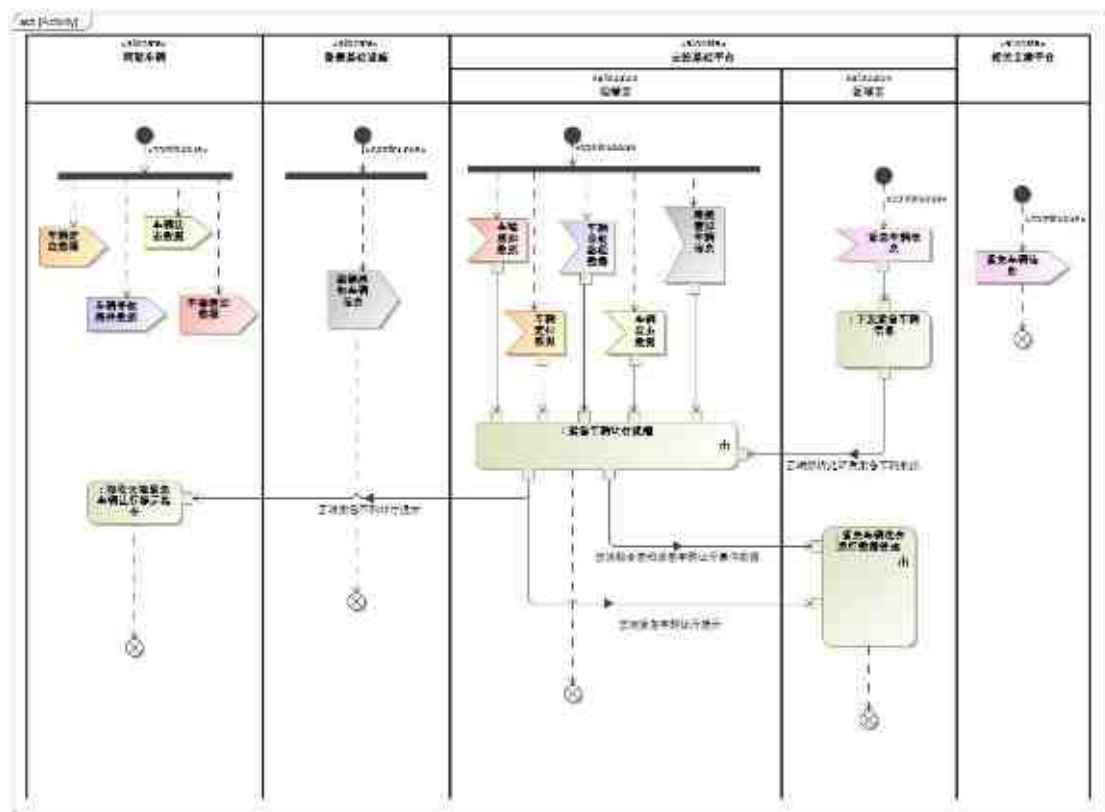


4-57

4-57

2

4-58



4-58

1.

2.

3.

4.

4 “

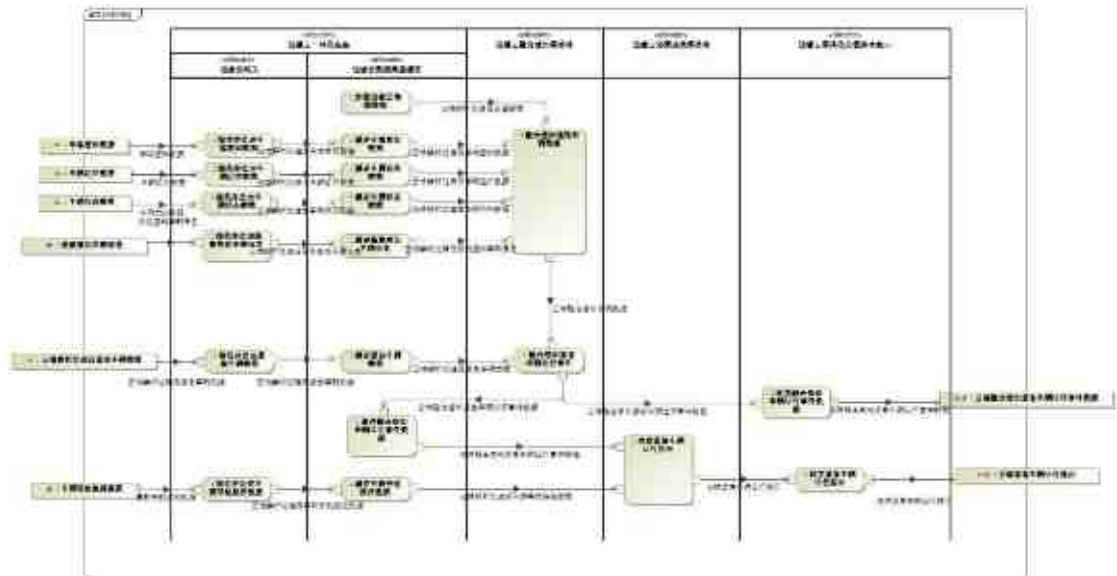
”

4-59

“

”





4-59

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“ ”

1.

2.

3.

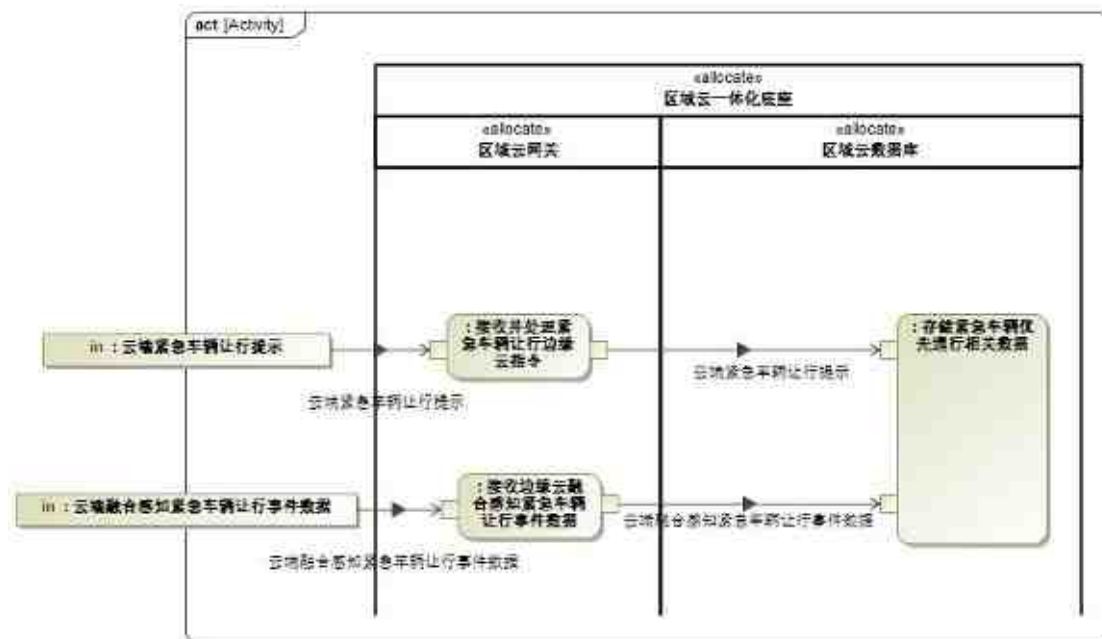
4.

5 “ ”

4-60

“

”



4-60

“ ”

1.

2.

4.18

4.18.1

4.18.2

4.18.3

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#### 4.18.4

1

2

#### 4.18.5

L3

HMI

L4

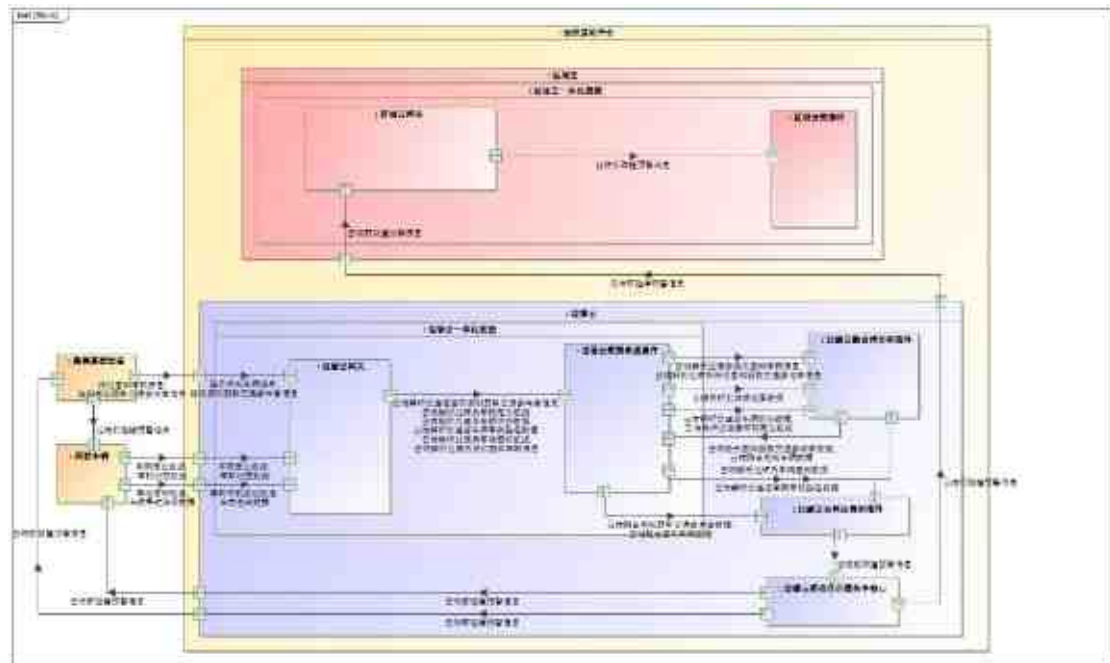
#### 4.18.6

/

#### 4.18.7

1

4-61

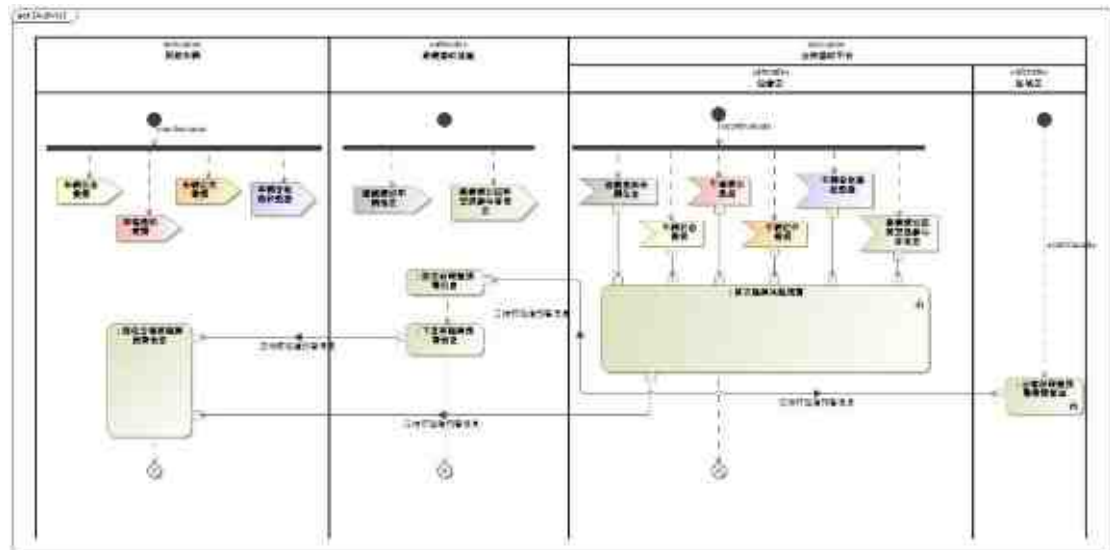


4-61

4-61

2

4-62



4-62

1.

2.

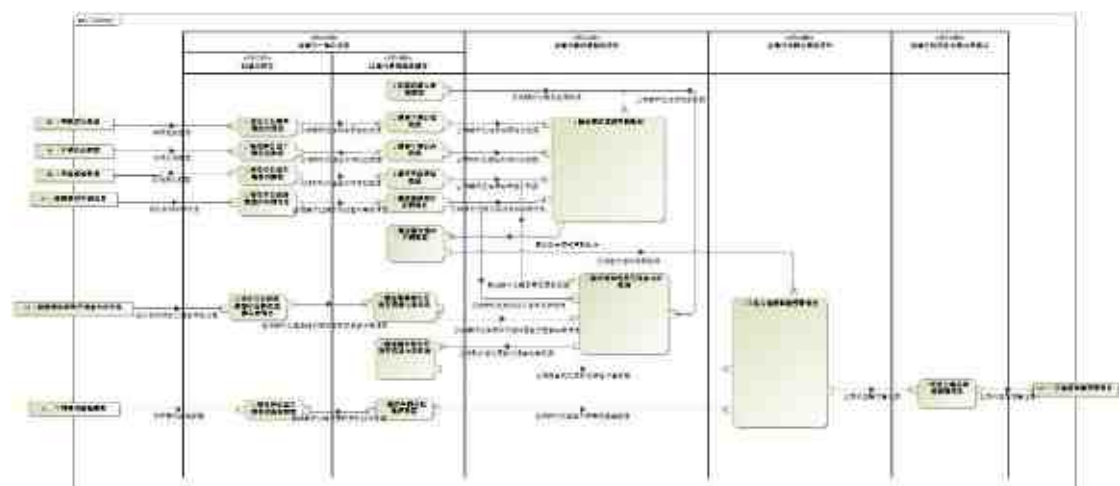
3.

3 “ ”

4-63

“

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4-63

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“ ”

1.

2.

3.

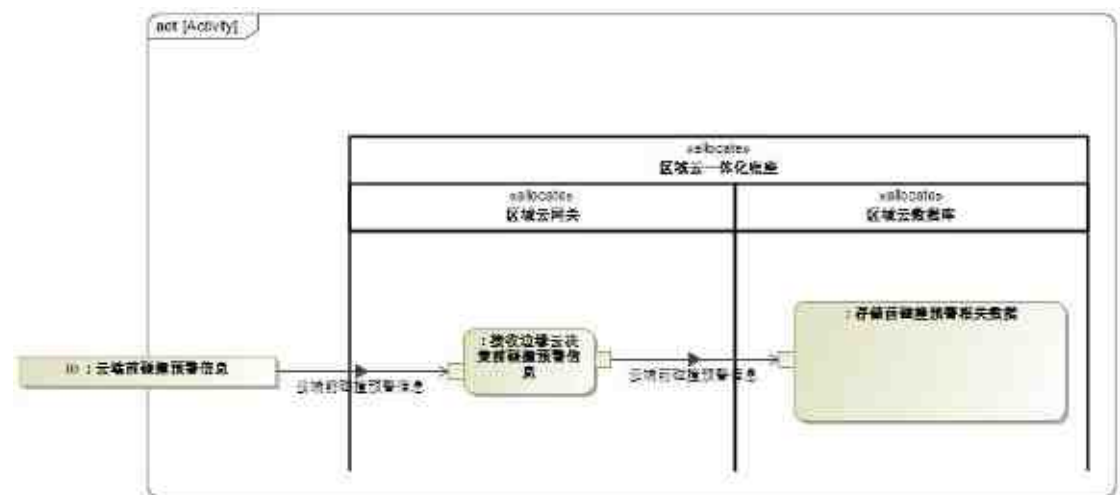
4.

4 “ ”

4-64

“

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4-64

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- “ ”
- 1.
  - 2.

## 4.19

### 4.19.1

### 4.19.2

1-4

### 4.19.3

### 4.19.4

1

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2

#### 4.19.5

L3

HMI

L4

#### 4.19.6

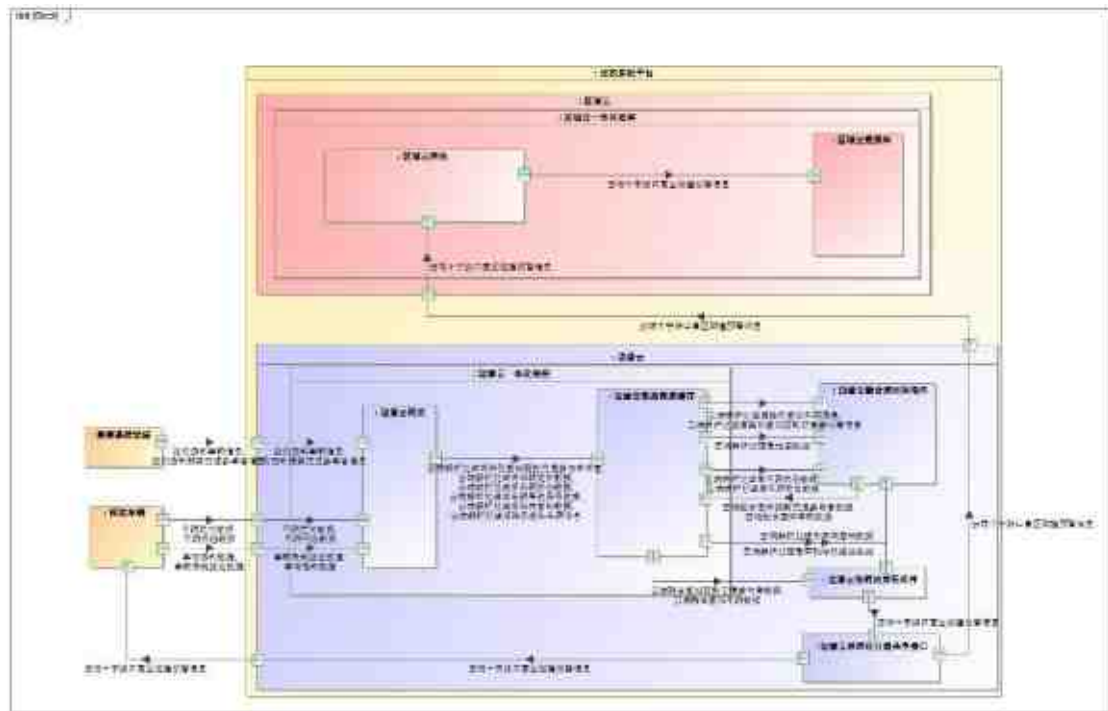
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#### 4.19.7

1

4-65



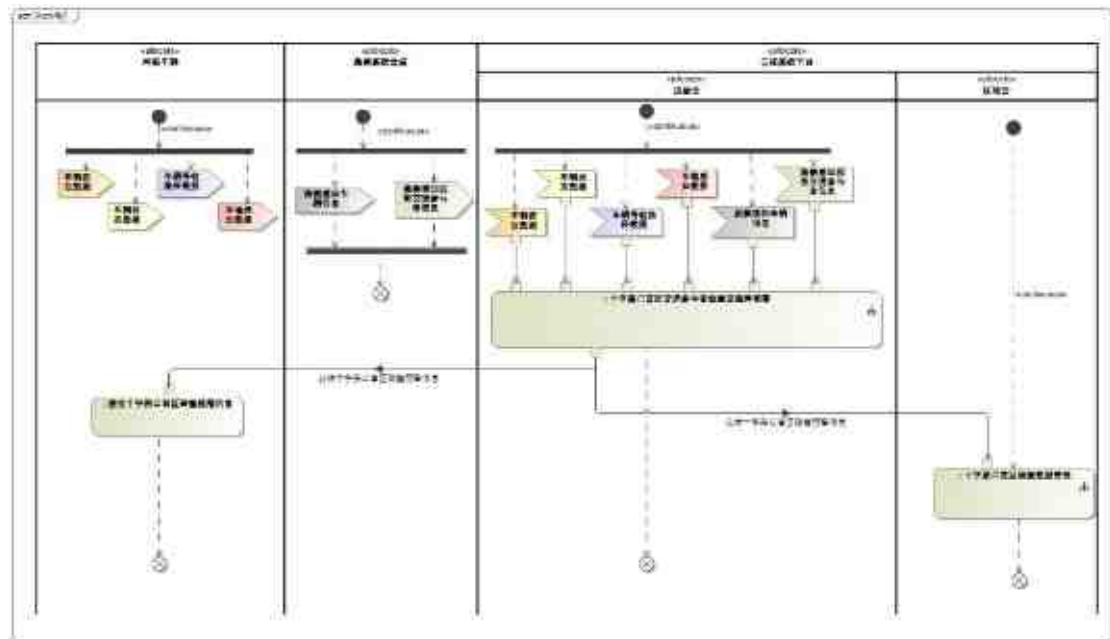


4-65

4-65

2

4-66



4-66

1.

2.

3.

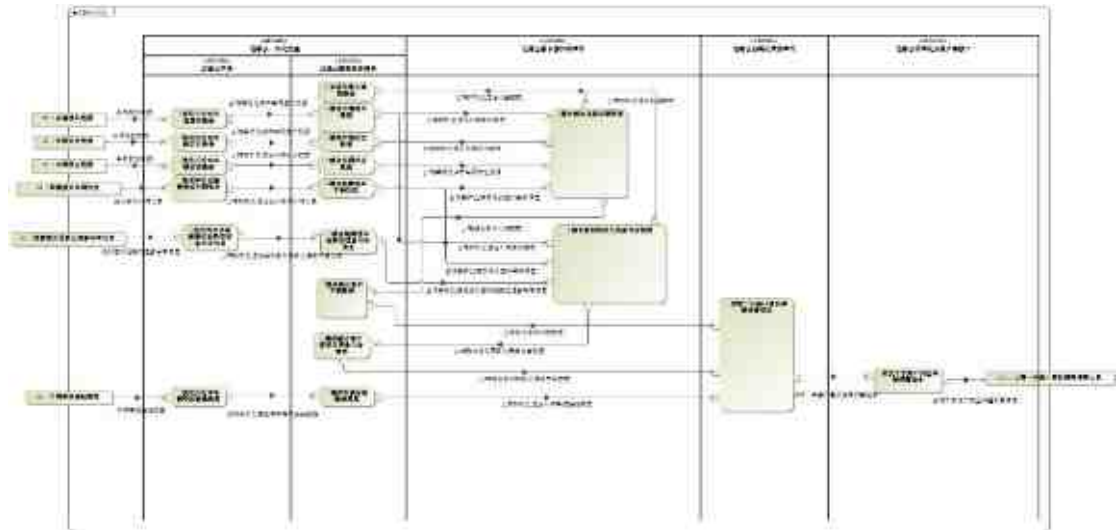
3 “

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4-67

“

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4-67

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“ ”

1.

2.

3.

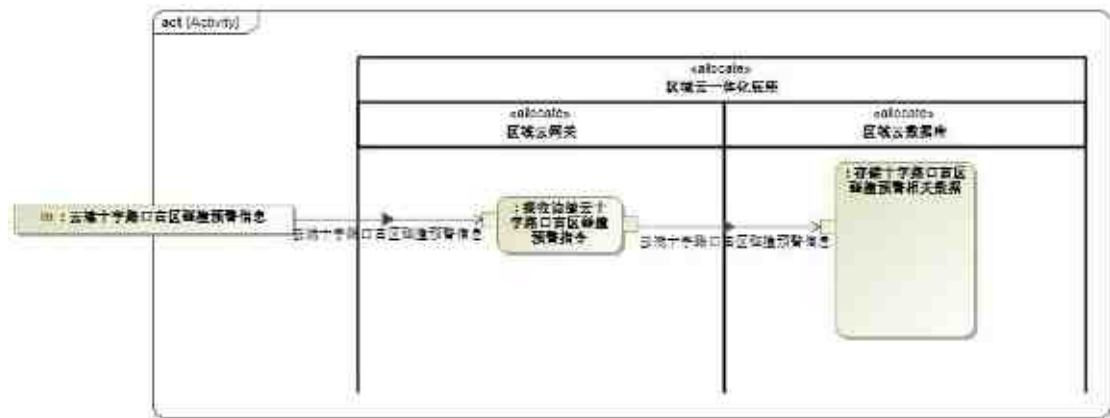
4.

4 “ ”

4-68

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4-68

“ ”

1.

2.

4.20

4.20.1

4.20.2

4.20.3

4.20.4

1

2

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3

4

#### 4.20.5

L3

HMI

L4

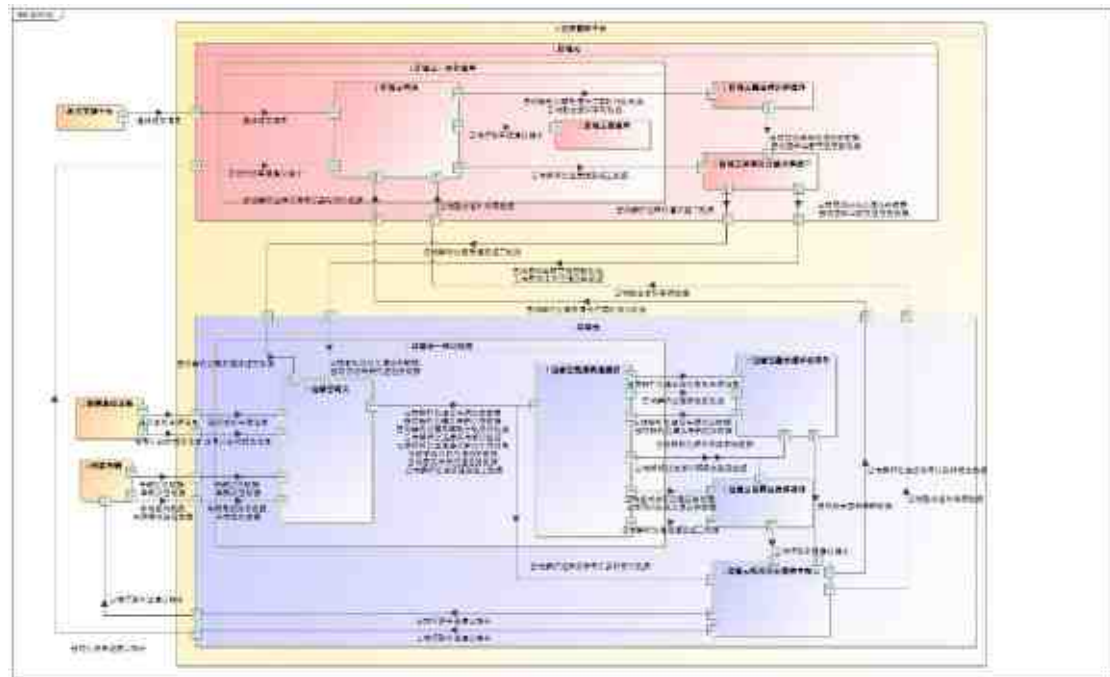
#### 4.20.6

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#### 4.20.7

1

4-69

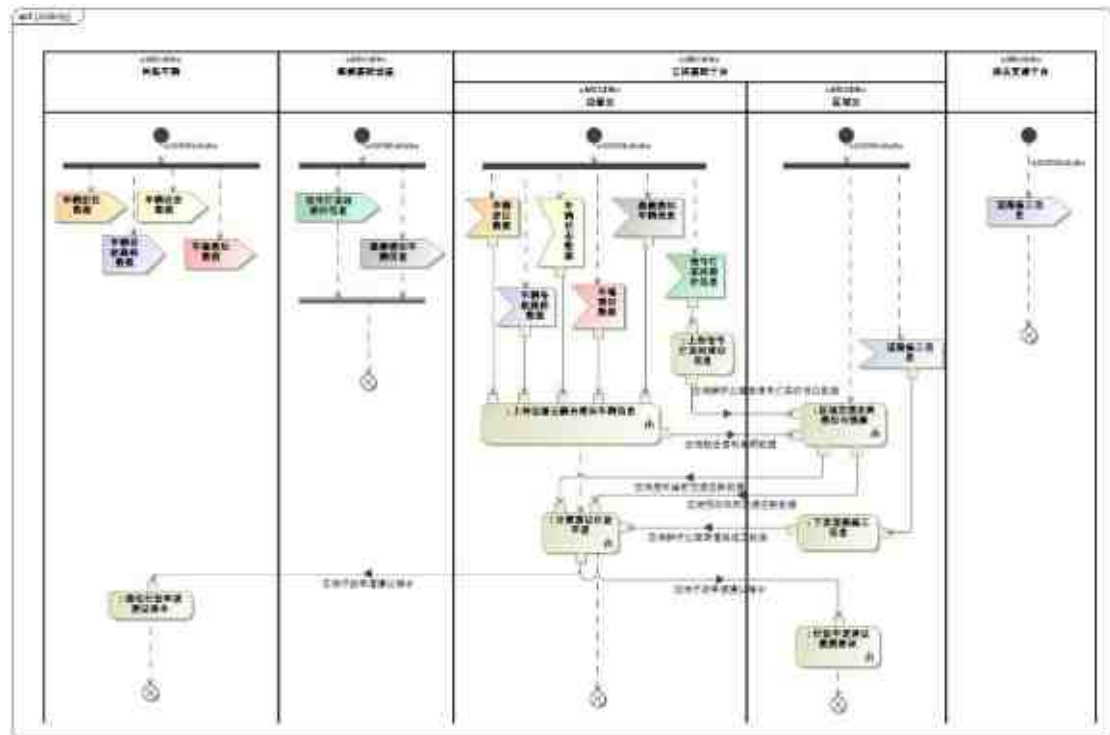


4-69

4-69

2

4-70



4-70

1.

2.

3.

4.

5.

6.

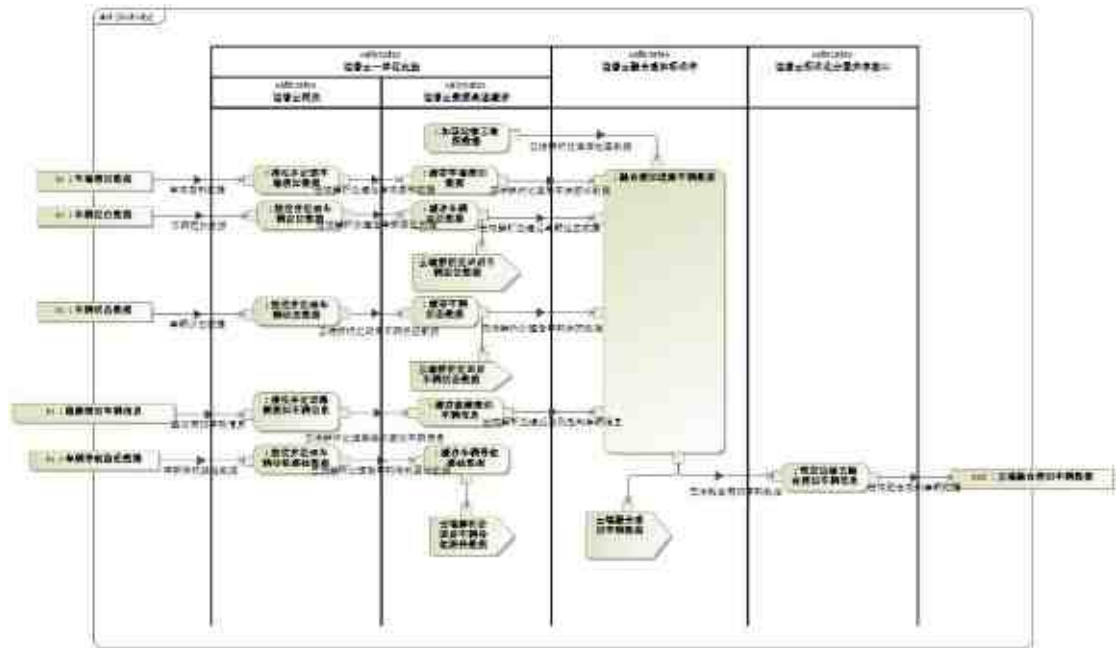
3 “

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4-71

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4-71

“ ”

1.

2.

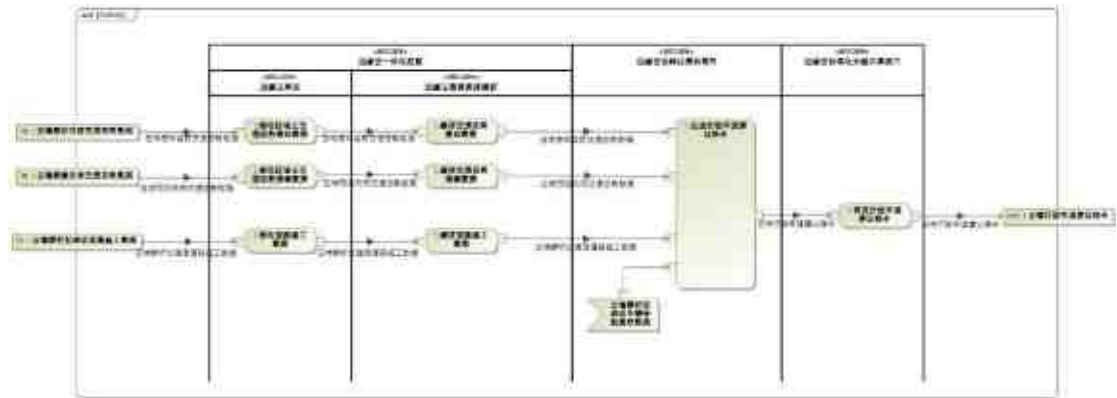
3.

4 “ ”

4-72

“ ”





4-72

“ ”

1.

2.

3.

5

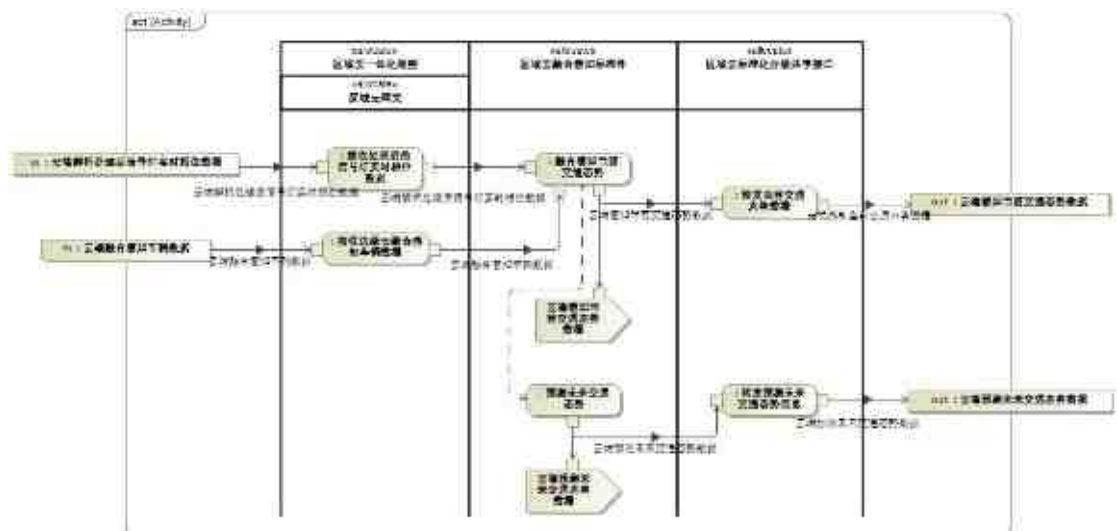
“

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4-73

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4-73

“ ”

1.

2.

3.

6

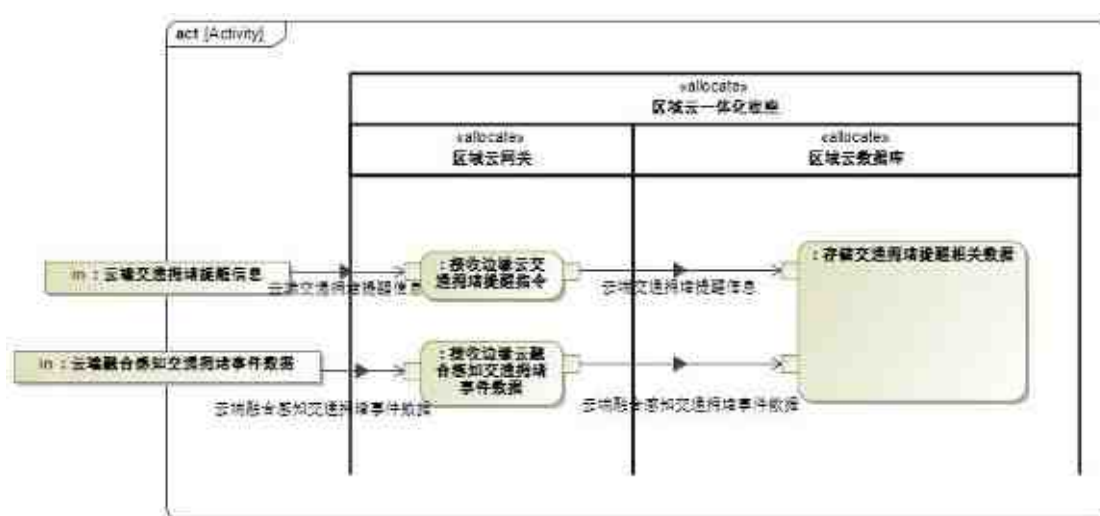
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4-74

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4-74

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1.

2.

4.21

4.21.1

4.21.2

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### 4.21.3

### 4.21.4

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2

3

### 4.21.5

L3

HMI

L4

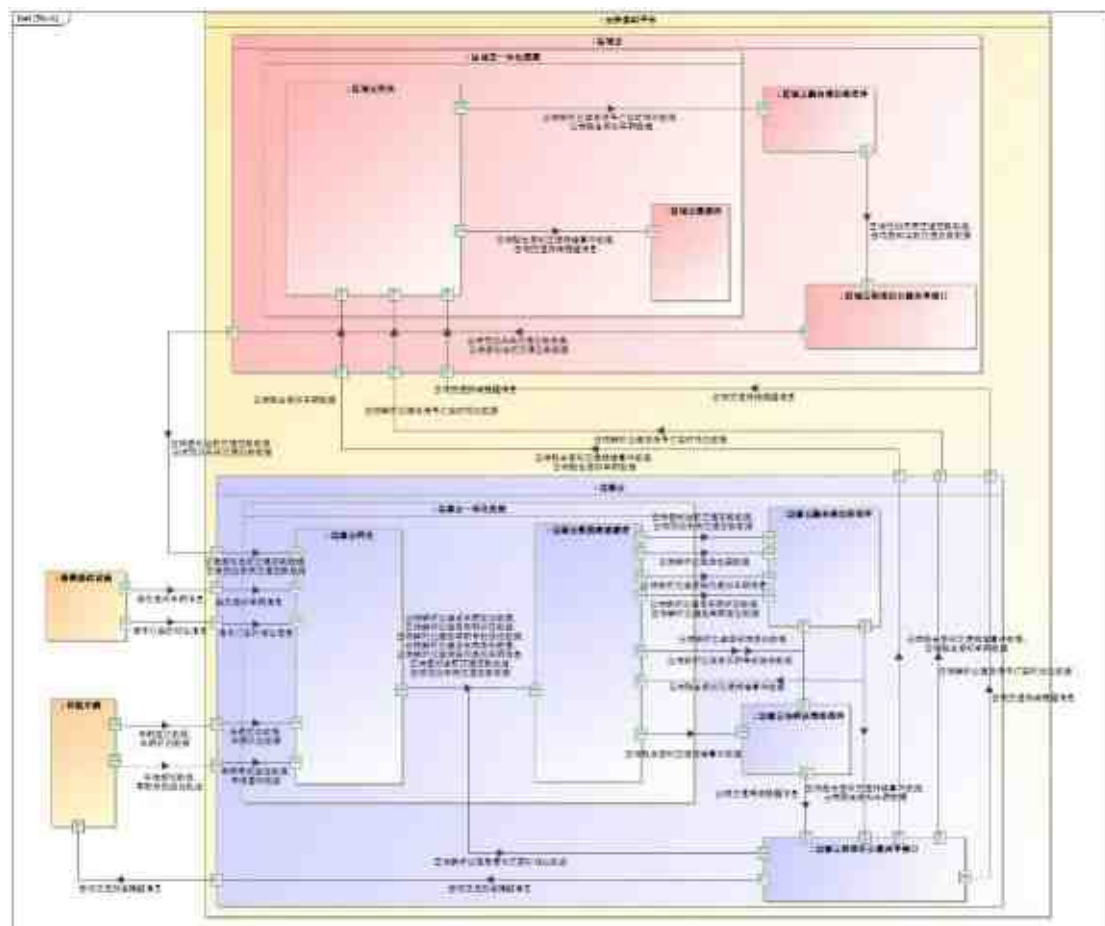
### 4.21.6

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### 4.21.7

1

4-75

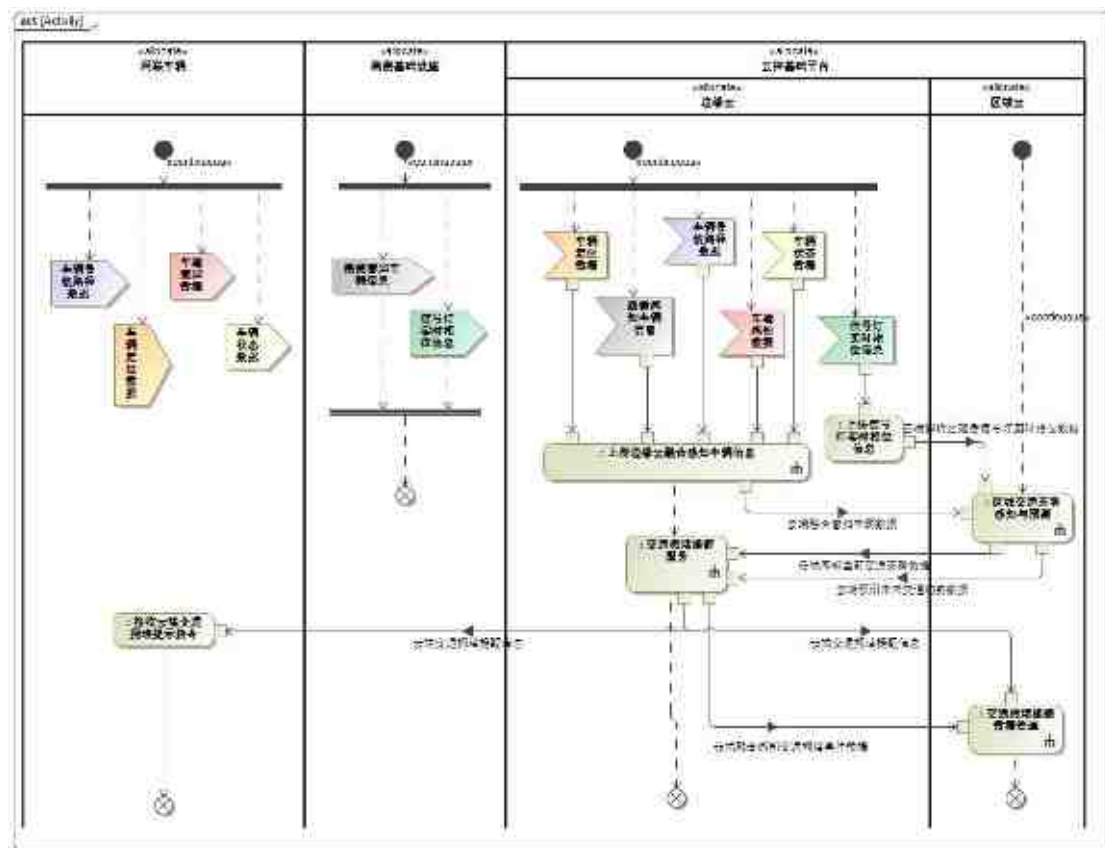


4-75

4-75

2

4-76



4-76

- 1.

- 2.

- 3.

- 4.

- 5.

- 6.

3 “

4-77

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The diagram illustrates the data flow of the edge cloud collaborative perception system, organized into four main functional blocks:

- 边缘云一体化框架 (Edge Cloud Unified Framework):** This block contains the initial data processing and storage steps.
  - 边缘云网关 (Edge Cloud Gateway):** Receives input data (in) and performs initial processing (接收并处理).
    - 车端感知数据 (Vehicle Perception Data):** Input from the vehicle, processed and stored in the **边缘云感知数据缓存 (Edge Cloud Perception Data Cache)**.
    - 车辆定位数据 (Vehicle Location Data):** Input from the vehicle, processed and stored in the **边缘云车辆定位数据缓存 (Edge Cloud Vehicle Location Data Cache)**.
    - 车辆状态数据 (Vehicle Status Data):** Input from the vehicle, processed and stored in the **边缘云车辆状态数据缓存 (Edge Cloud Vehicle Status Data Cache)**.
    - 路侧感知车辆信息 (Roadside Perception Vehicle Information):** Input from the roadside, processed and stored in the **边缘云路侧感知车辆信息缓存 (Edge Cloud Roadside Perception Vehicle Information Cache)**.
    - 车辆导航路线数据 (Vehicle Navigation Route Data):** Input from the vehicle, processed and stored in the **边缘云车辆导航路线数据缓存 (Edge Cloud Vehicle Navigation Route Data Cache)**.
  - 边缘云数据互联互通 (Edge Cloud Data Interconnection):** This block shows the data being processed and stored in the respective caches, with arrows indicating the flow of data between the processing steps and the storage caches.
- 边缘云融合感知条件 (Edge Cloud Collaborative Perception Conditions):** This block contains the **融合感知道路车辆数据 (Fusion Perception Road Vehicle Data)** module, which receives data from the caches and performs fusion processing (融合感知). It also includes a **云端融合感知车辆数据 (Cloud Collaborative Perception Vehicle Data)** output.
- 边缘云标准化数据共享接口 (Edge Cloud Standardized Data Sharing Interface):** This block contains the **转发边缘云融合感知车辆信息 (Forward Edge Cloud Collaborative Perception Vehicle Information)** module, which receives data from the fusion processing module and outputs it to the final **out: 云端融合感知车辆数据 (Cloud Collaborative Perception Vehicle Data)**.

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2.

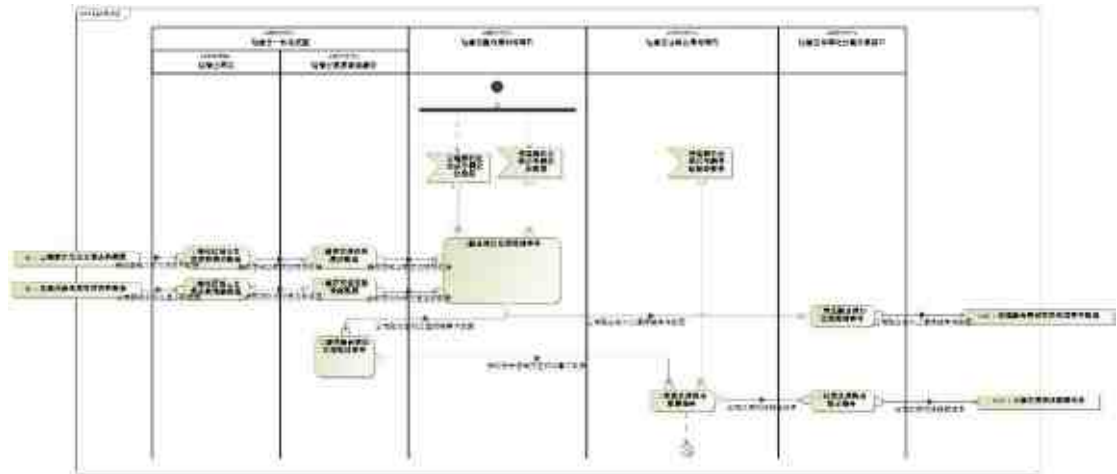
3.

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99



4-78 -

1.

2.

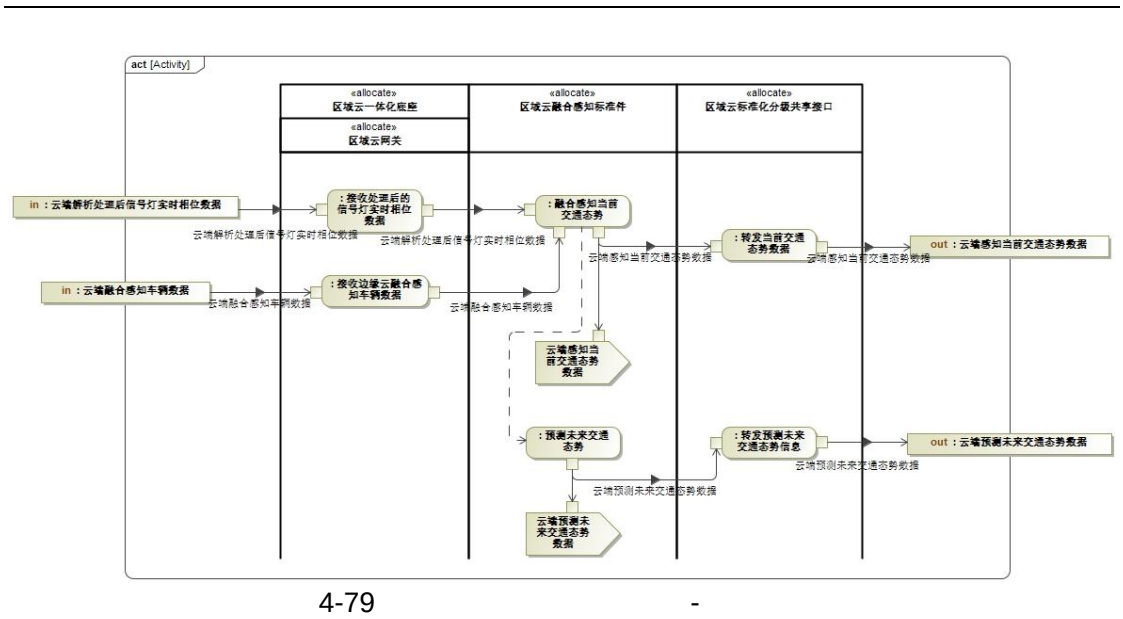
3.

4

5 “ ”

4-79 “

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“ ”

1.

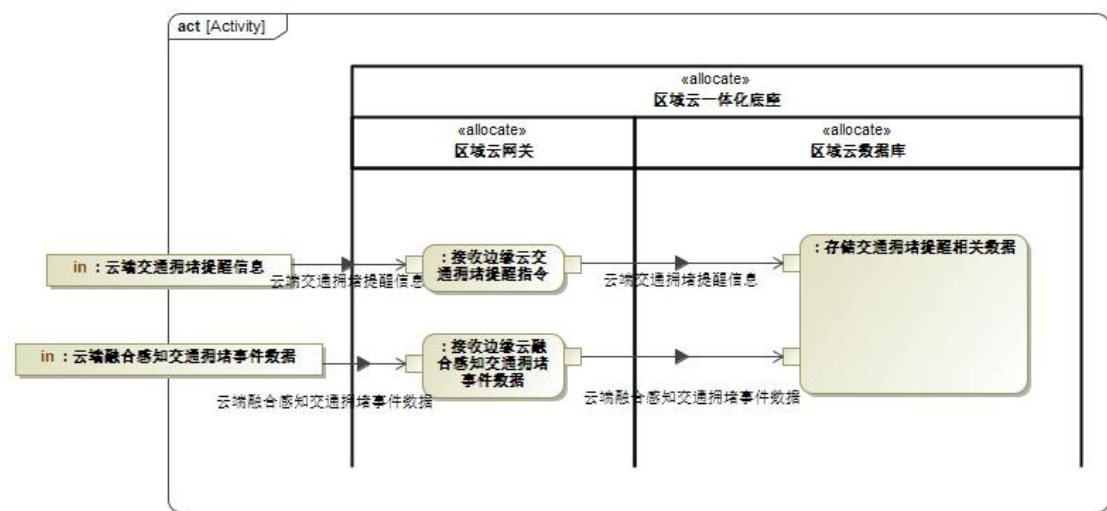
2.

3.

6 “ ”

4-80

“ ”



“ ”



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1.

2.

4.22

4.22.1

4.22.2

4.22.3

4.22.4

1

2

3

4.22.5

L3

HMI

HMI

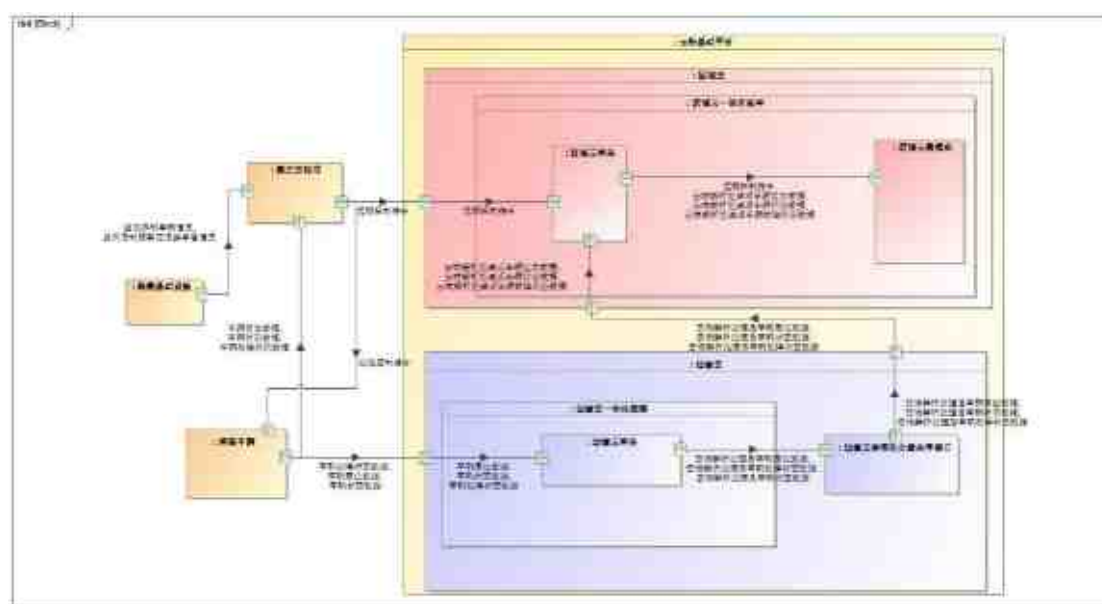
4.22.6

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#### 4.22.7

1

4-81

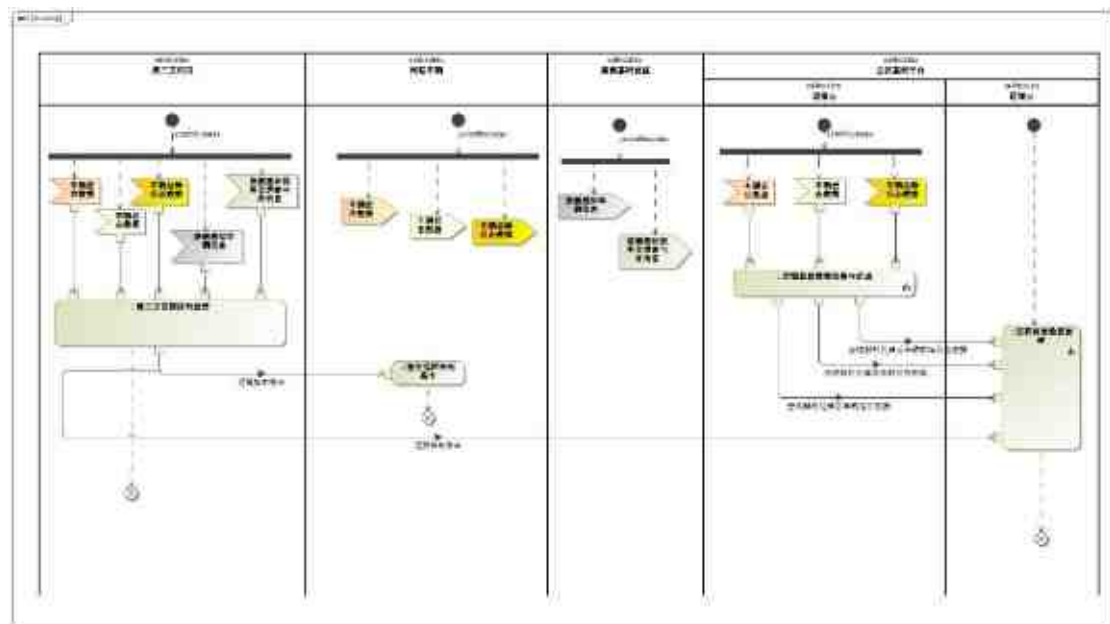


4-81

4-81

2

4-82



4-82

1.

2.

3.

4.

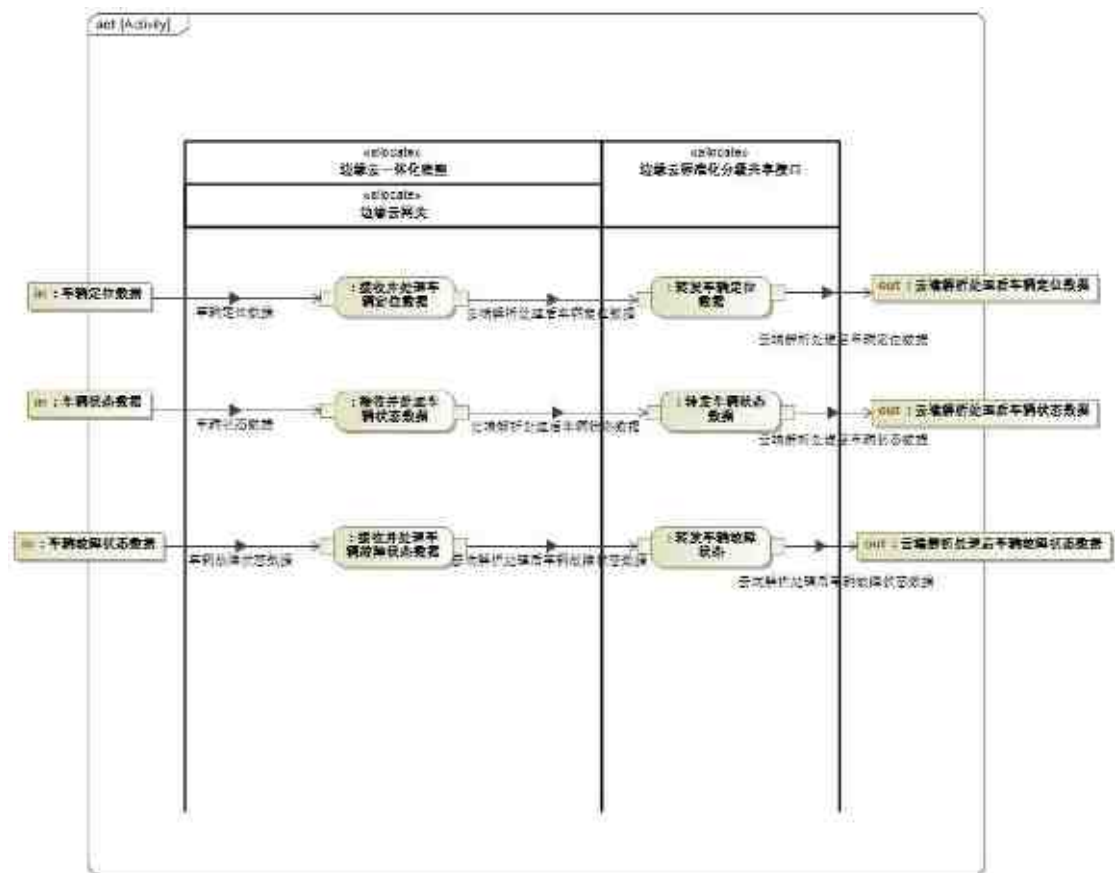
3 “

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4-83

“

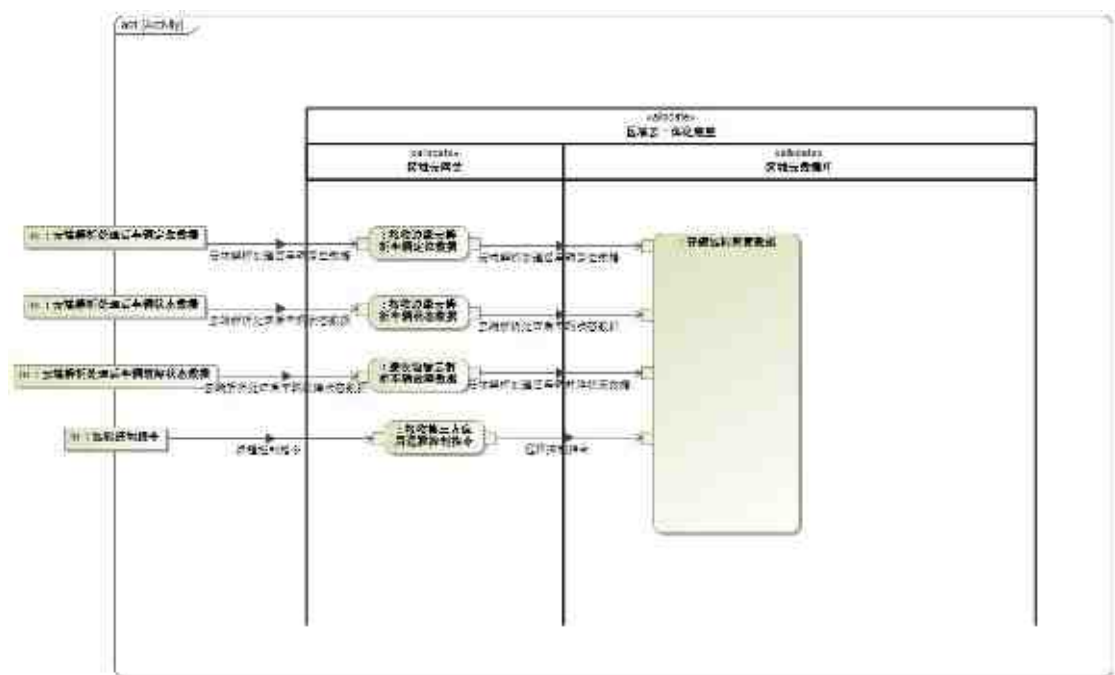
”



4-83

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4-84



4-84

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|--|--------|-----|--|
|  | “      | ”   |  |
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|  | 2.     |     |  |
|  | 4.23   |     |  |
|  | 4.23.1 |     |  |
|  |        |     |  |
|  | 4.23.2 |     |  |
|  |        |     |  |
|  | 4.23.3 |     |  |
|  |        |     |  |
|  | 4.23.4 |     |  |
|  | 1      |     |  |
|  | 2      |     |  |
|  |        |     |  |
|  | 4.23.5 |     |  |
|  | L3     | HMI |  |
|  | L4     |     |  |

4.23.6

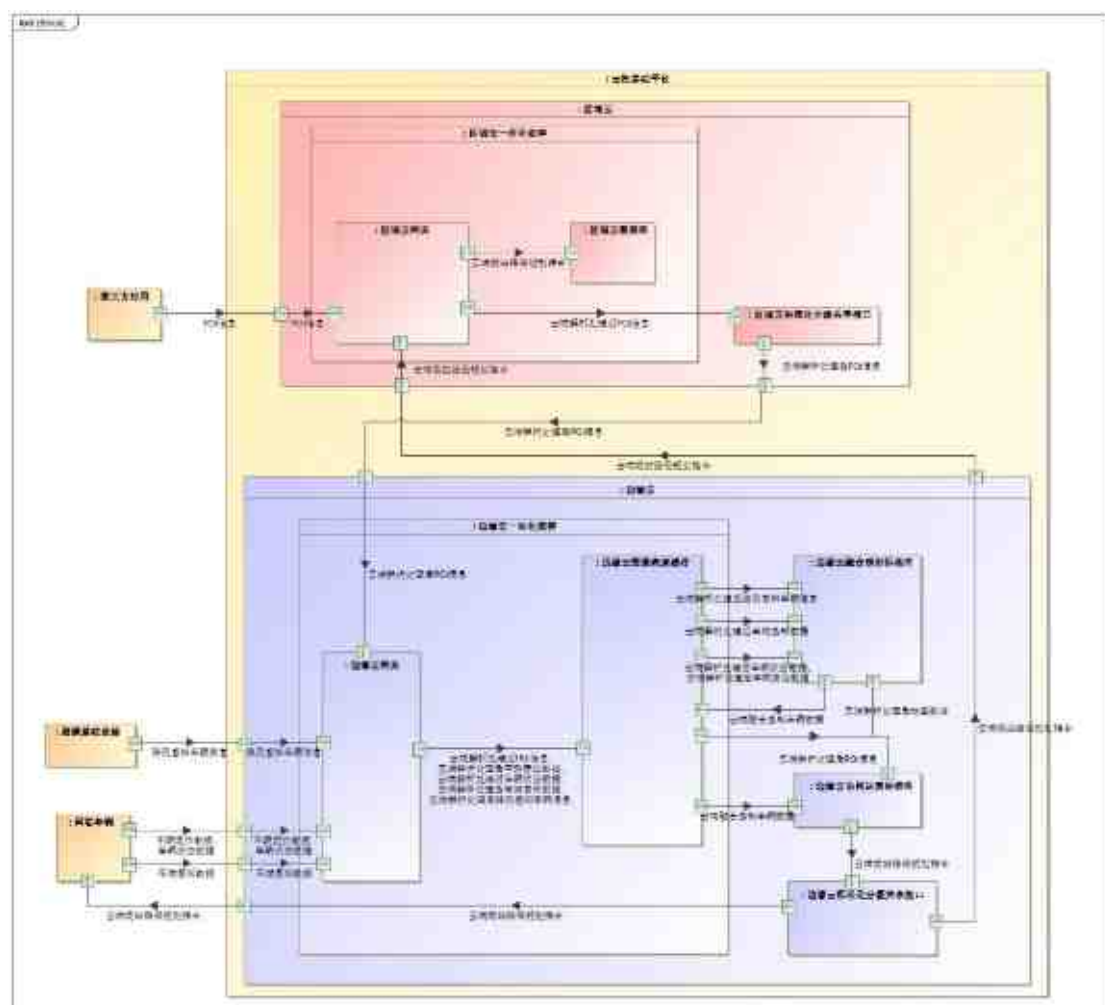
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P0I

4.23.7

1

4-85



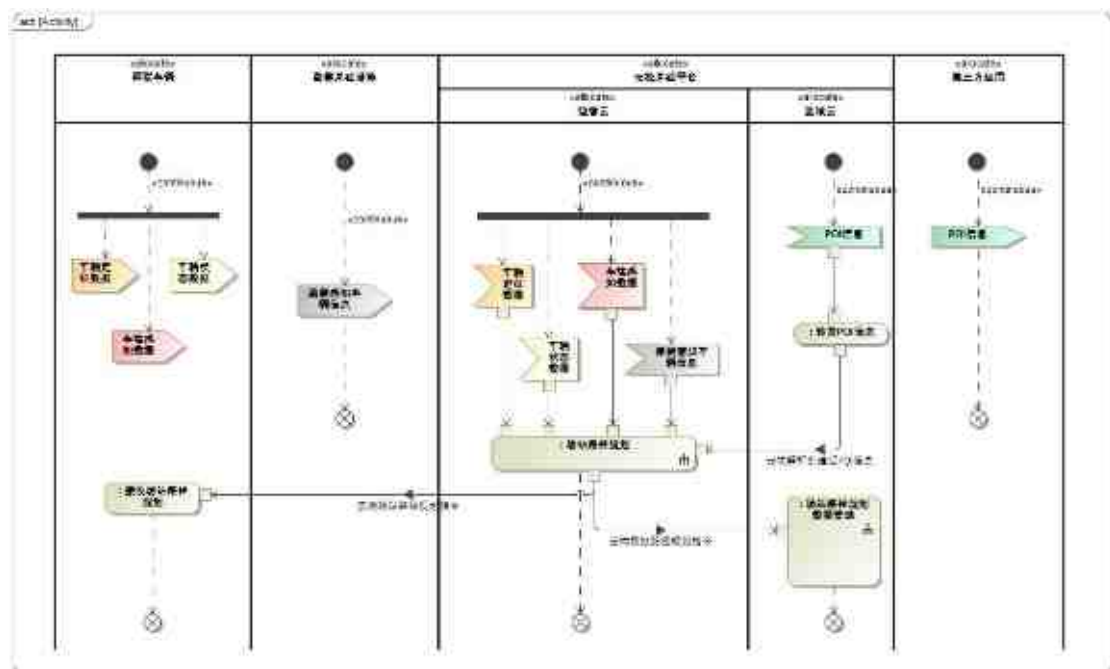
4-85

POI

POI

2

4-86



4-86

1.

POI

2.

3.

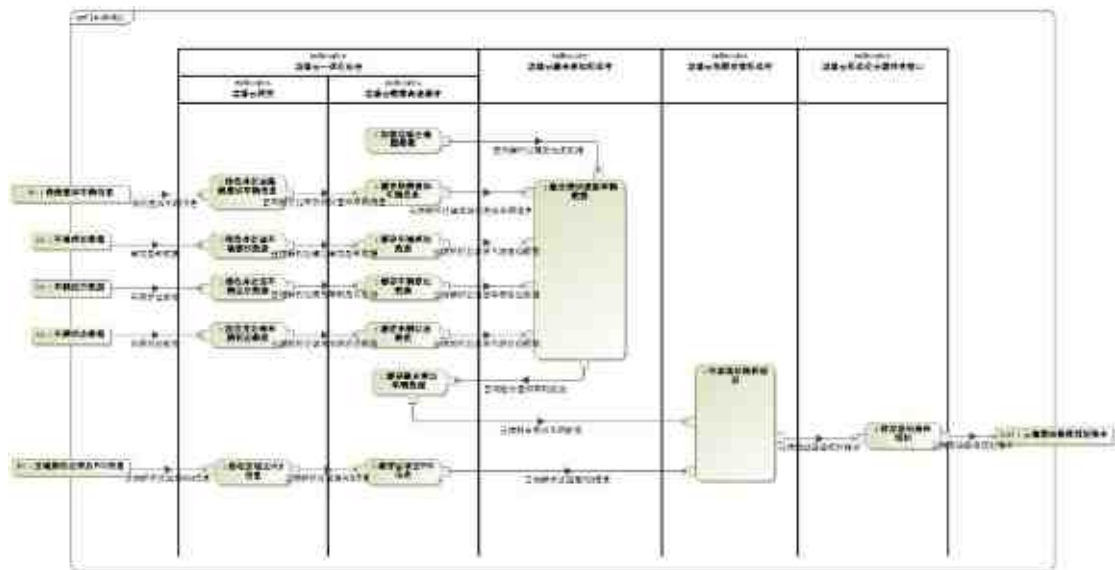
4.

3 “ ”

4-87

“

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4-87

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“ ”

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POI

2.

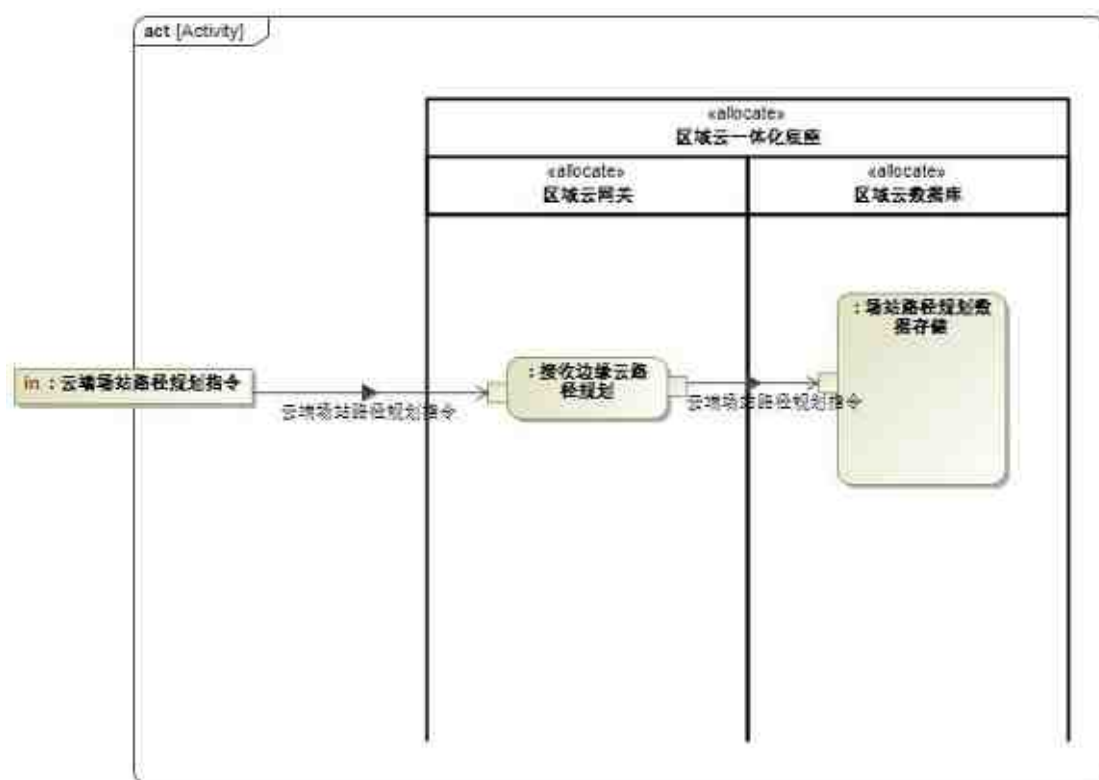
3.

POI

4.

4 “ ”





4-88

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“ ”

- 1.
- 2.

## 4.24C-AEB

### 4.24.1

### 4.24.2

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### 4.24.3

### 4.24.4

1

2

### 4.24.5

L3

HMI

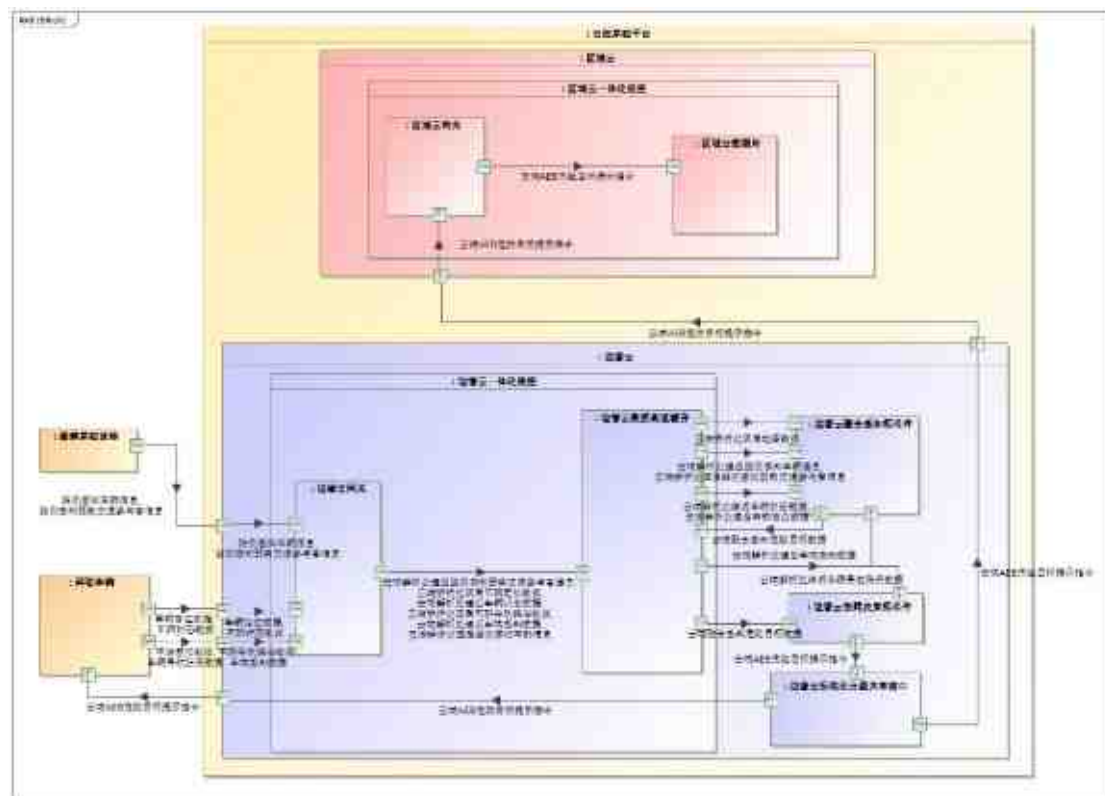
L4

### 4.24.6 /

### 4.24.7

1

C-AEB



4-89 C-AEB

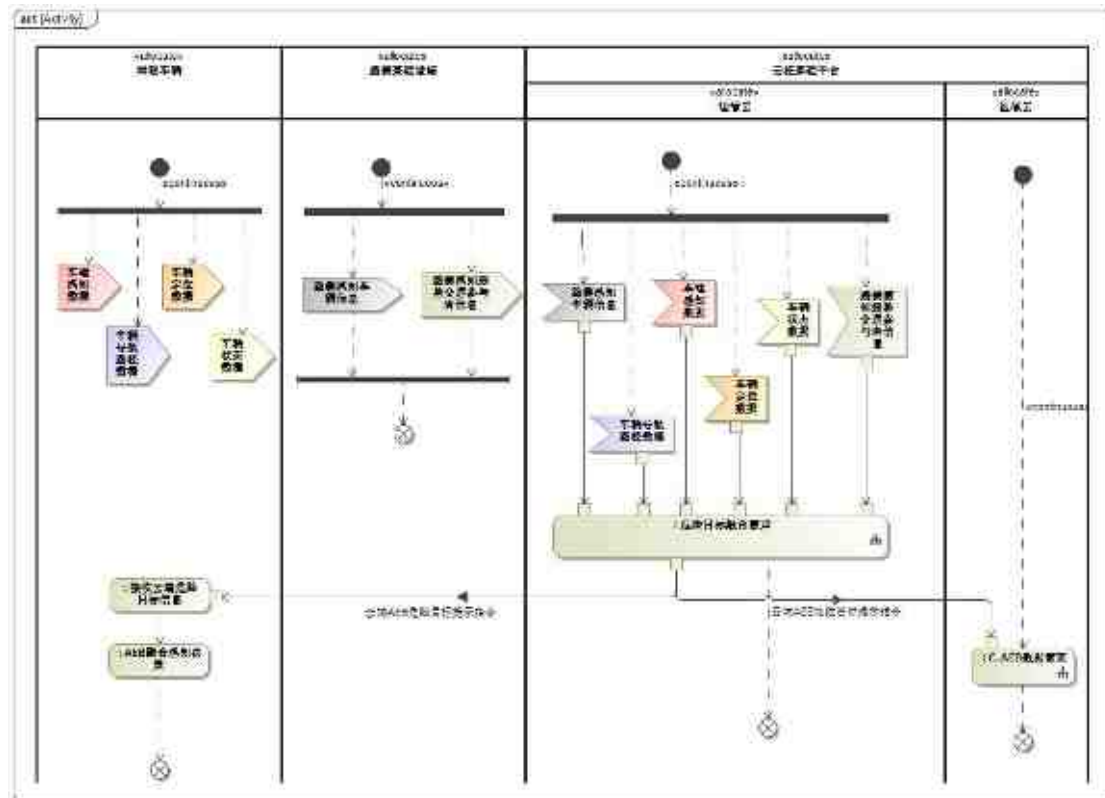
4-89

AEB

2

4-90

C-AEB



C-AEB

- 1.
- 2.
- 3.
- 4.
- 3

AEB

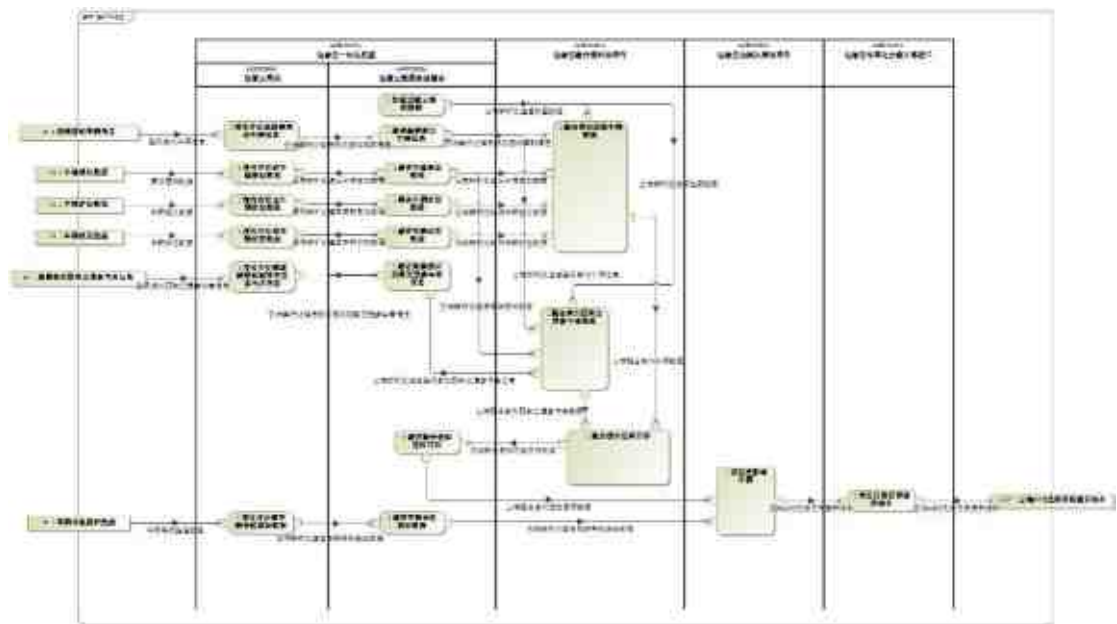
4-91

C-AEB

“

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AEB



4-91

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“ ”

1.

2.

3.

AEB

4.

AEB

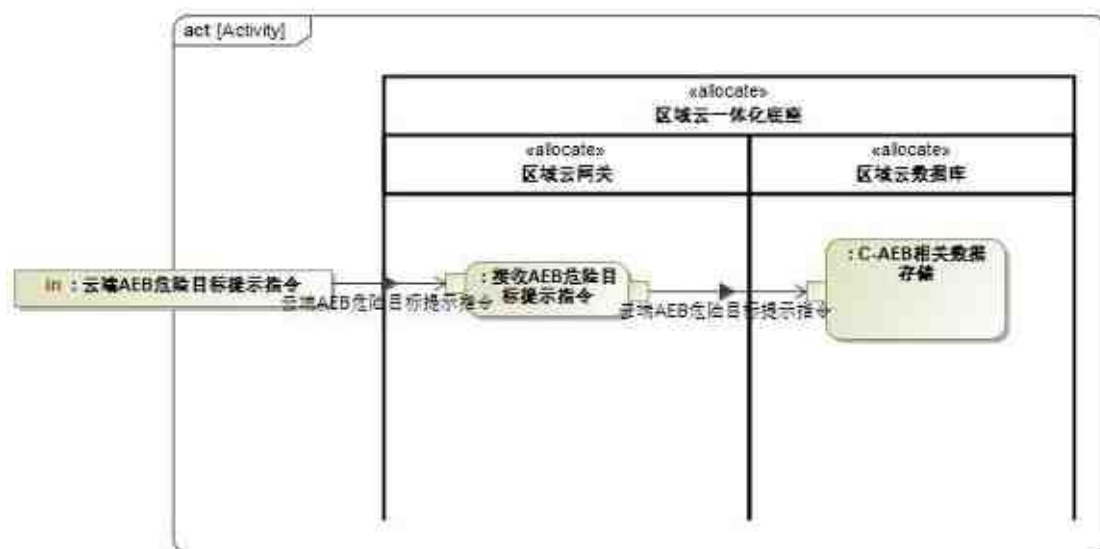
4 “ C-AEB ”

4-92

C-AEB

“ C-AEB

”



4-92 C-AEB

“ C-AEB

- 1.
- 2.

AEB

## 4.25C-ACC

### 4.25.1

C-V2X      C-ACC      ACC

### 4.25.2

### 4.25.3

ACC

### 4.25.4

1

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2

ACC

4.25.5

L3

HMI

ACC

L4

ACC

4.25.6

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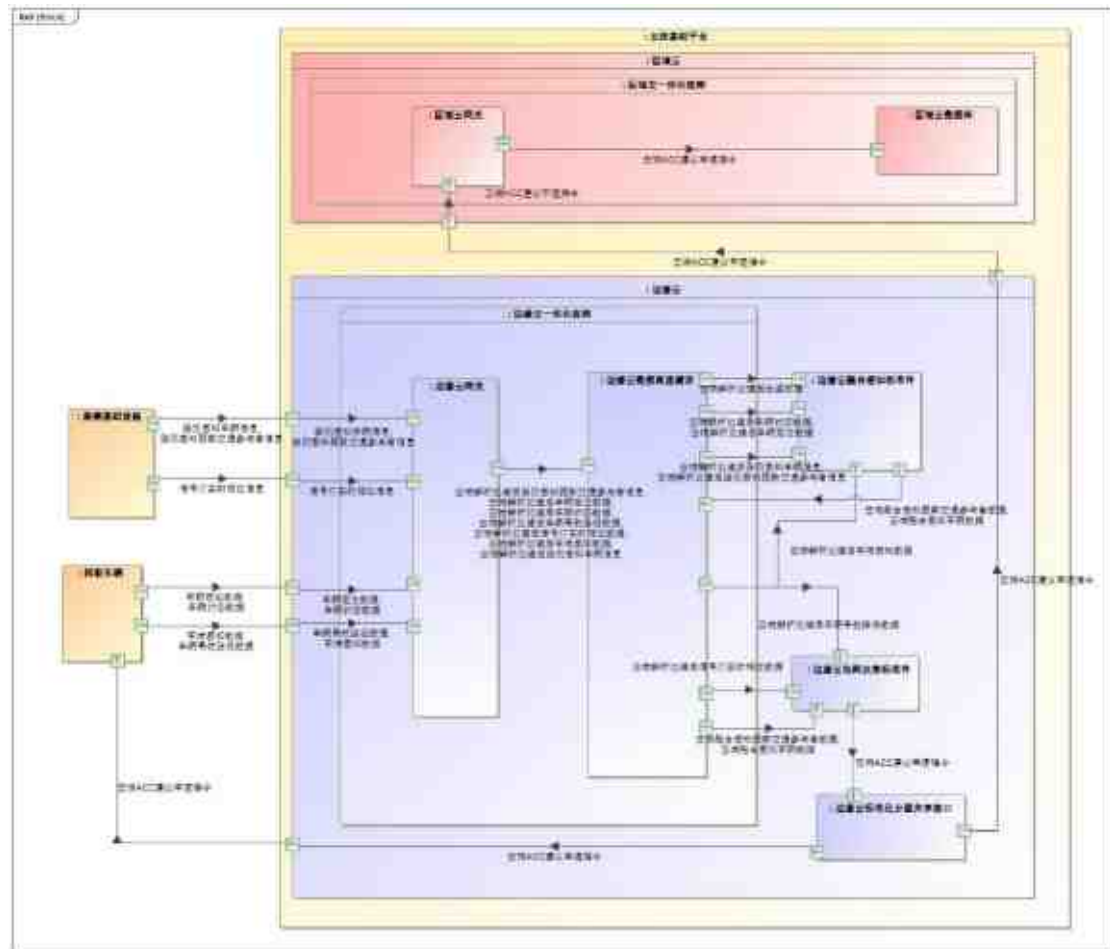
ACC

4.25.7

1

4-93

C-ACC



4-93 C-ACC

4-93

ACC

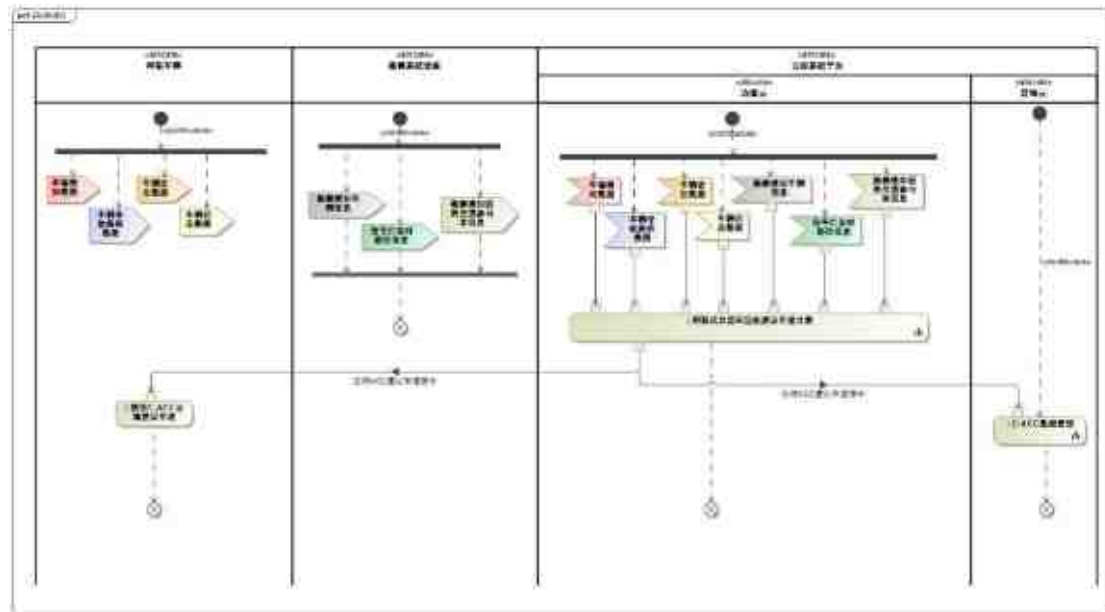
2

4-94

C-ACC

C-ACC





4-94 C-ACC

C-ACC

1.

2.

3.

C-ACC

4.

3 “

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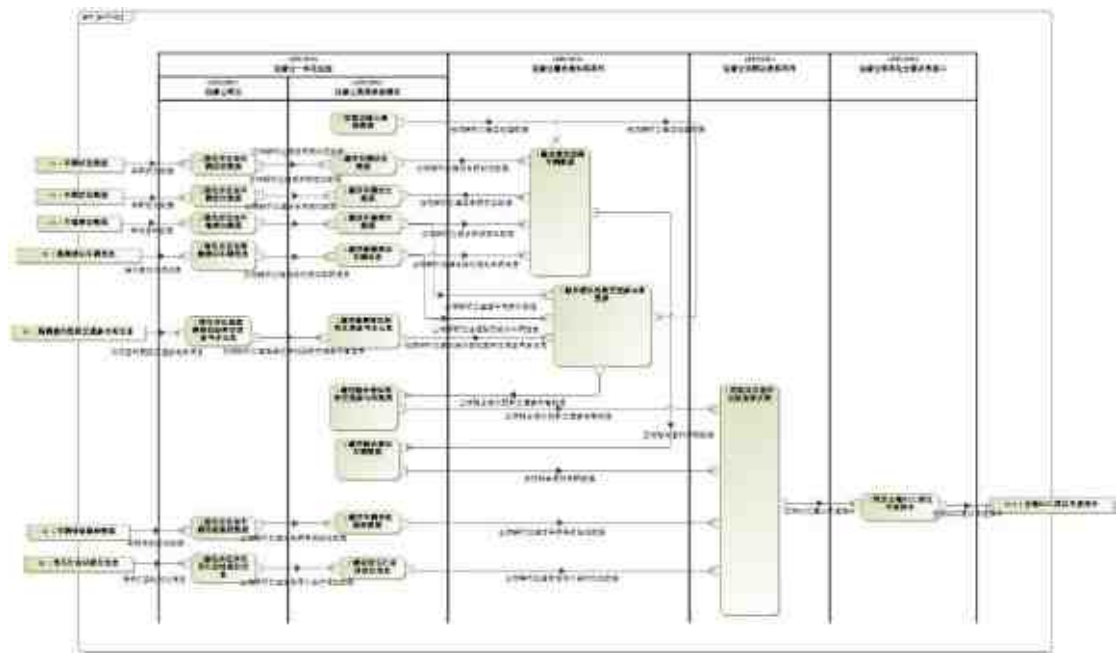
4-95

C-ACC

“

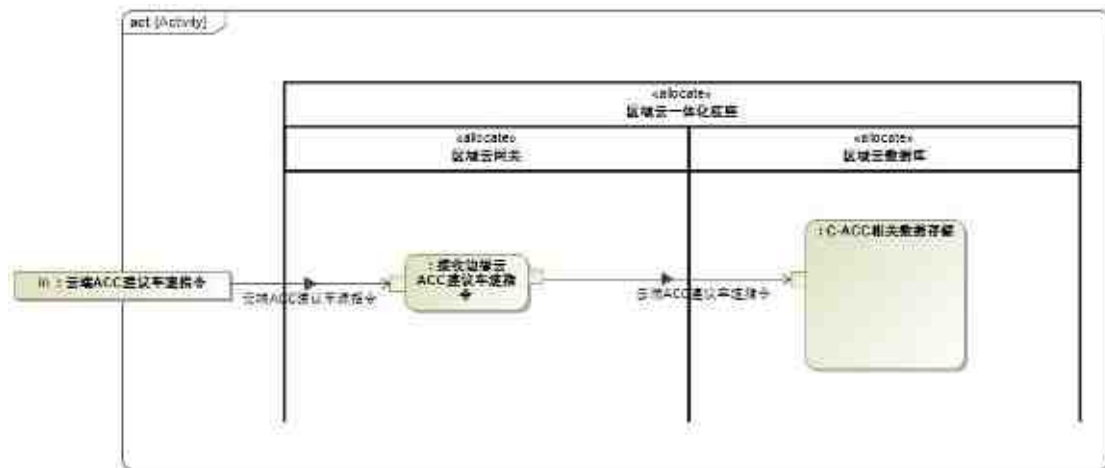
”

ACC



4-95

- “ ”
- 1.
  - 2.
  - 3.
  4. ACC
  4. ACC
  - 4 “ C-ACC ”
  - 4-96 C-ACC “ C-ACC ”



4-96 C-ACC

“ C-ACC

1.

ACC

2.

## 4.26C-AVP

### 4.26.1

/RSU

### 4.26.2

### 4.26.3

### 4.26.4

1

2

3

4

C-AVP

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4.26.5

L4

4.26.6 /

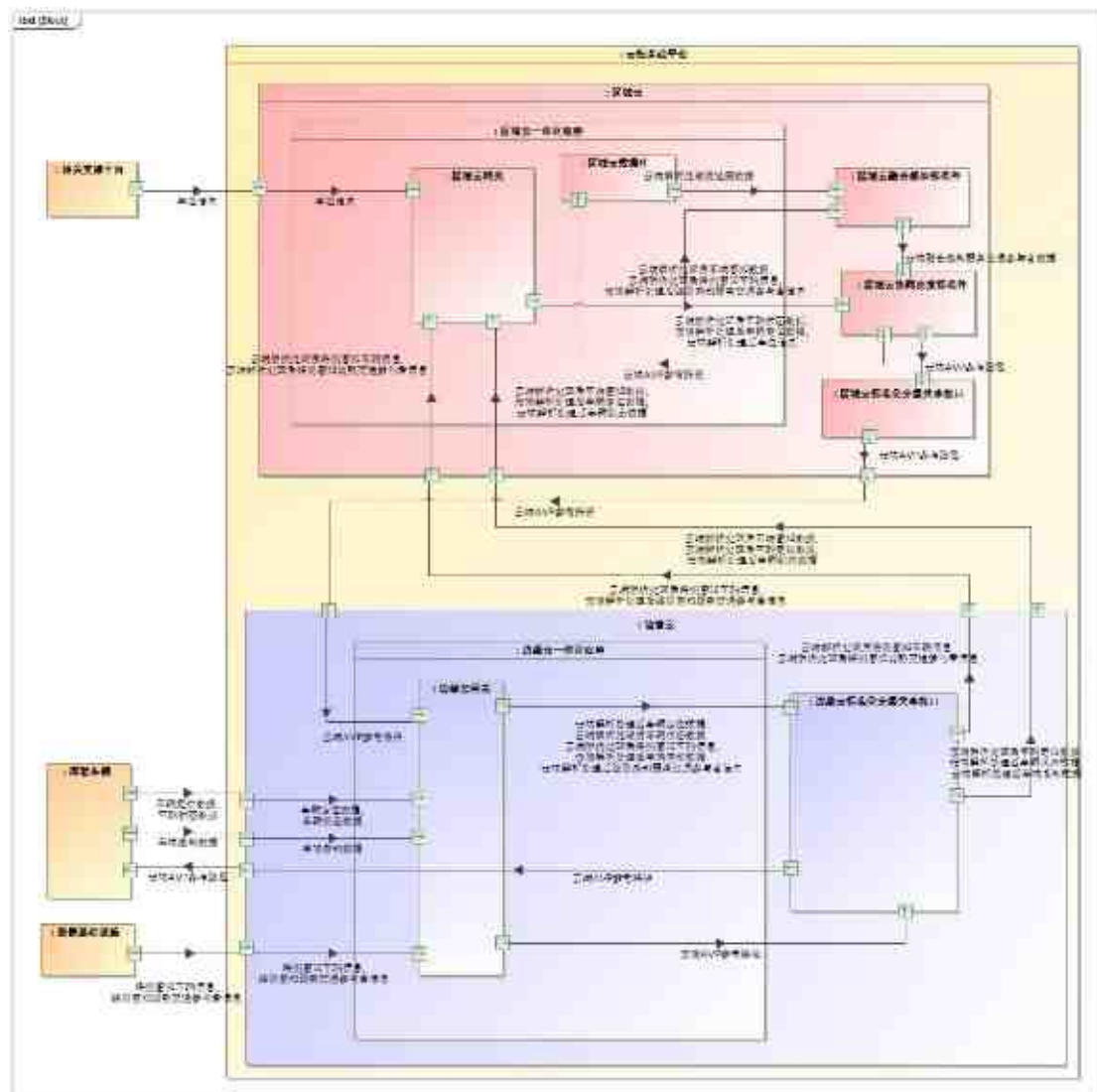
C-AVP

4.26.7

1

4-97

C-AVP



4-97 C-AVP

4-97

AVP

AVP

2

4-98

C-AVP

C-AVP

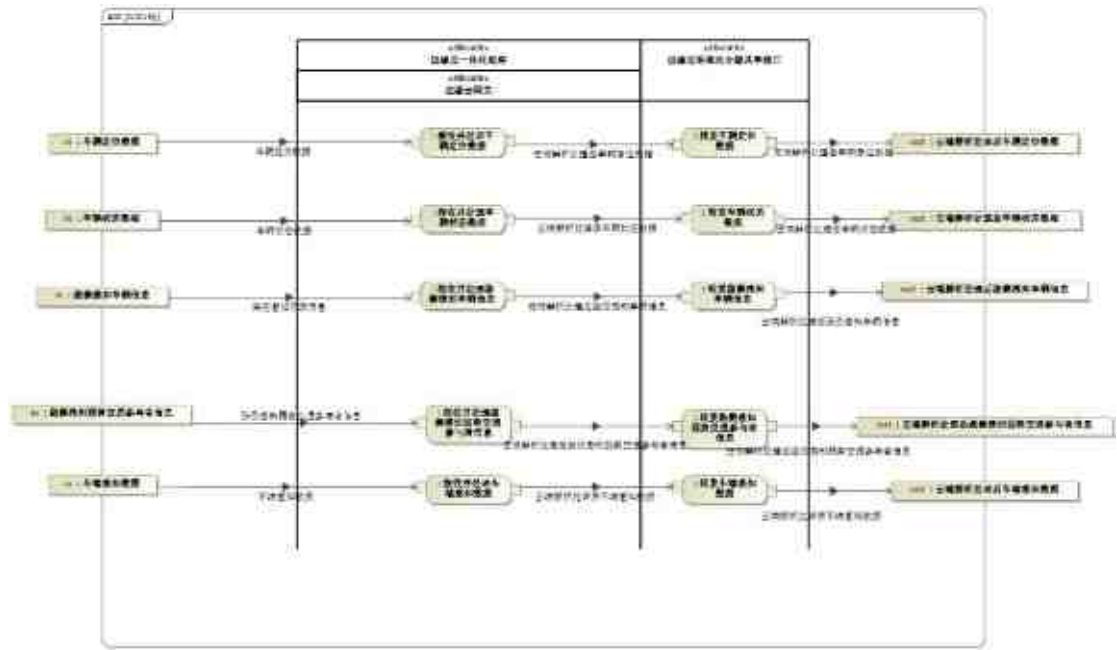
2.

AVP

4.

3 “ C-AVP

“ C-AVP



4-99 C-AVP

“ C-AVP ”

1.

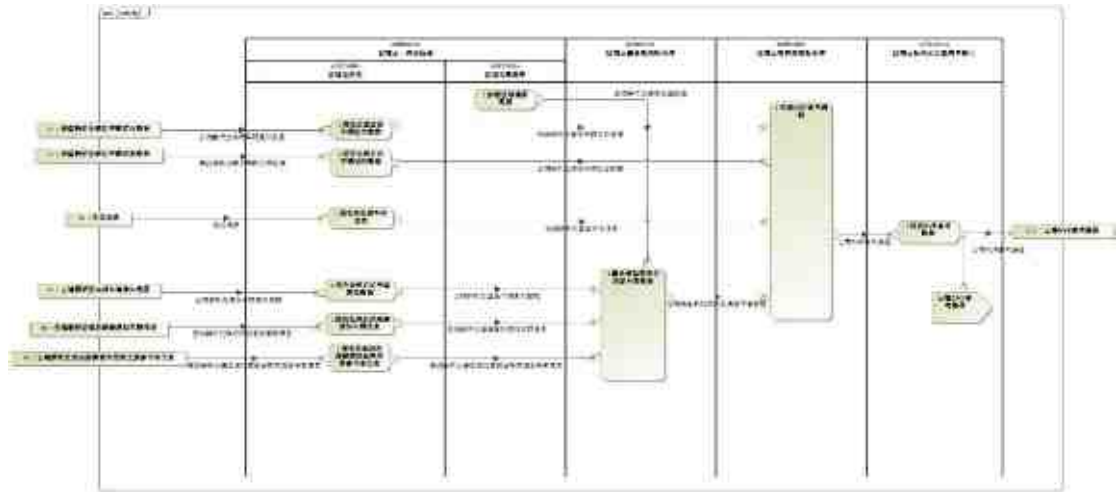
2.

4 “ C-AVP ”

4-100

“ C-AVP ”

AVP



4-100 C-AVP

“ C-AVP ” :

1.

2.

3.

4.

AVP

5.

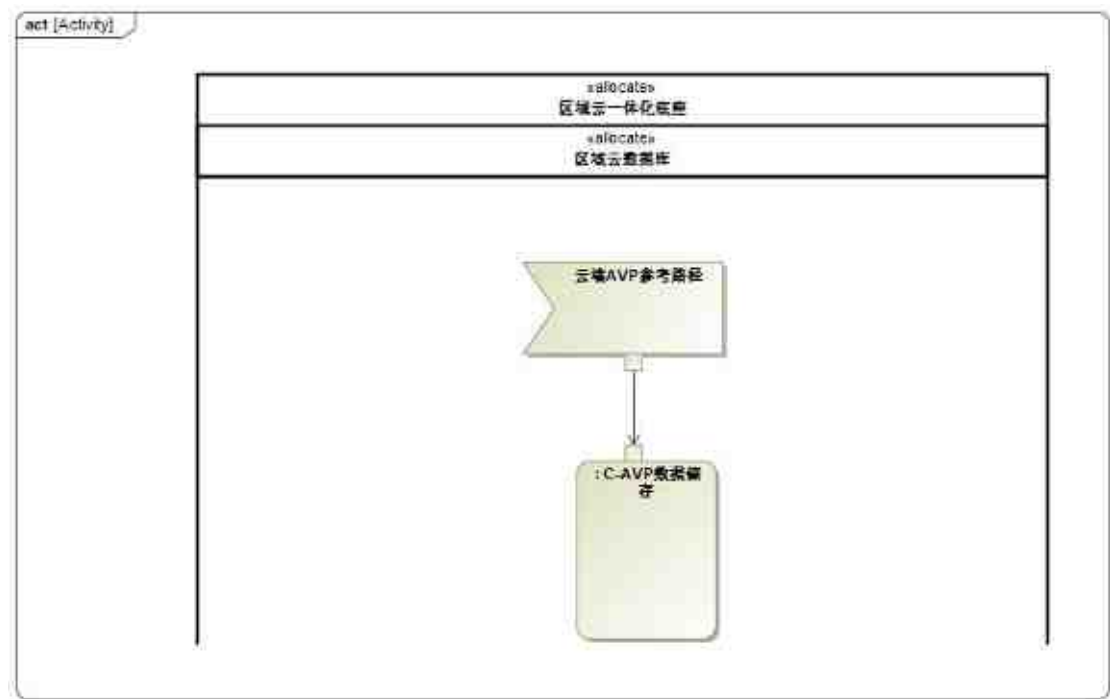
AVP

5 “ C-AVP ”

4-101

“ C-AVP ”





4-101 C-AVP -

“ ”  
1. AVP

4.27

4.27.1

4.27.2

4.27.3

4.27.4

1

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2

4.27.5

L3

HMI

L4

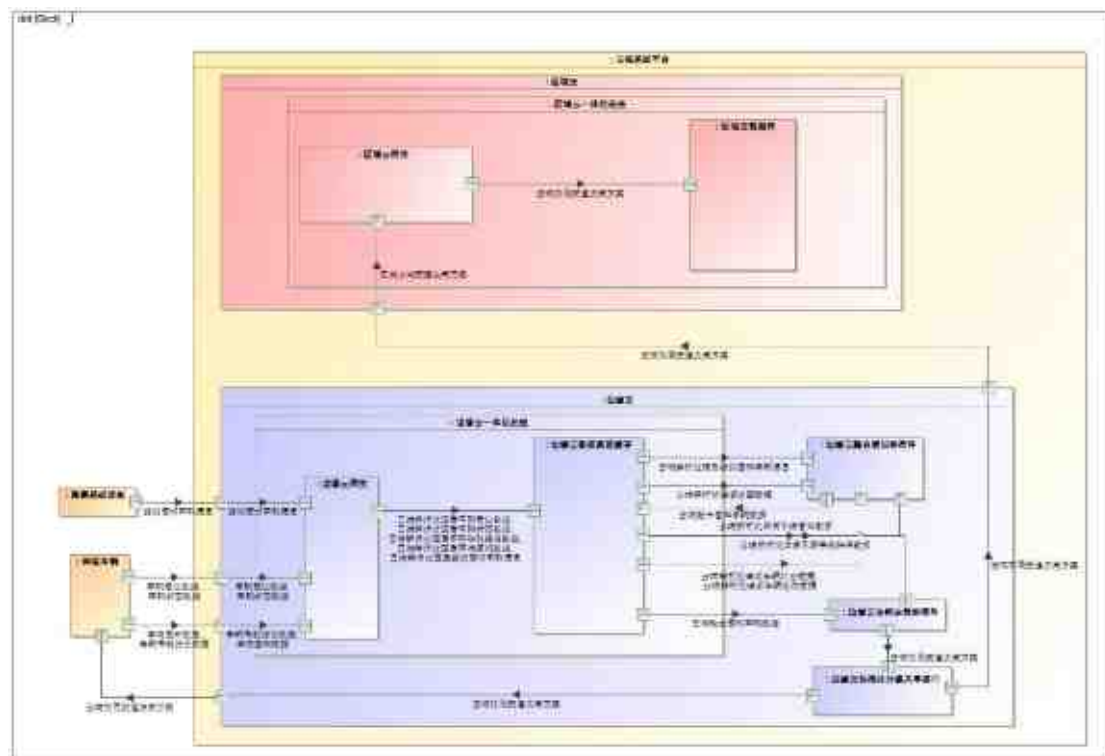
4.27.6

/

4.27.7

1

4-102

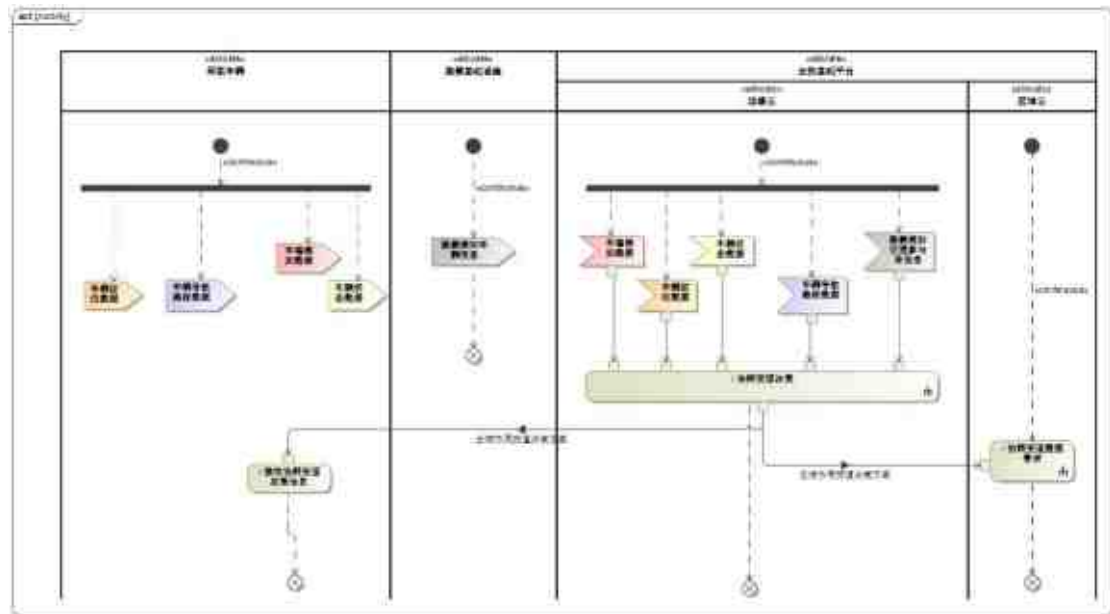


4-102

4-102

2

4-103



4-103

1.

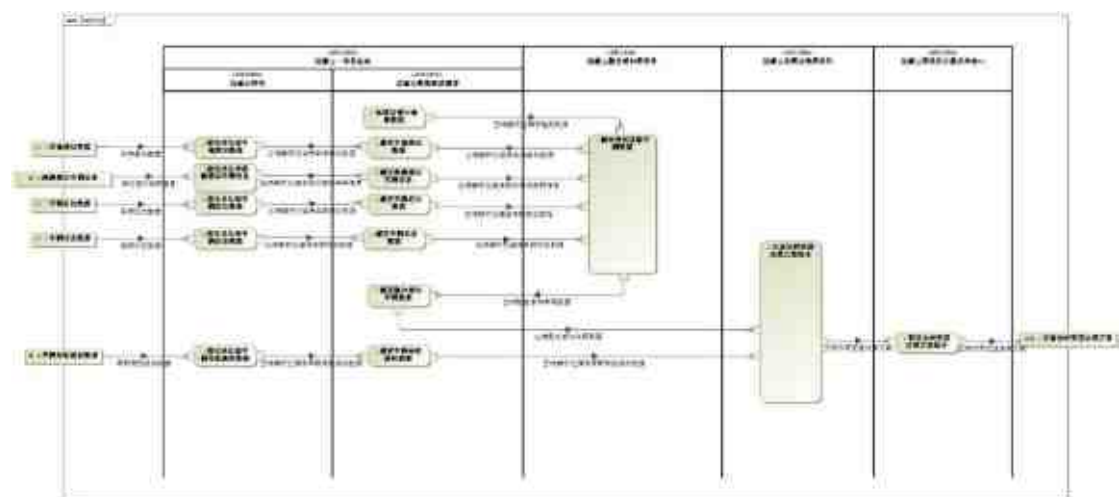
2.

3.

3 “ ”

4-104

“ ”



4-104

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“ ”

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2.

3.

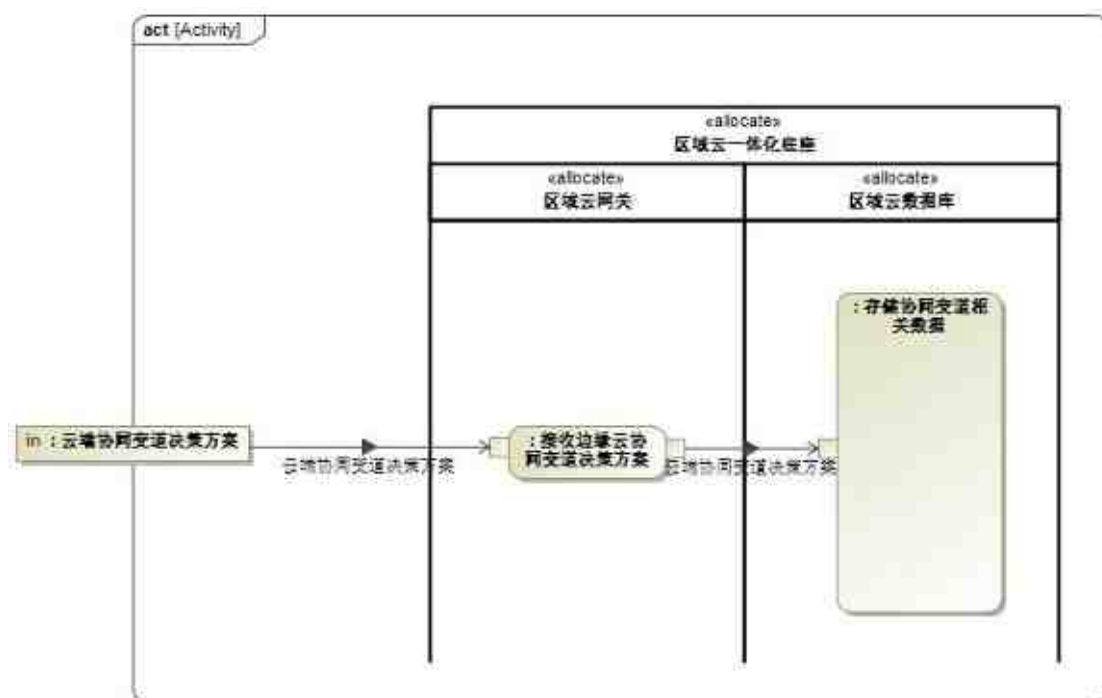
4.

4 “ ”

4-105

“

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4-105

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“ ”

- 1.
- 2.

4.28

4.28.1

4.28.2

4.28.3

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#### 4.28.4

1

2

#### 4.28.5

L3

HMI

L4

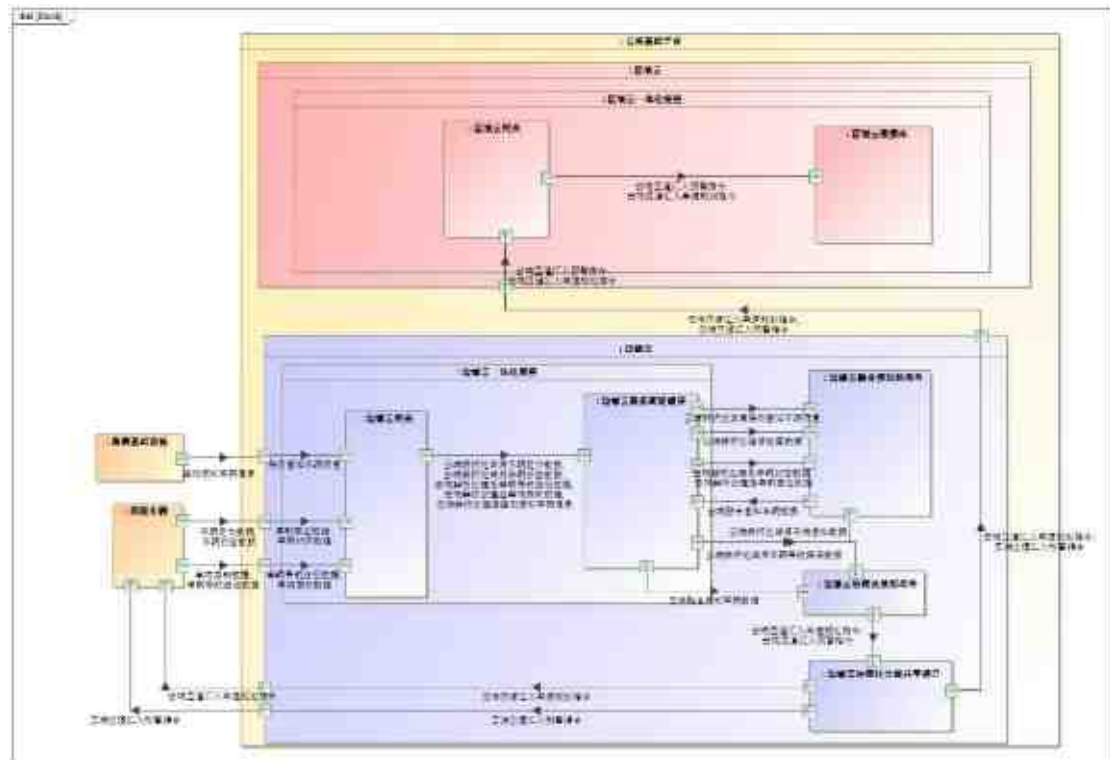
#### 4.28.6

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#### 4.28.7

1

4-106



4-106

4-106

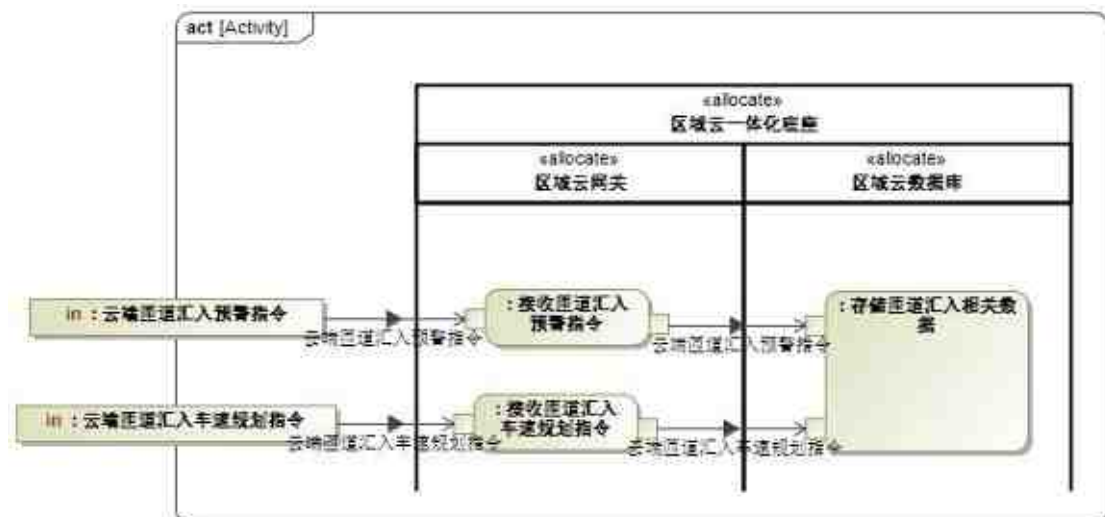
2

4-107









4-109

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“ ”

1.

2.

4.29

4.29.1

4.29.2

4.29.3

4.29.4

1

2

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#### 4.29.5

L3

HMI

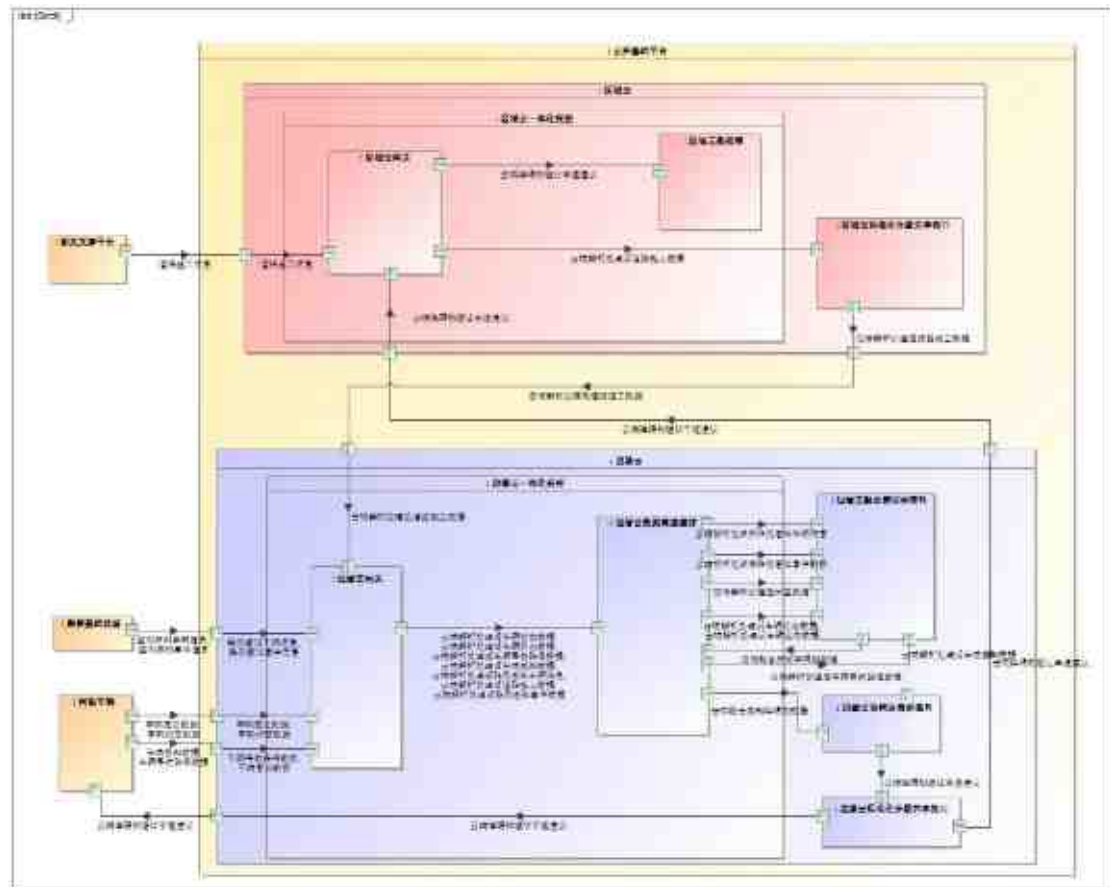
L4

#### 4.29.6 /

#### 4.29.7

1

4-110



4-110

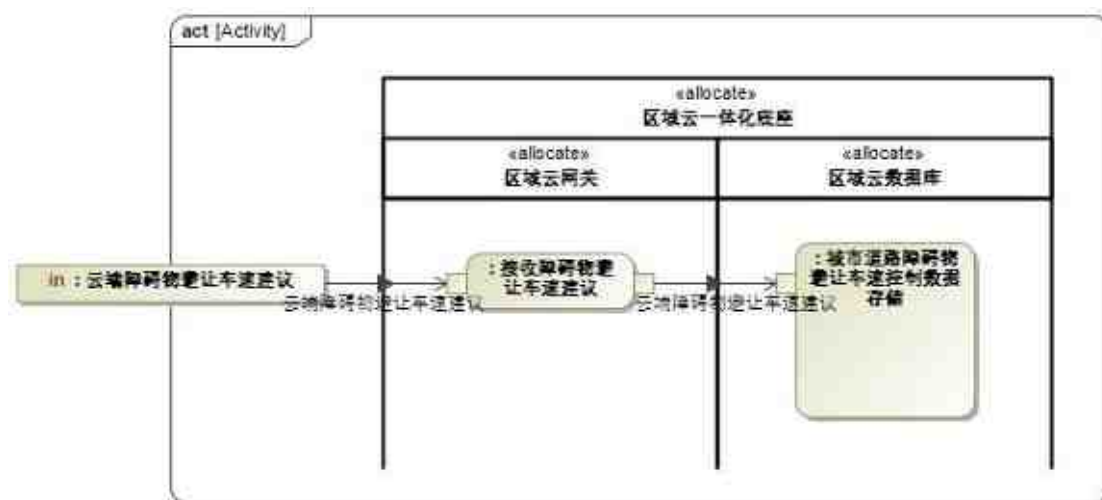
4-110

2

4-111







4-113

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“ ”

- 1.
- 2.

4.30

4.30.1

4.30.2

4.30.3

4.30.4

1

2



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#### 4.30.5

L3

HMI

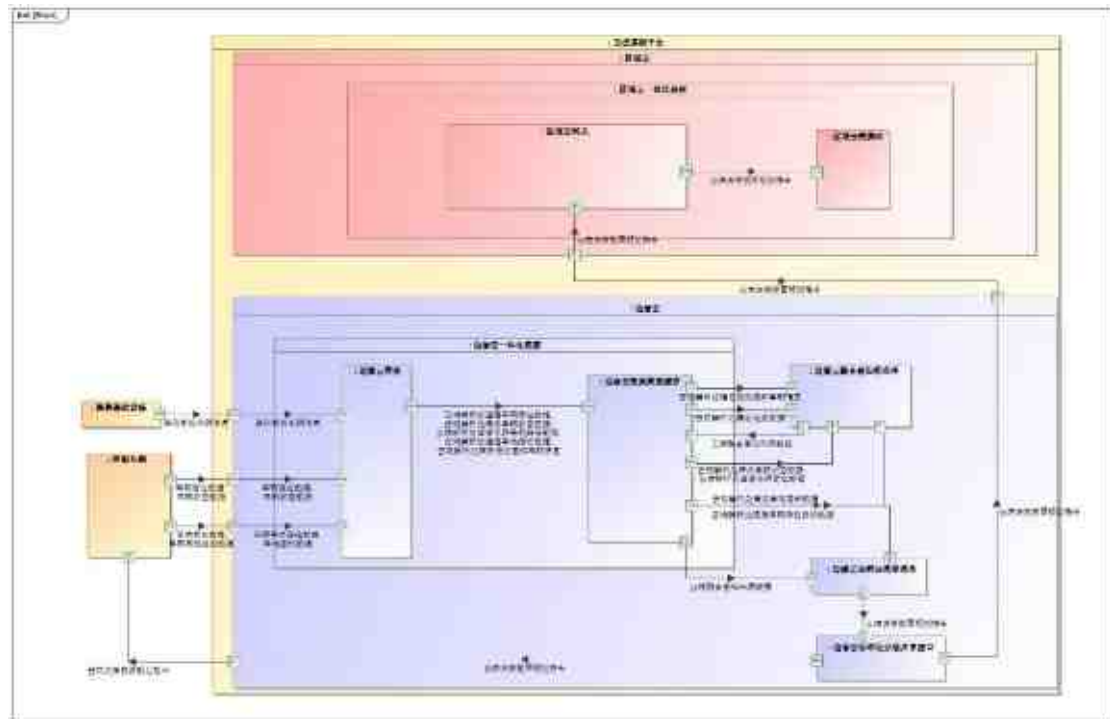
L4

#### 4.30.6 /

#### 4.30.7

1

4-114

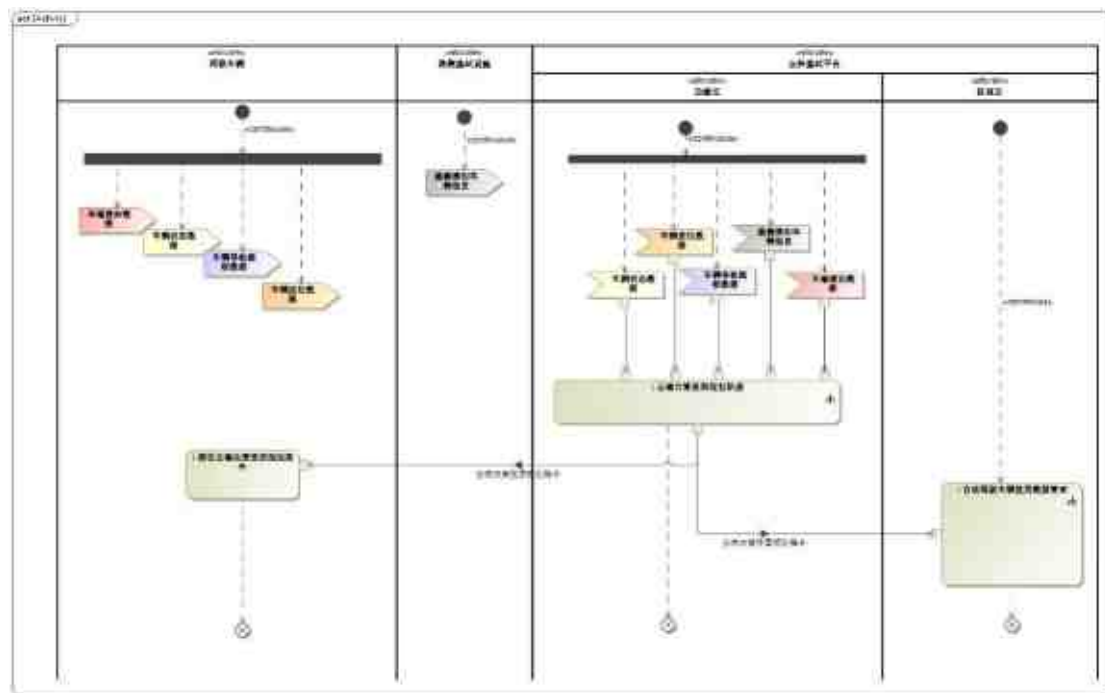


4-114

4-114

2

4-115



1.

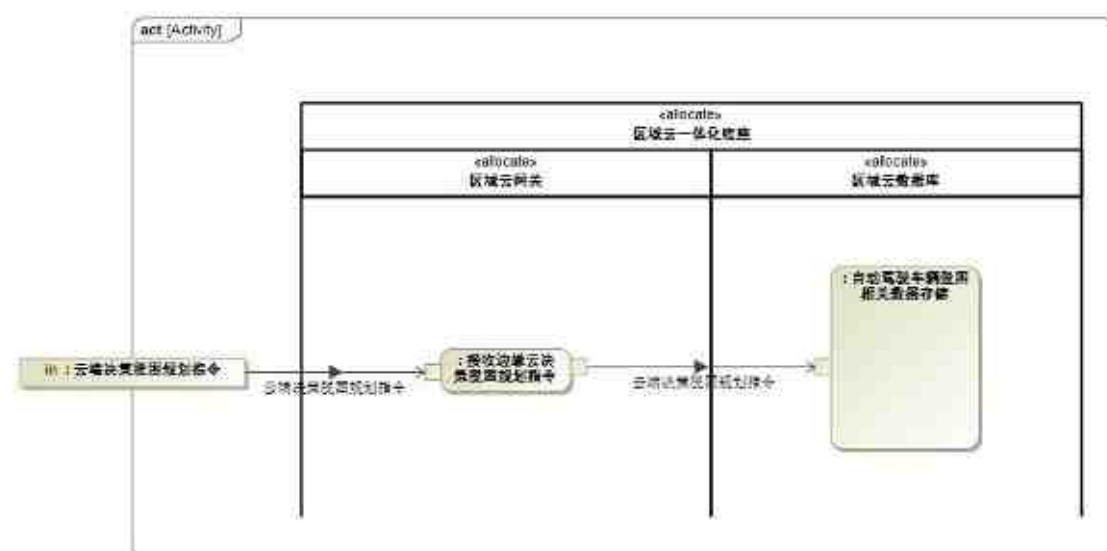
2.

3.

3 “ ”

4-116 " "





4-117

“ ”

- 1.
- 2.

## 4.31

### 4.31.1

RSU

### 4.31.2

### 4.31.3

### 4.31.4

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2

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3  
4

#### 4.31.5

L3

HMI

HMI

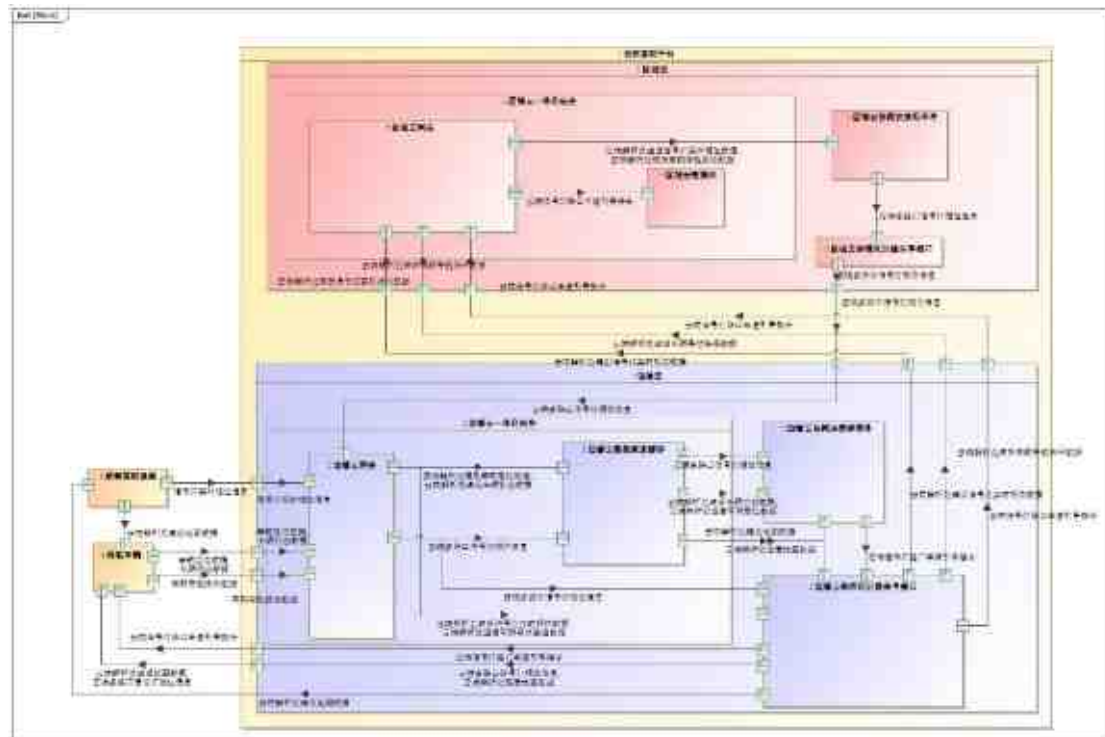
L4

#### 4.31.6 /

#### 4.31.7

1

4-118

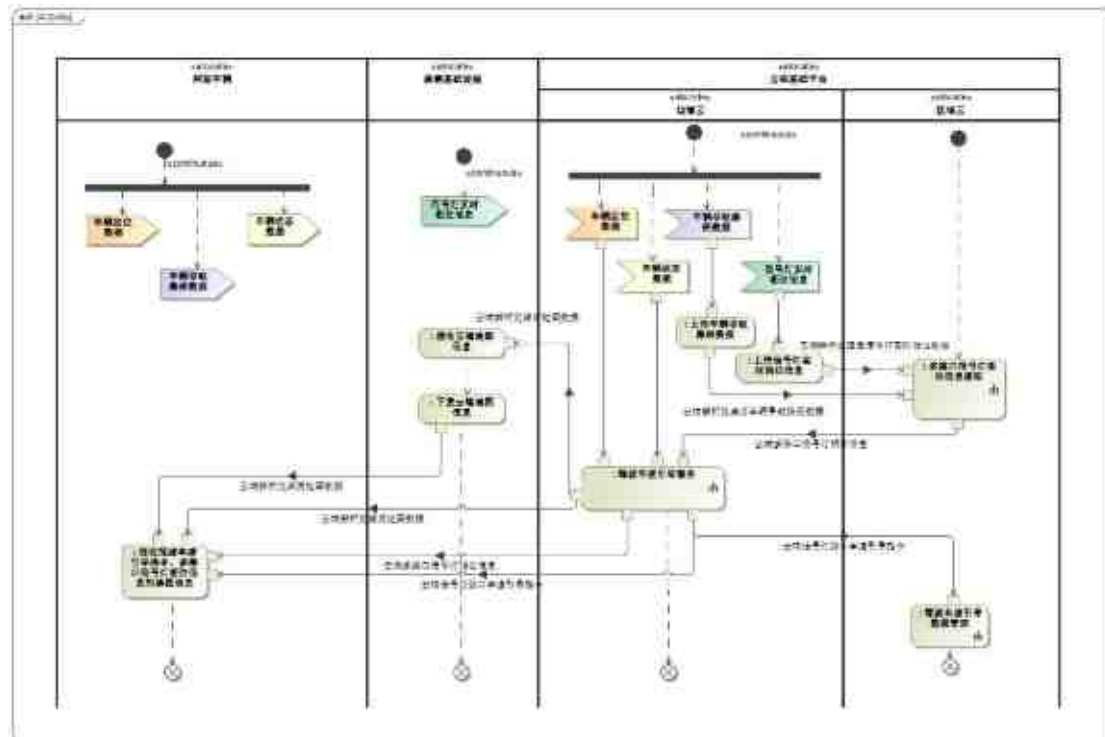


4-118

4-118

2

4-119



4-119

1.

2.

3.

4.

5.

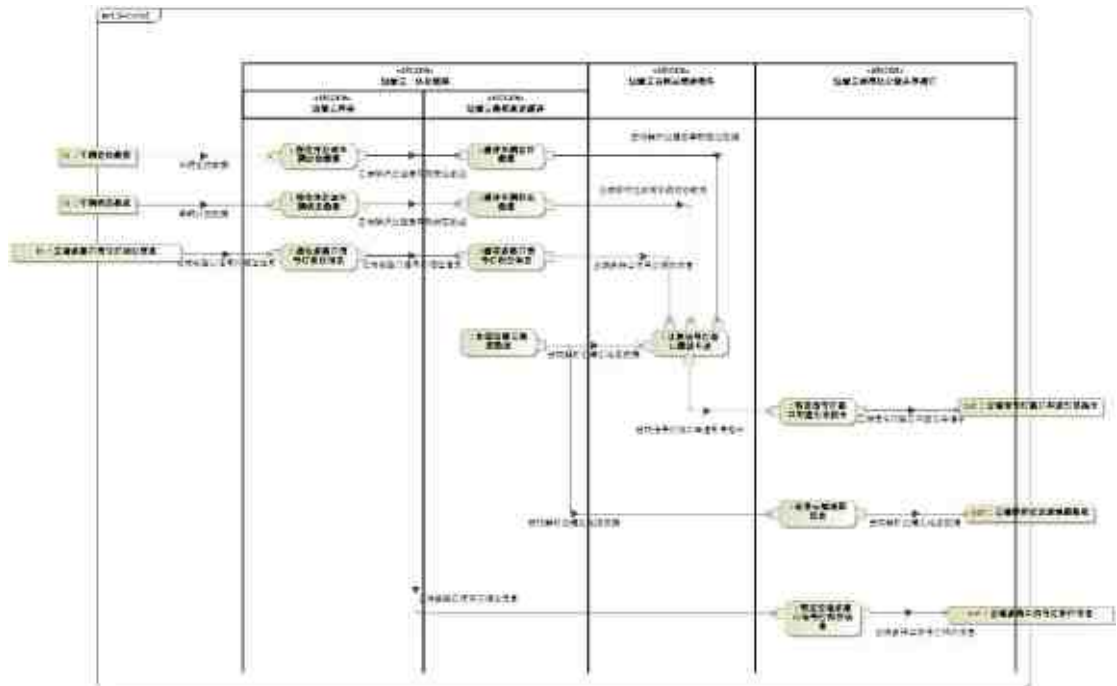
6.

3 “ ”

4-120

“ ”





4-120

-

“ ”

1.

2.

3.

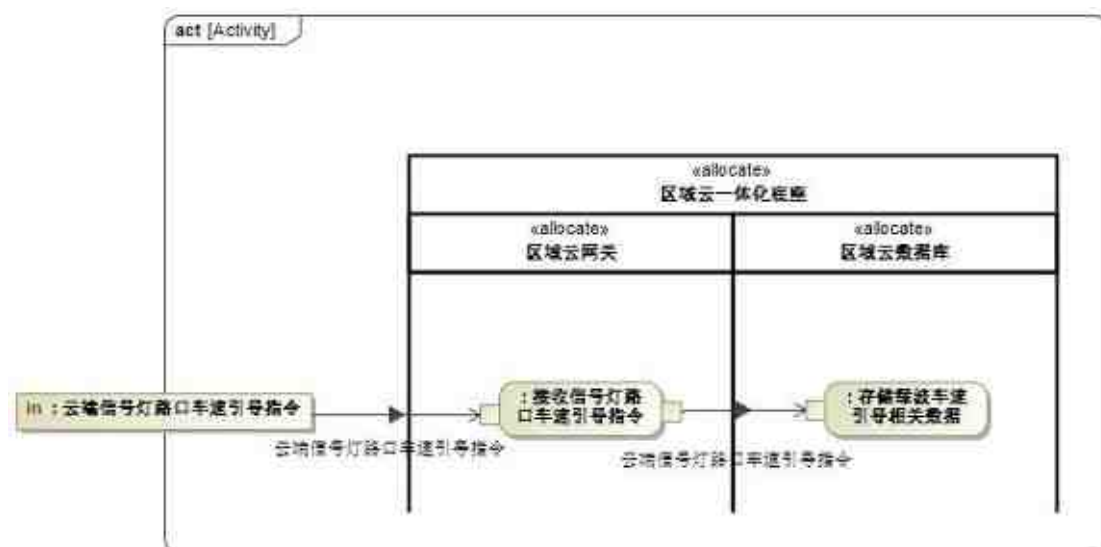
4.

4 “ ”

4-121

”

“



4-121

“ ”

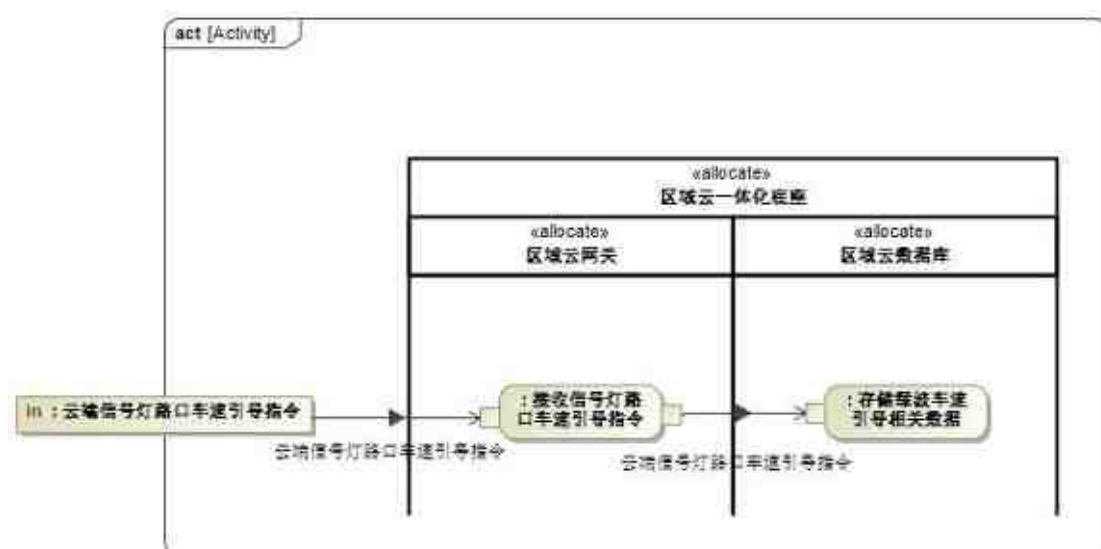
1.

2.

3.

5 “ ”

4-122 “ ”



4-122

“ ”

---

1.

2.

## 4.32

### 4.32.1

/

### 4.32.2

### 4.32.3

### 4.32.4

1

2

### 4.32.5

L3

HMI

L4

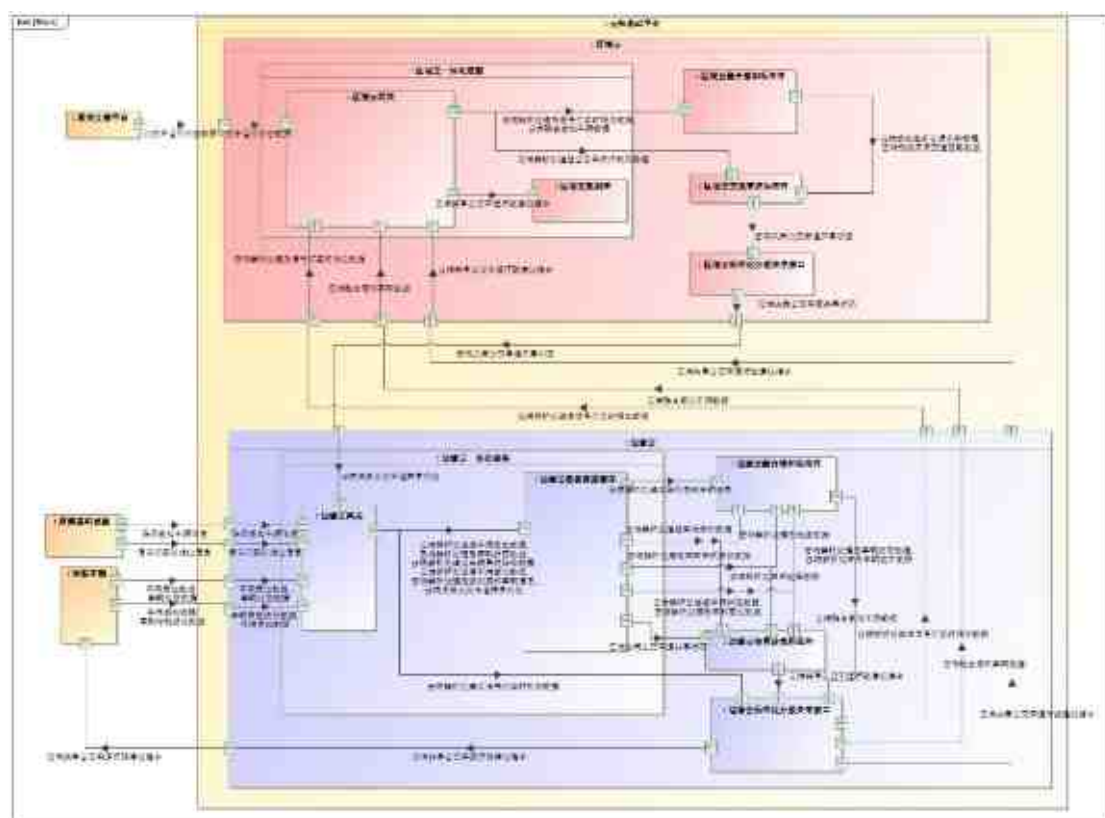
4.32.6

/

4.32.7

1

4-123

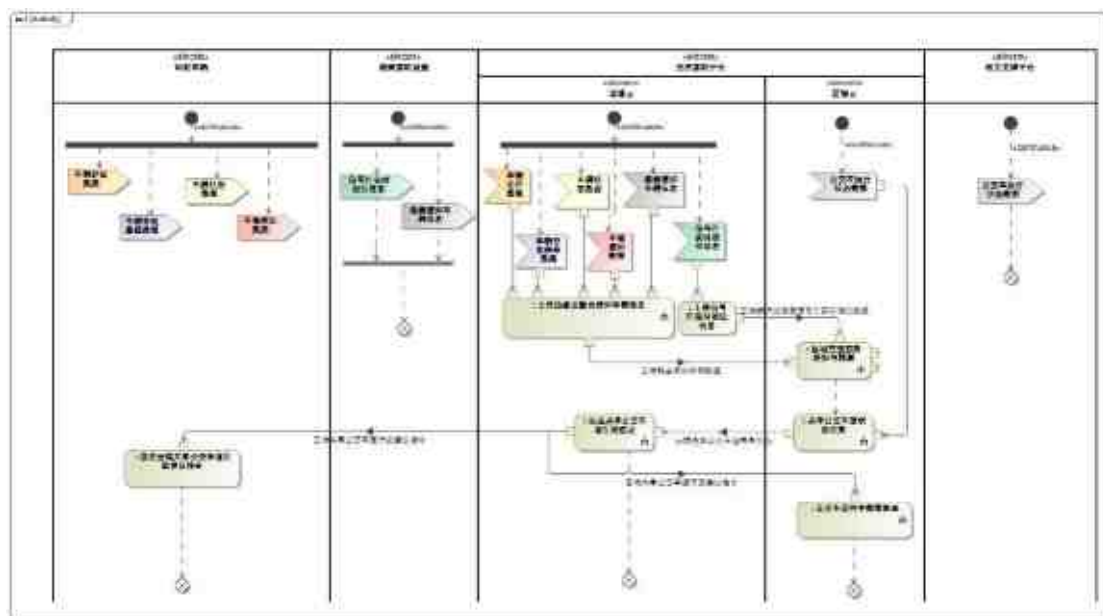


4-123

4-123

2

4-124



4-124

1.

2.

3.

4.

5.

6.

3

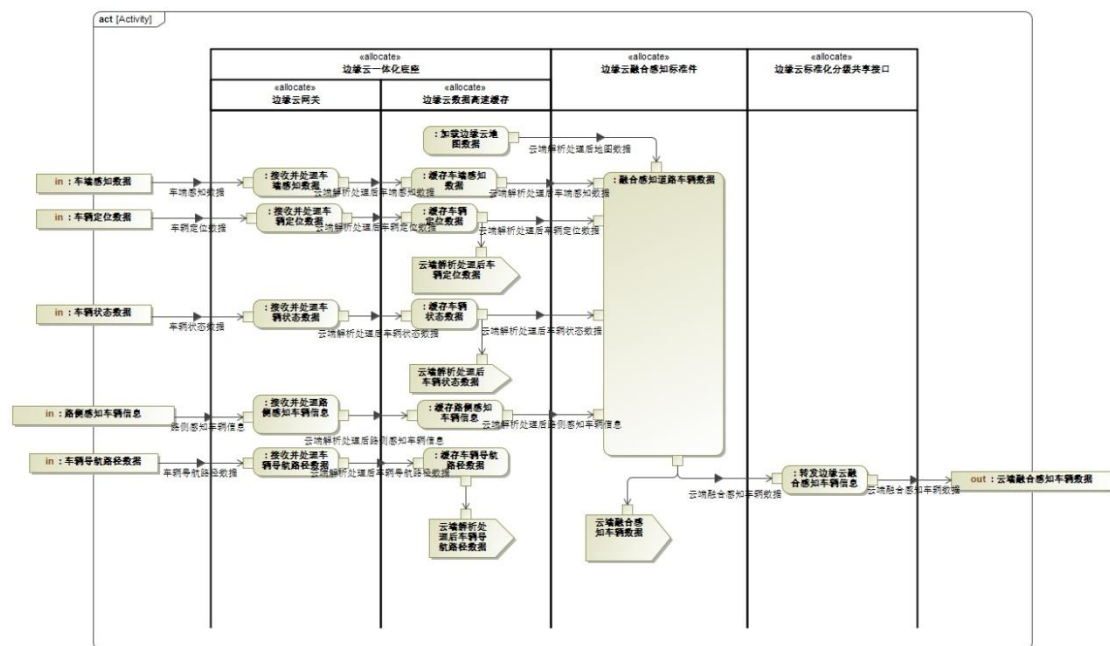
“

4-125

”

”

“



4-125

-

“

”

1.

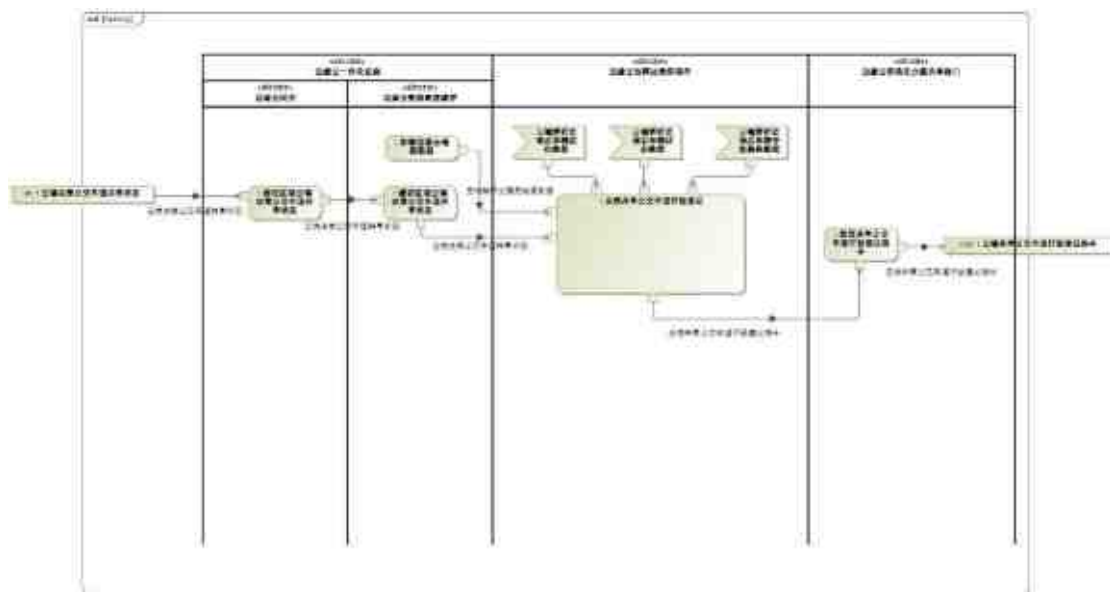
2.

3.

4 “

4-126

”



4-126

“

”

1.

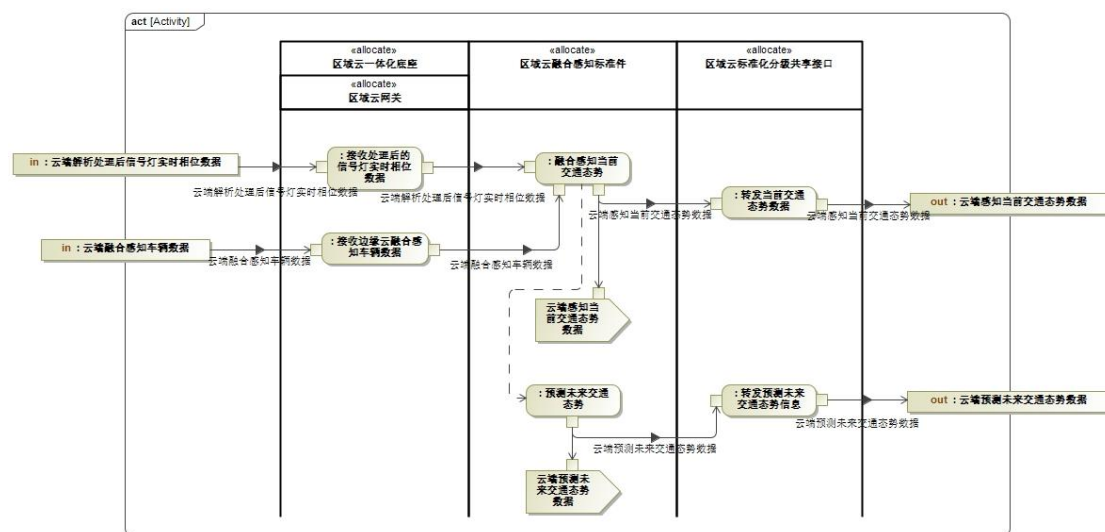
2.

3.

5 “

4-127

”



4-127

“ ”

1.

2.

3.

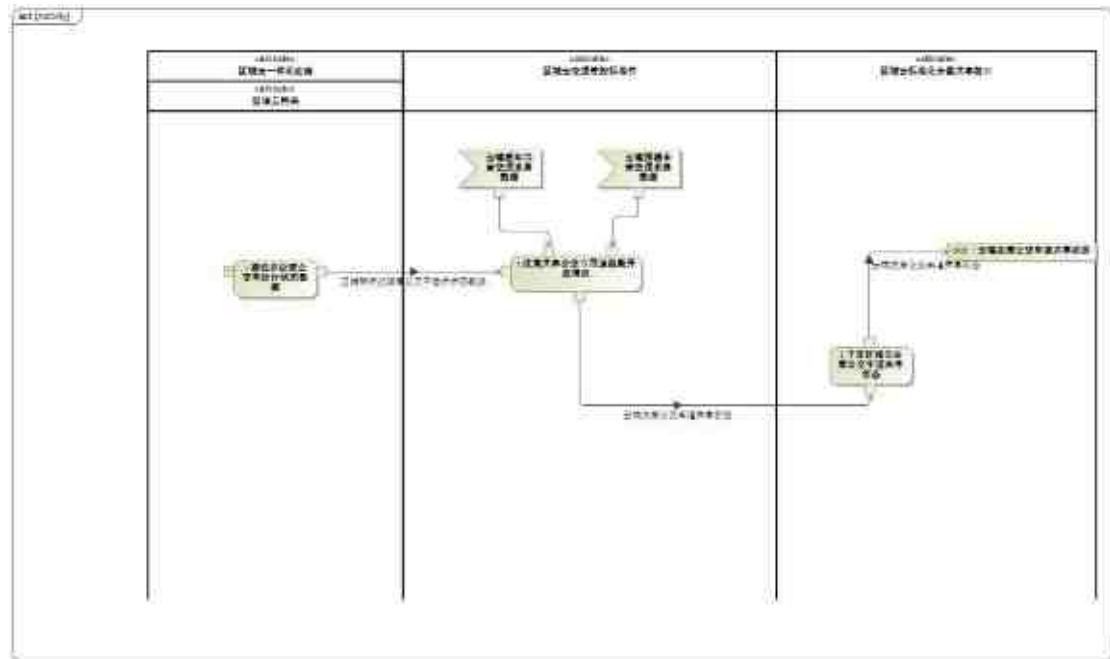
6 “ ”

4-128

“

”



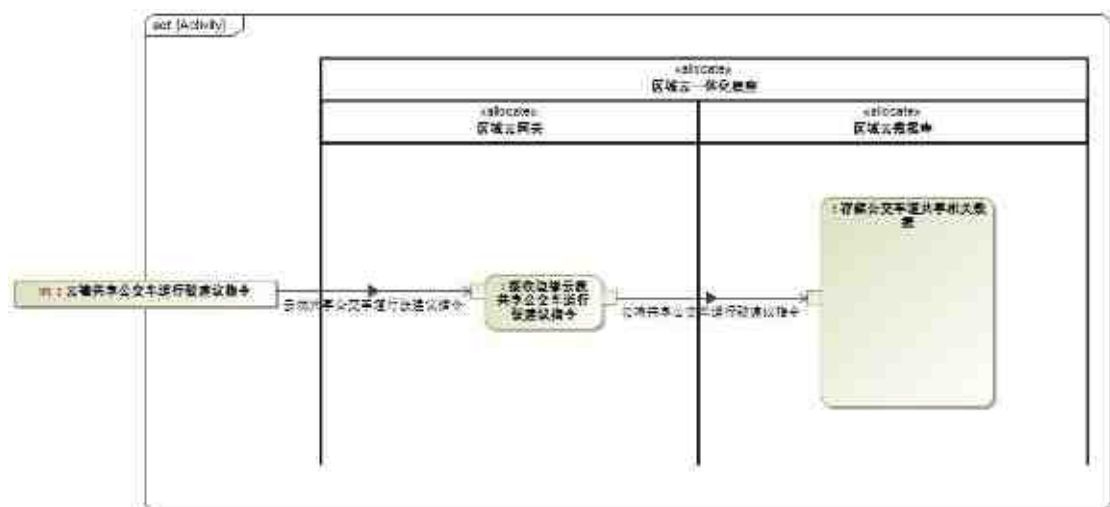


4-128

- “ ”
- 1.
  - 2.
  - 3.
  - 7 “ ”

4-129

“ ”



4-129

- 
- “ ”
- 1.
  - 2.

---

5

1.0

“

”

7S

1.0

“

”

“

”

1.0

15

15

“

”

1.0

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6

6.1      A

A.1

3.1

A.2

3.1.1

;A.3

3.1.2

;A.4

3.1.3

A.5

3.1.4

A.6

3.1.5

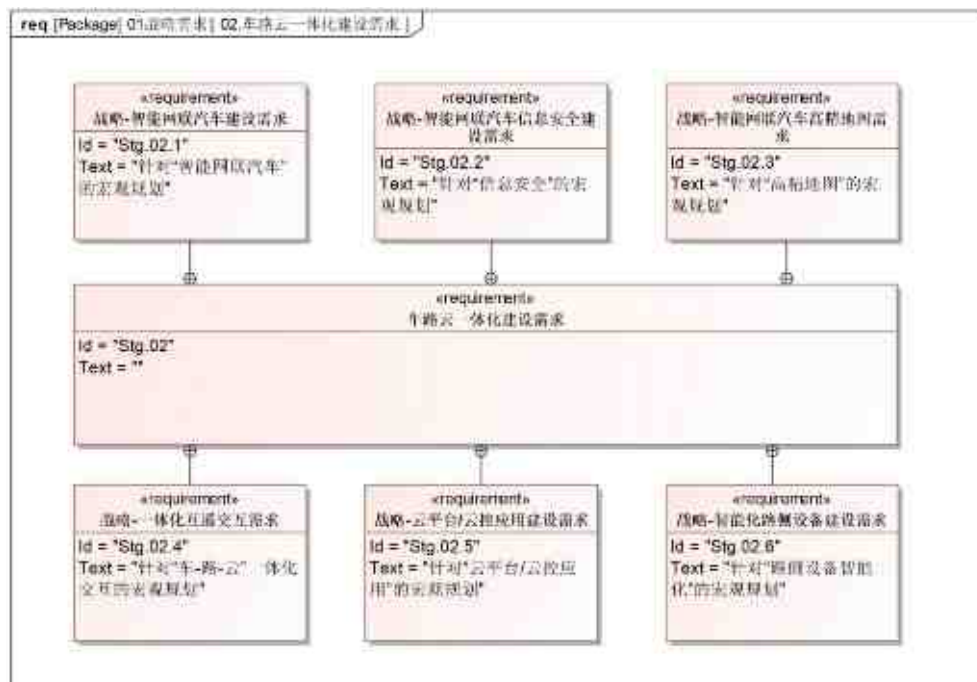
A.7

3.1.6

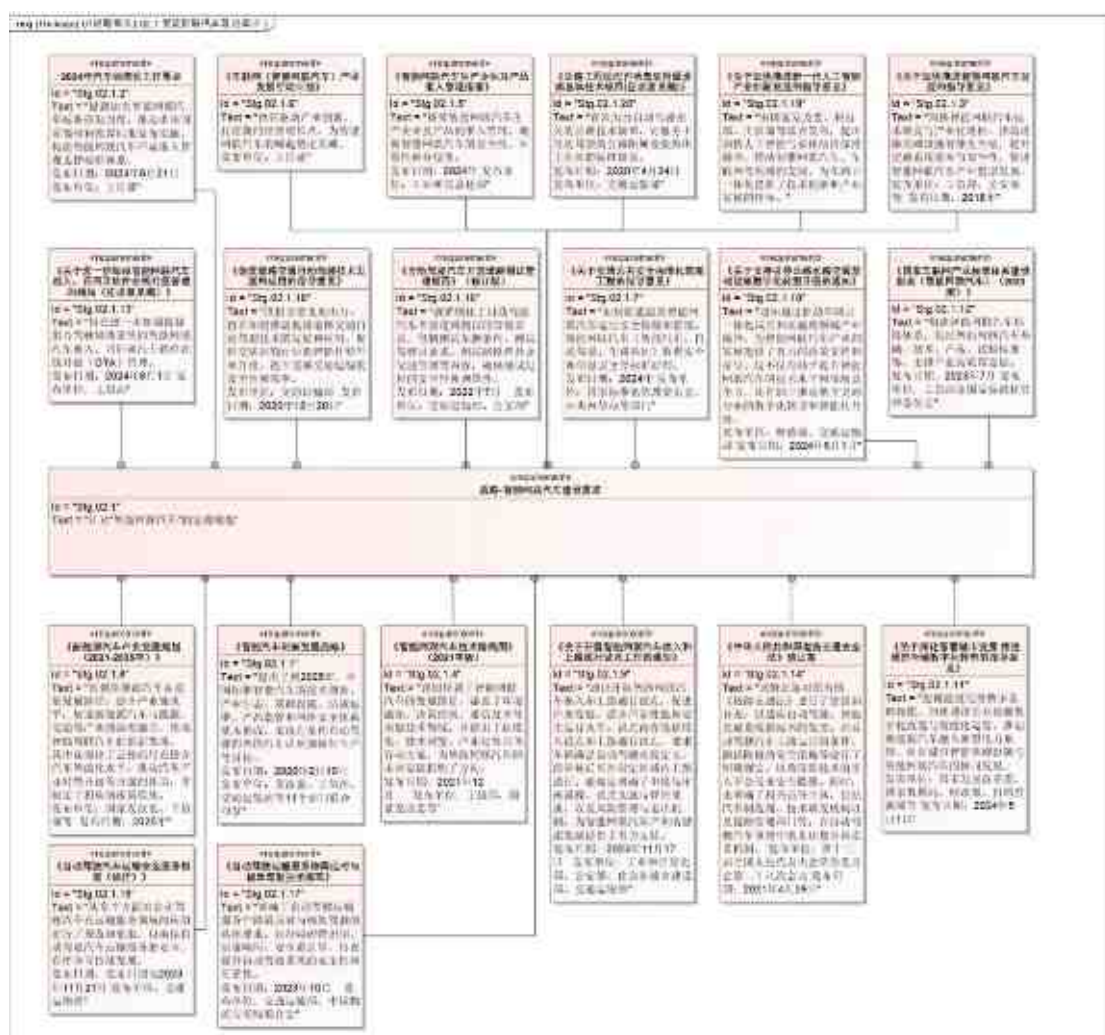
A.8

3.1.7

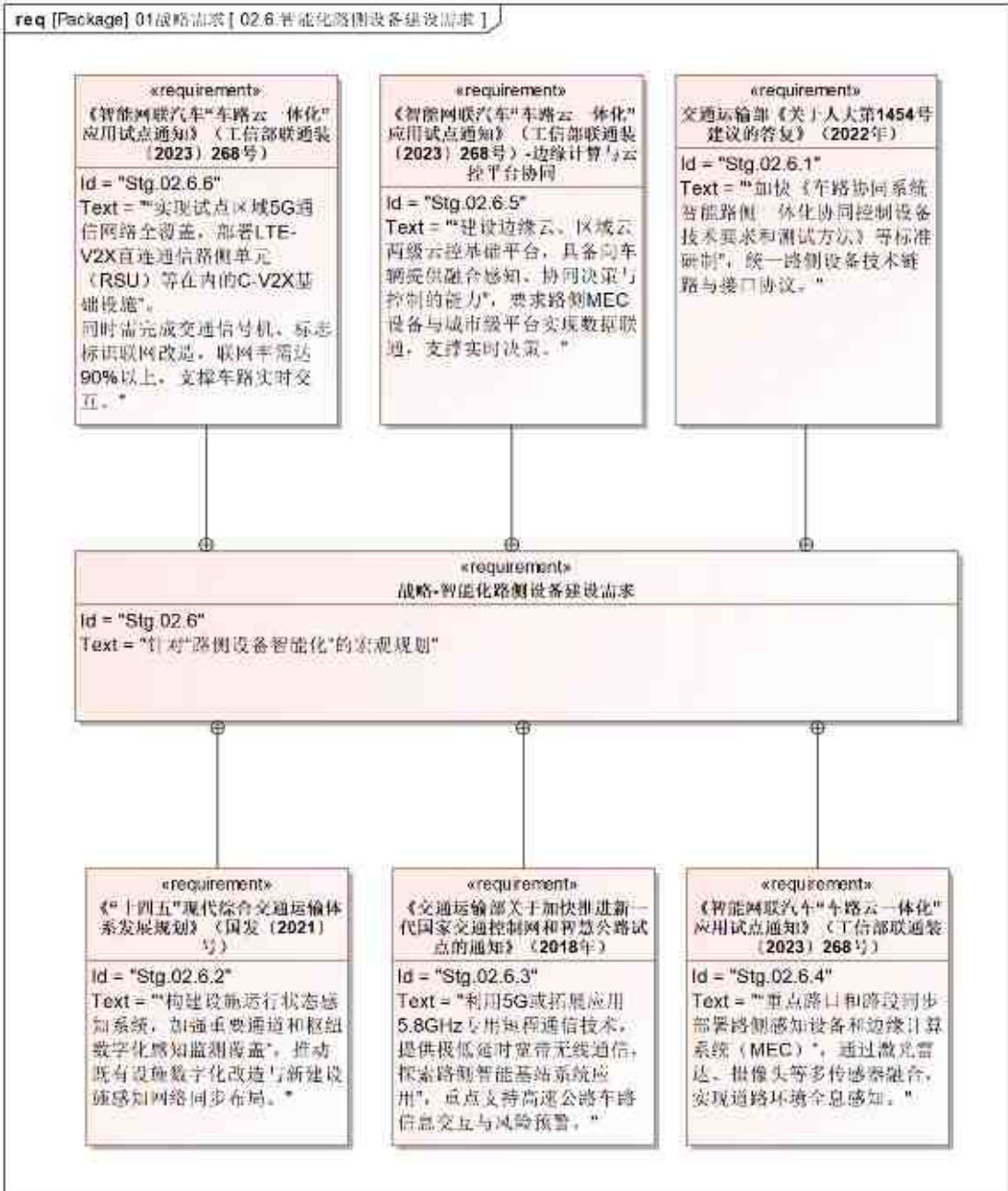
### A.2.1



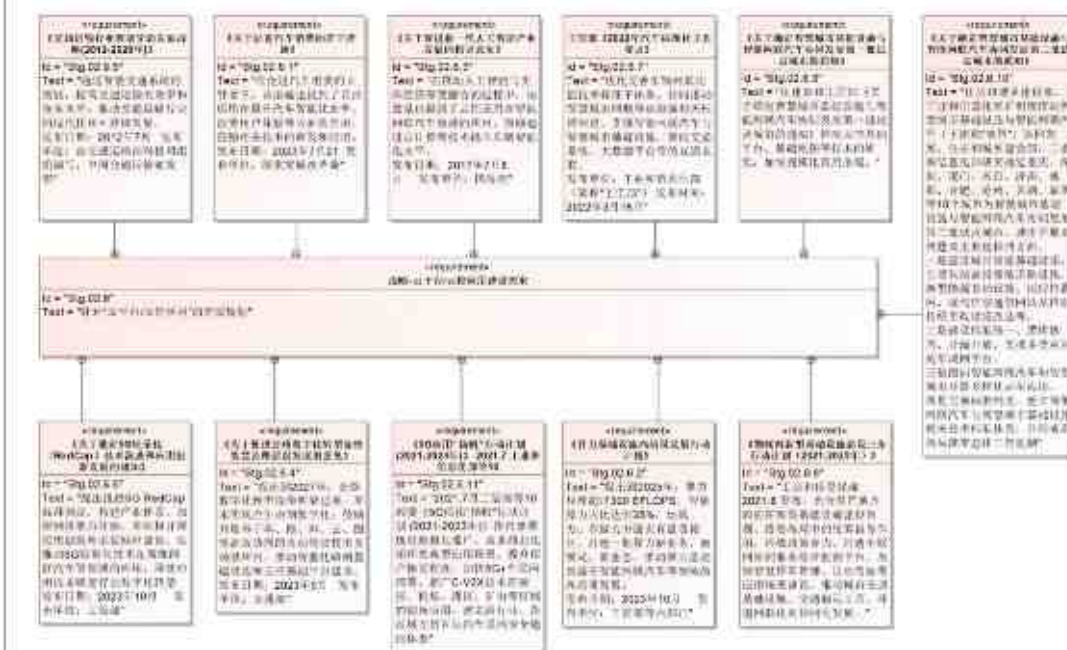
### A.2.2. -



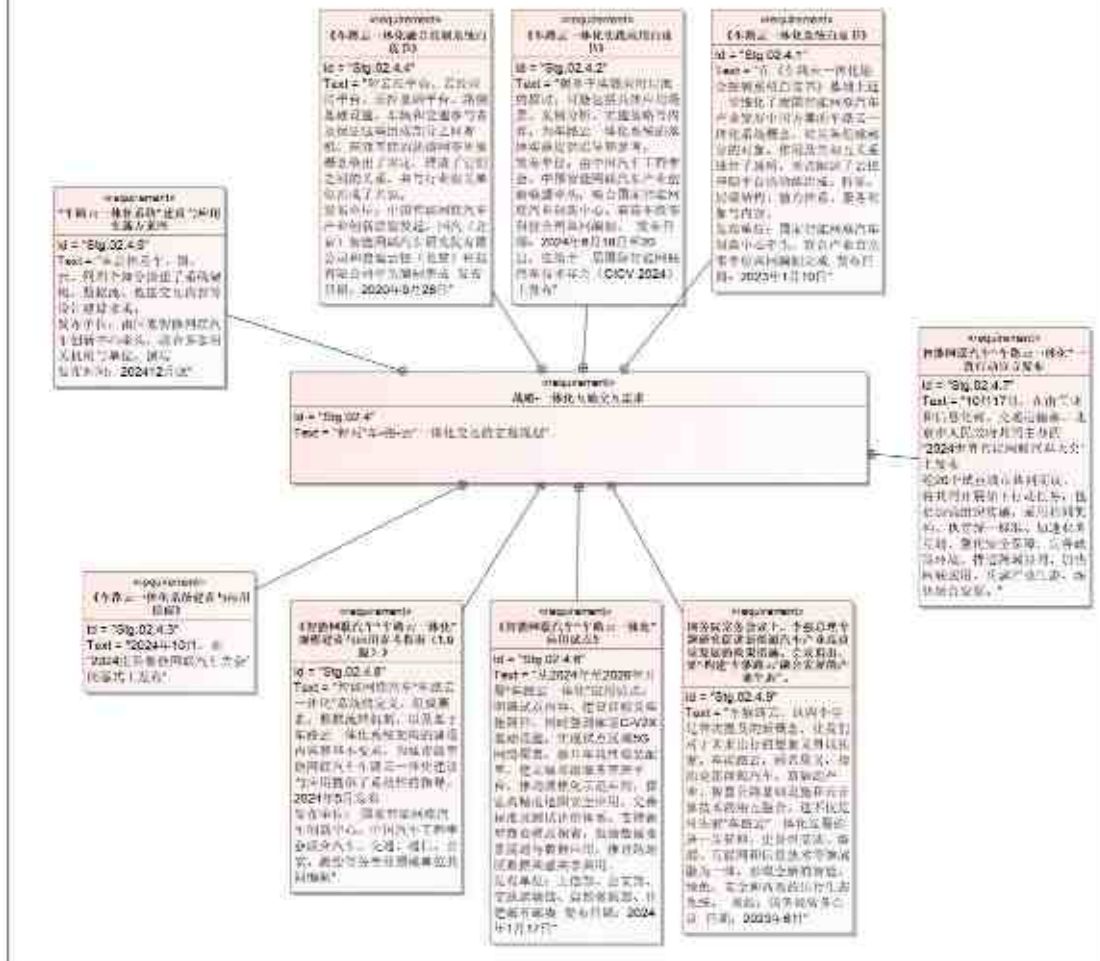
### A.2.3



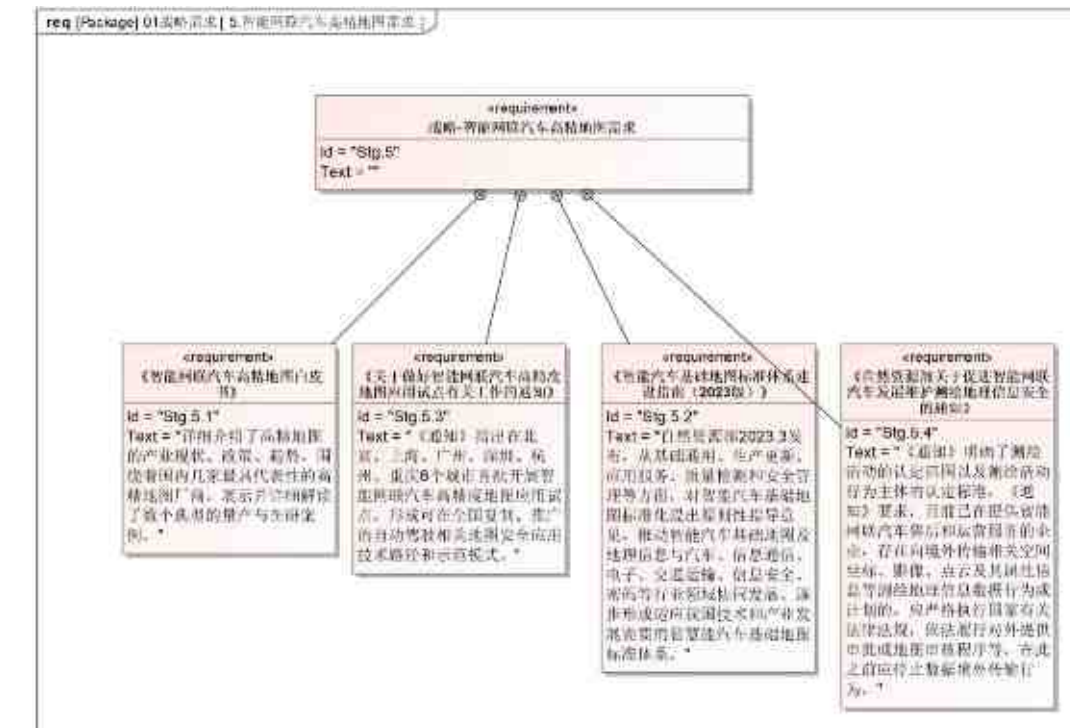
A.2. 4



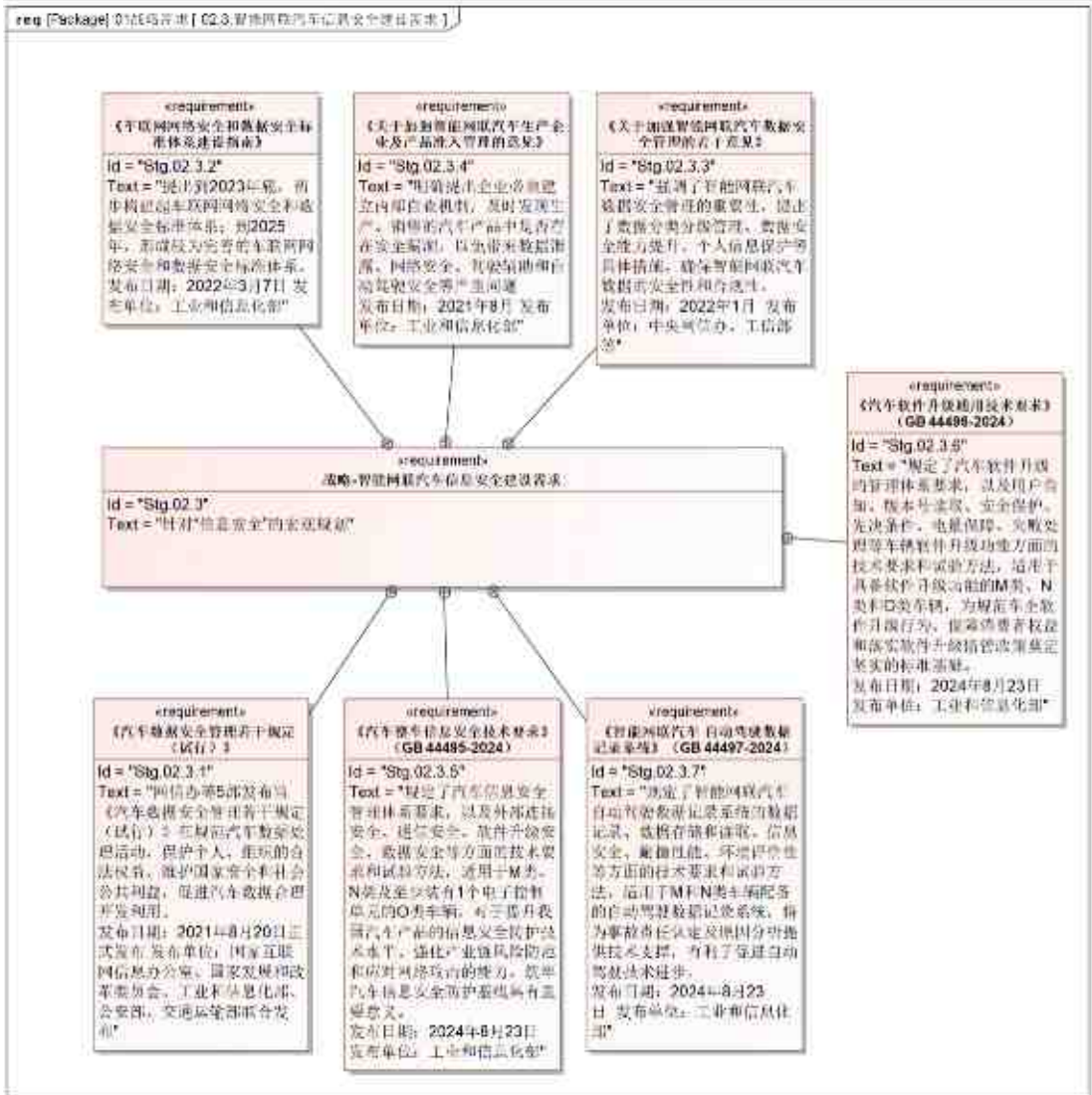




A.2.6

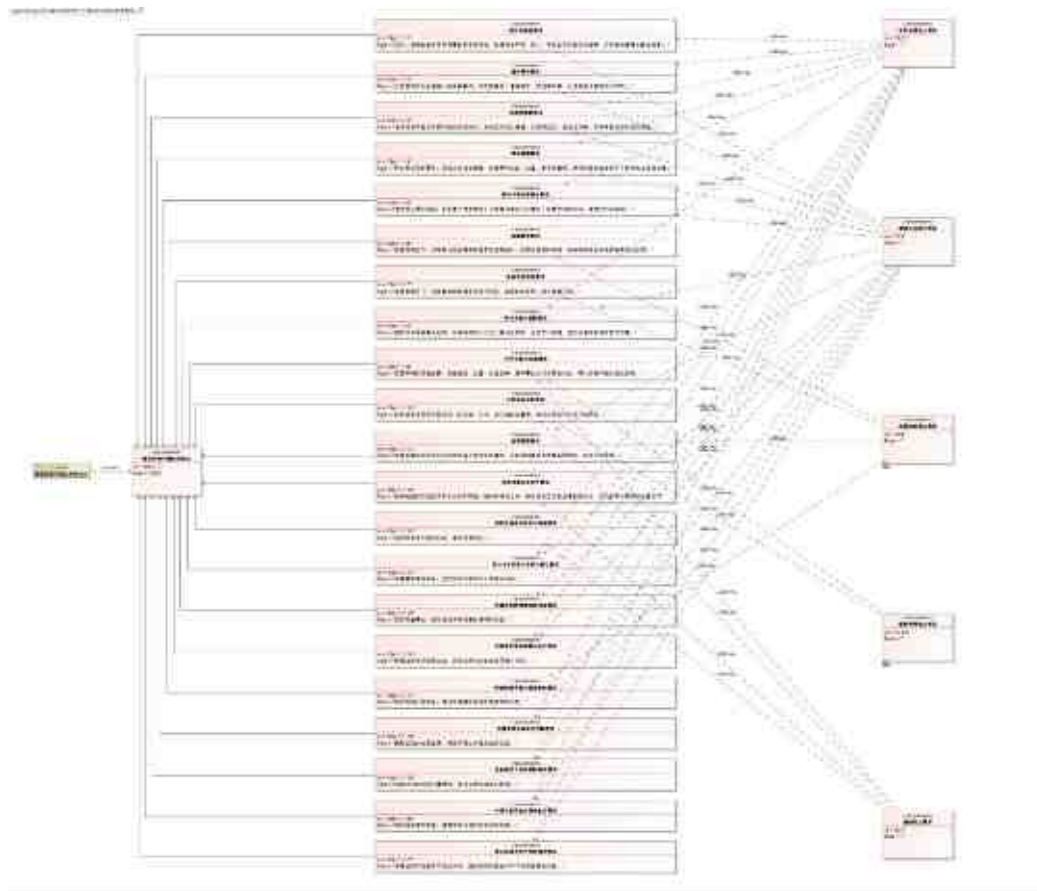


A.2.7

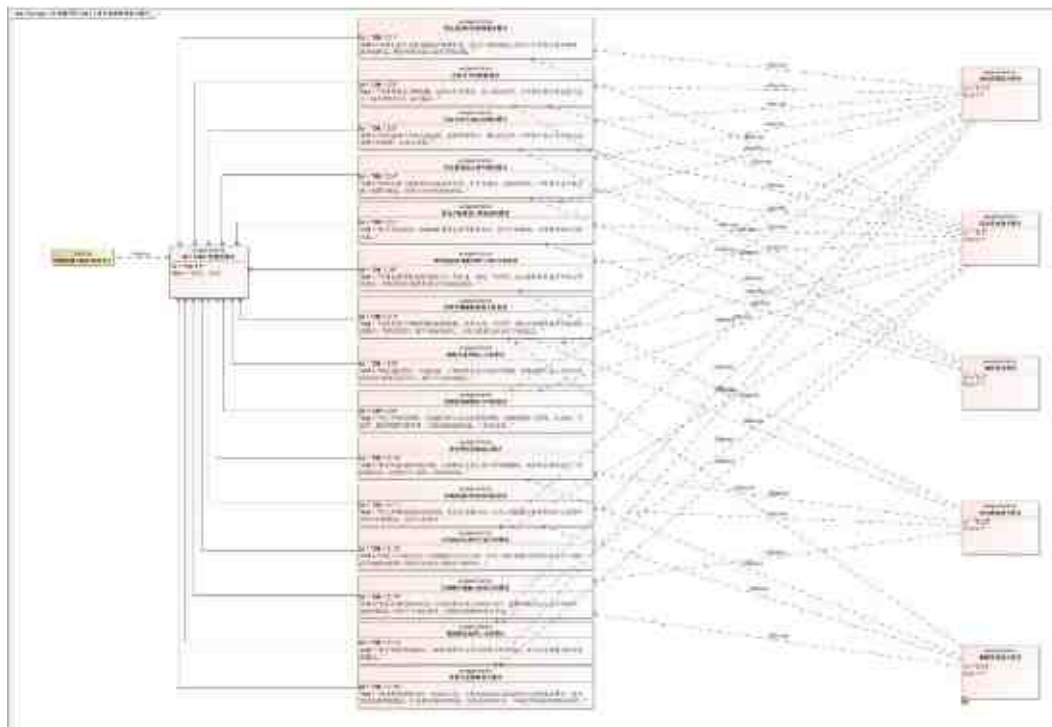


A.2. 8

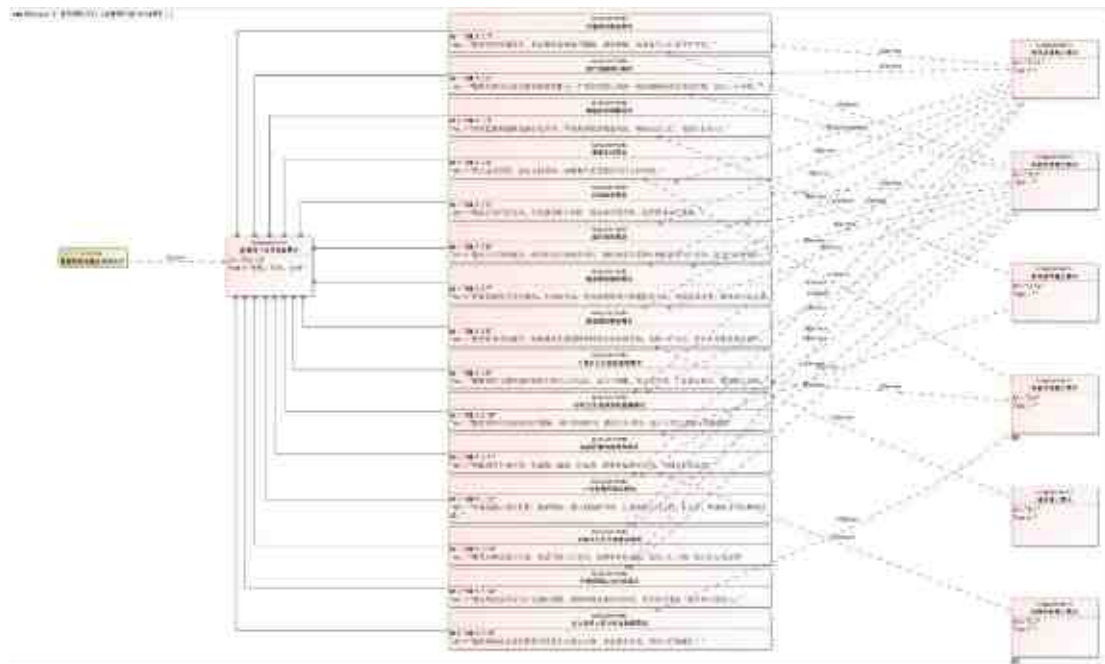
## A.3



A.3. 1. 1

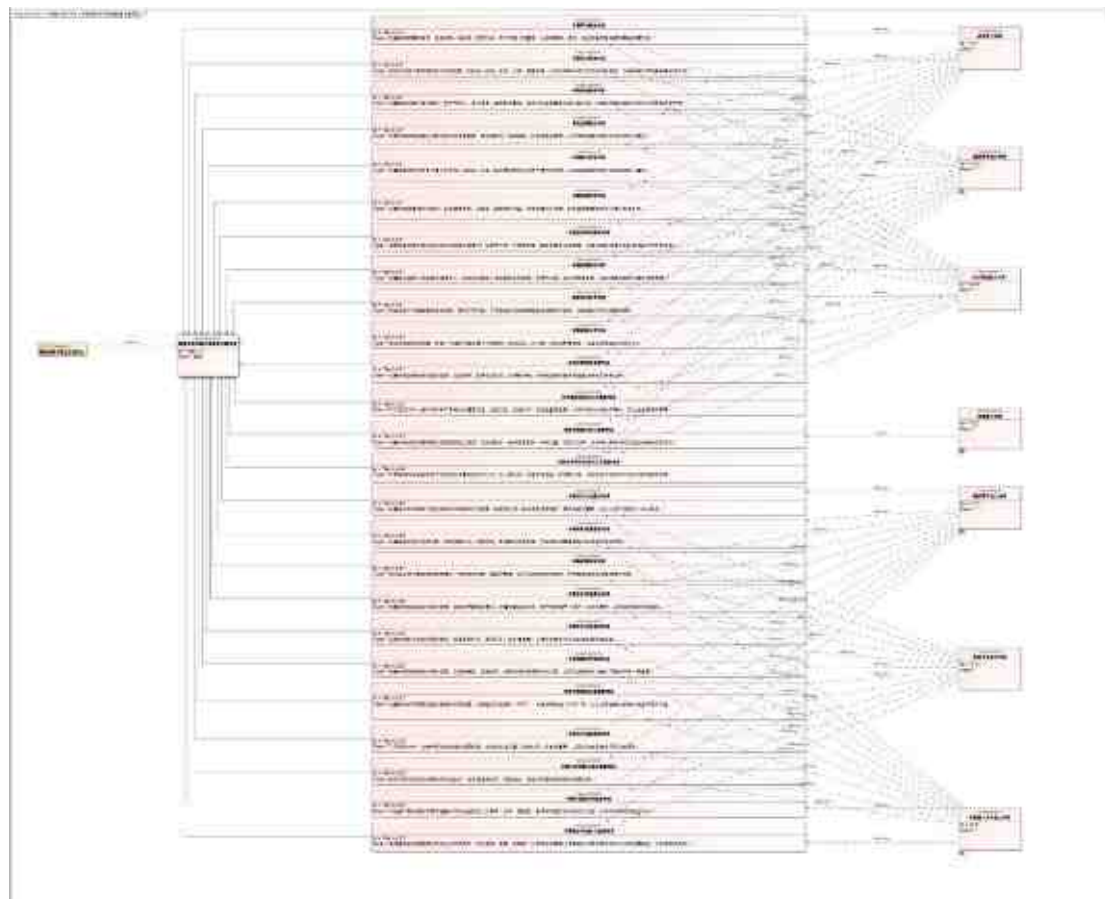


A.3. 1. 2



A.3.1.3

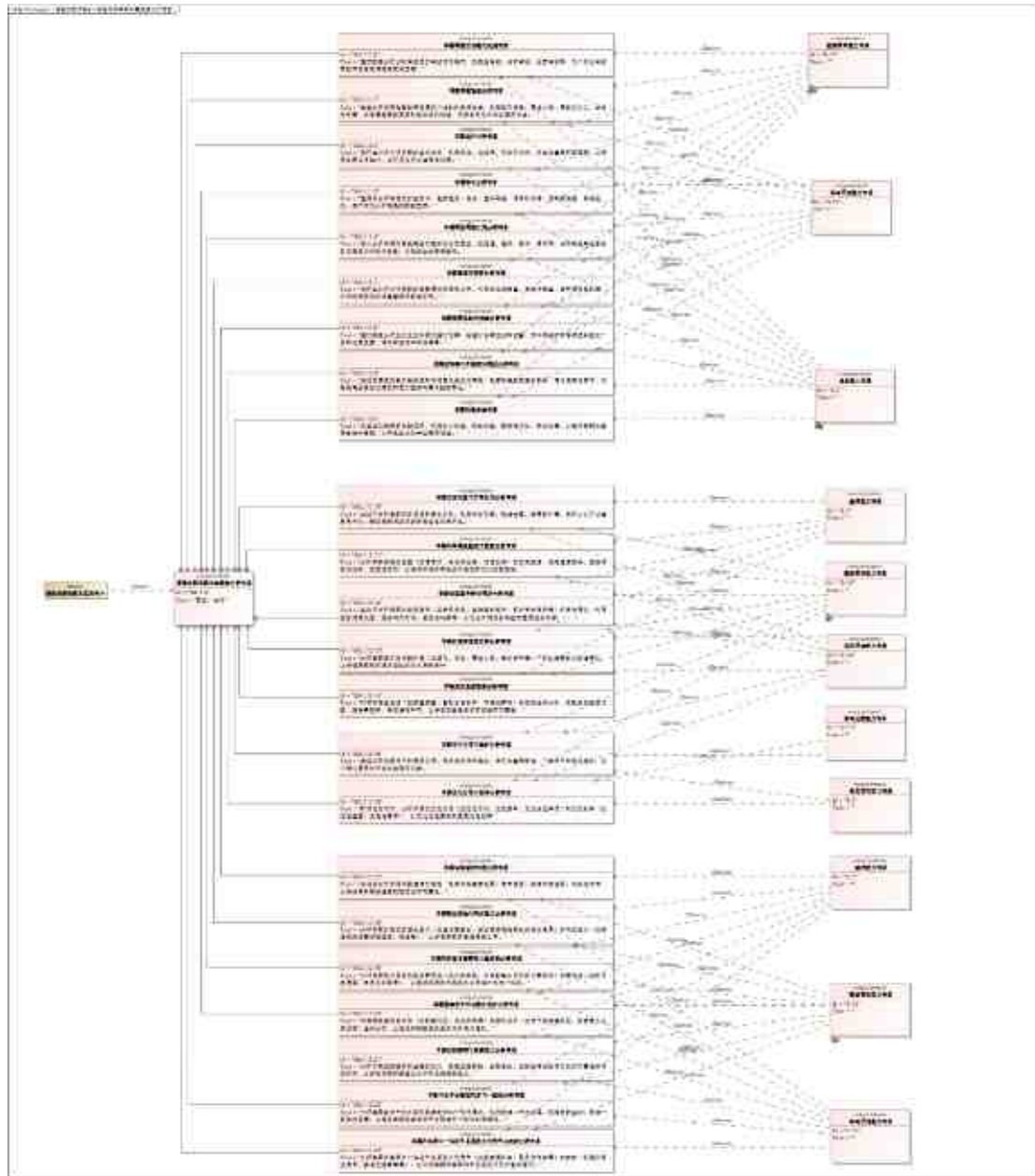
-



A.3.1.4

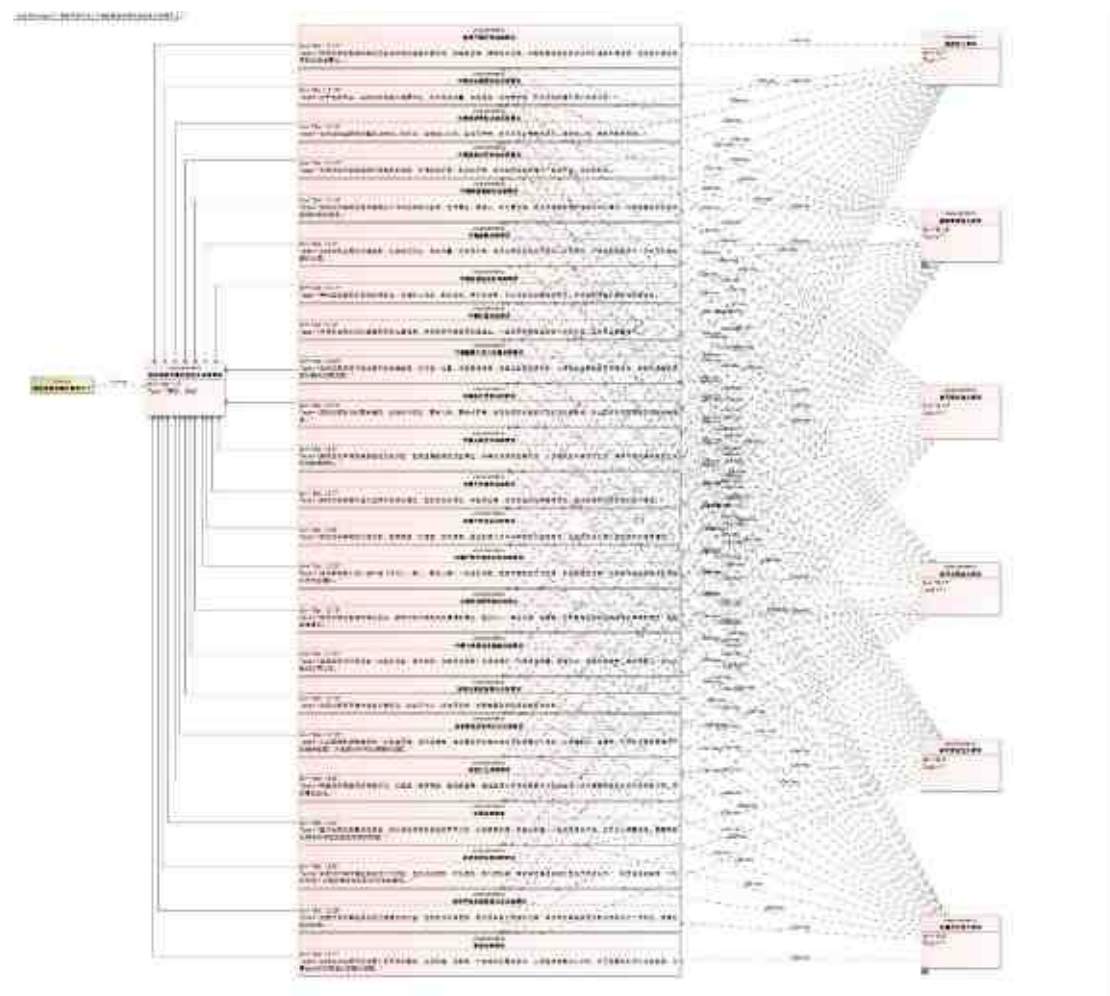
-





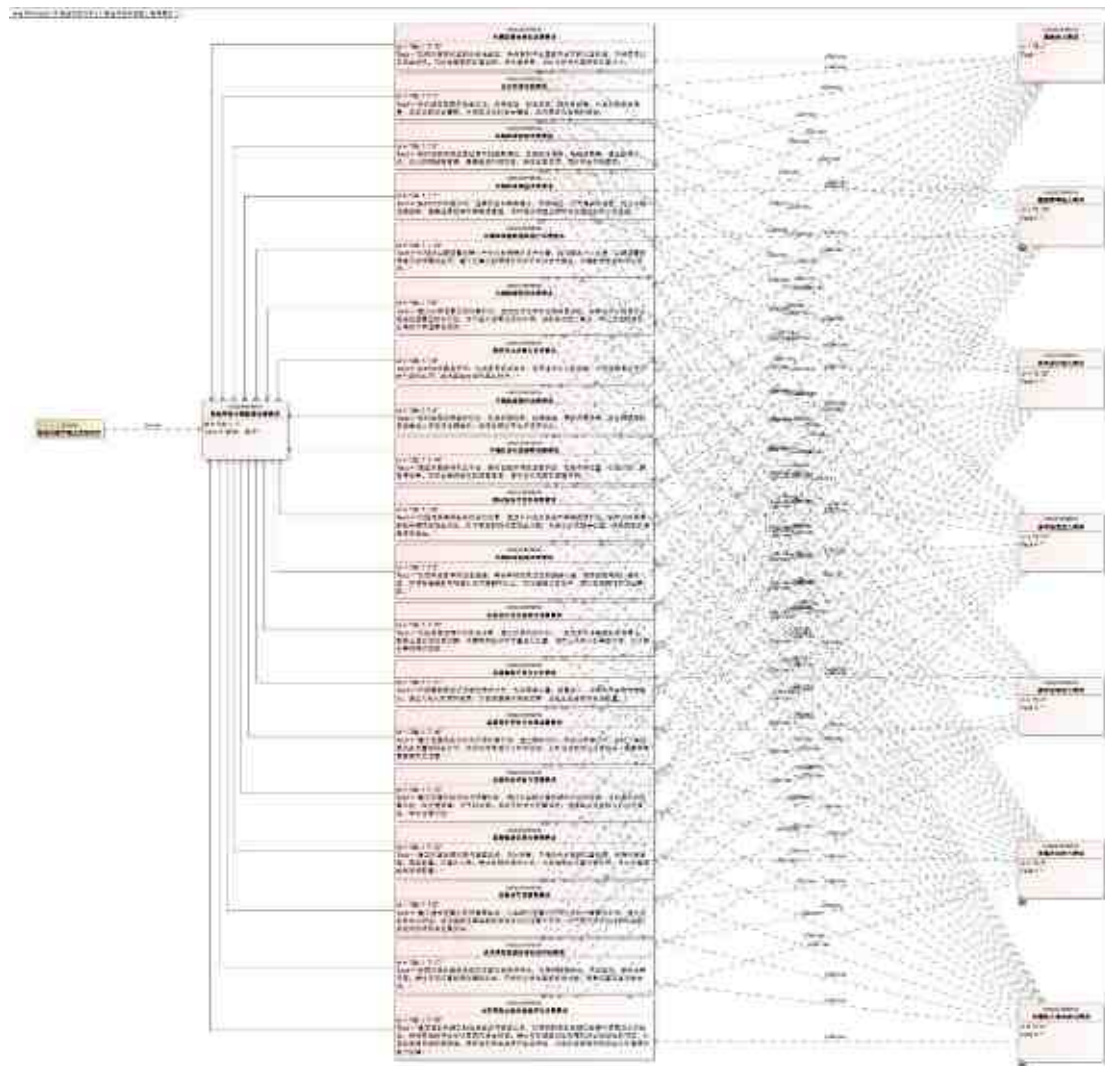
A.3.1.5

-



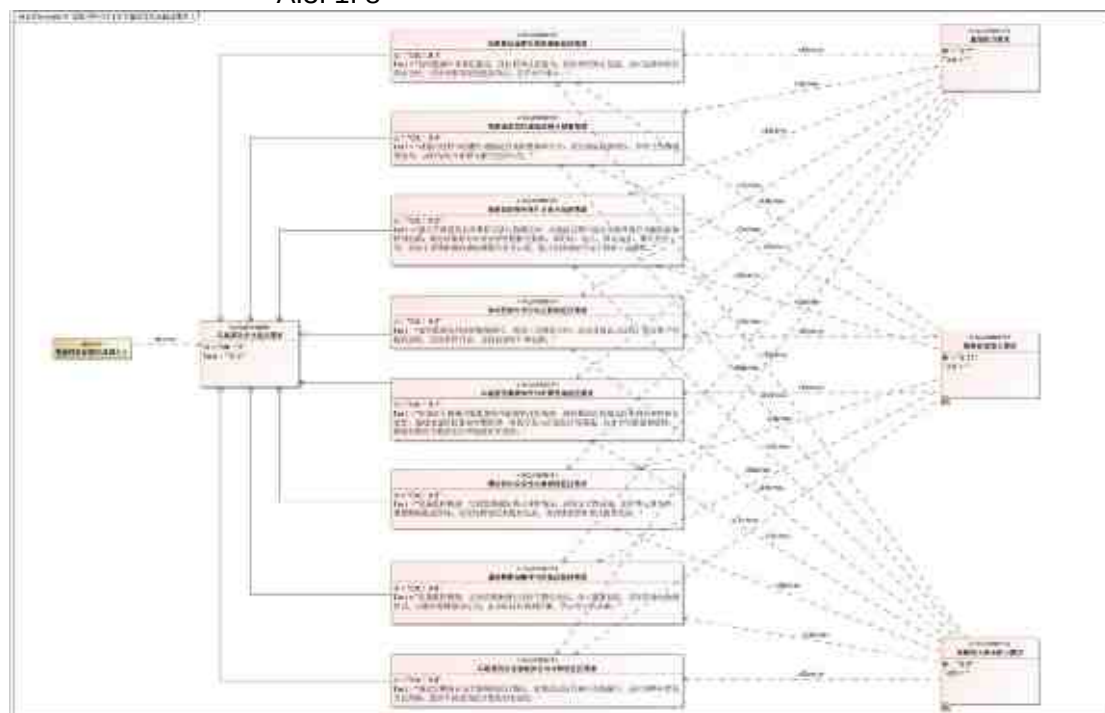
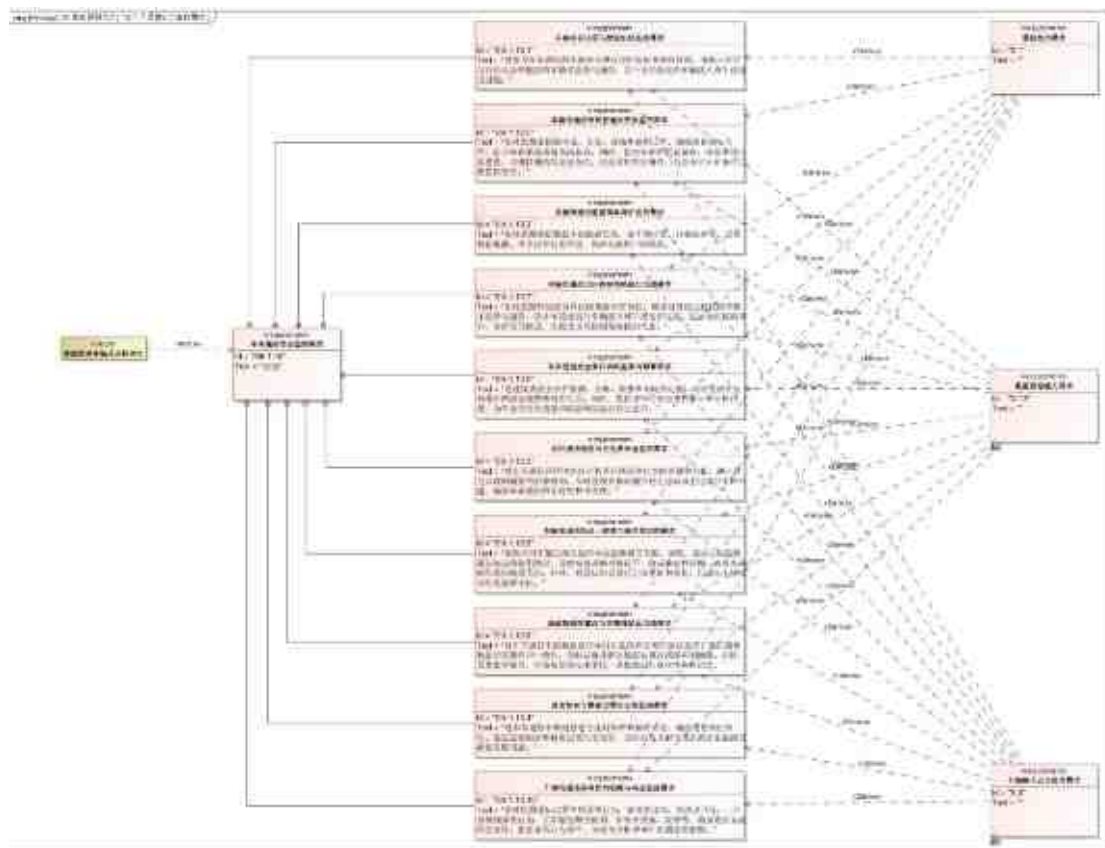
A.3. 1. 6

-

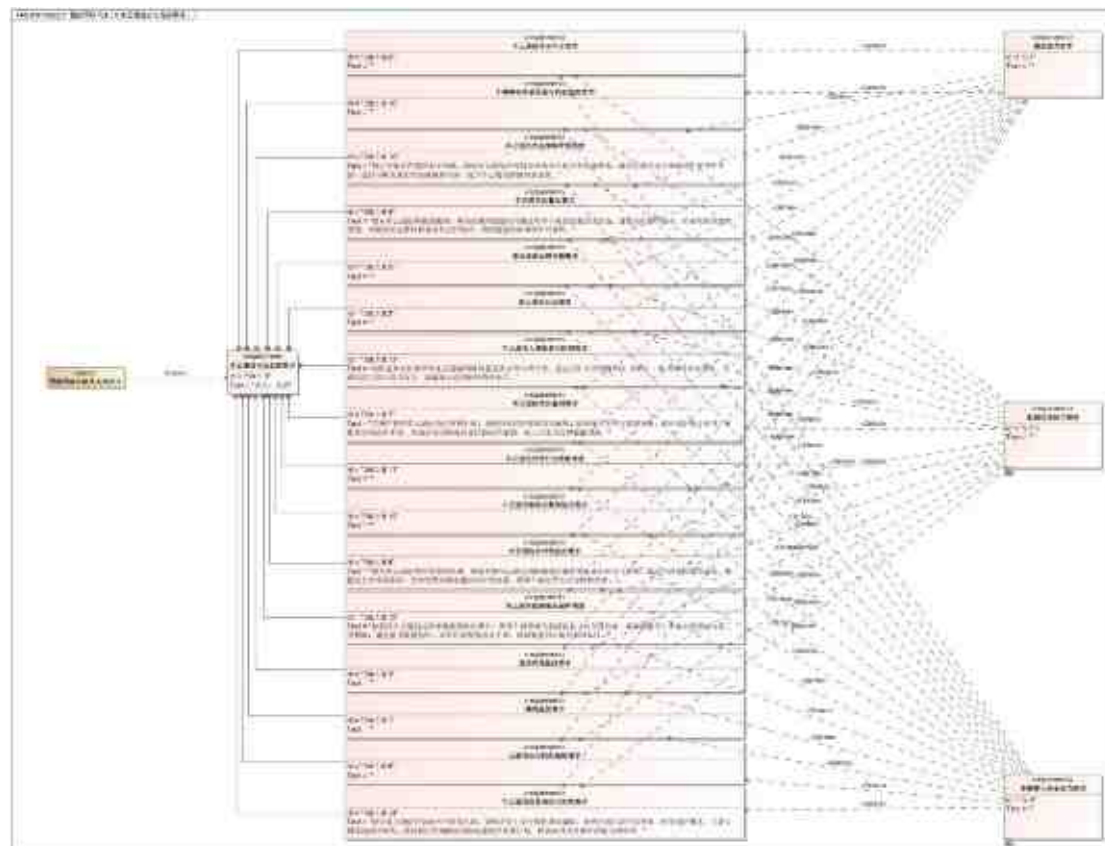


A.3.1.7

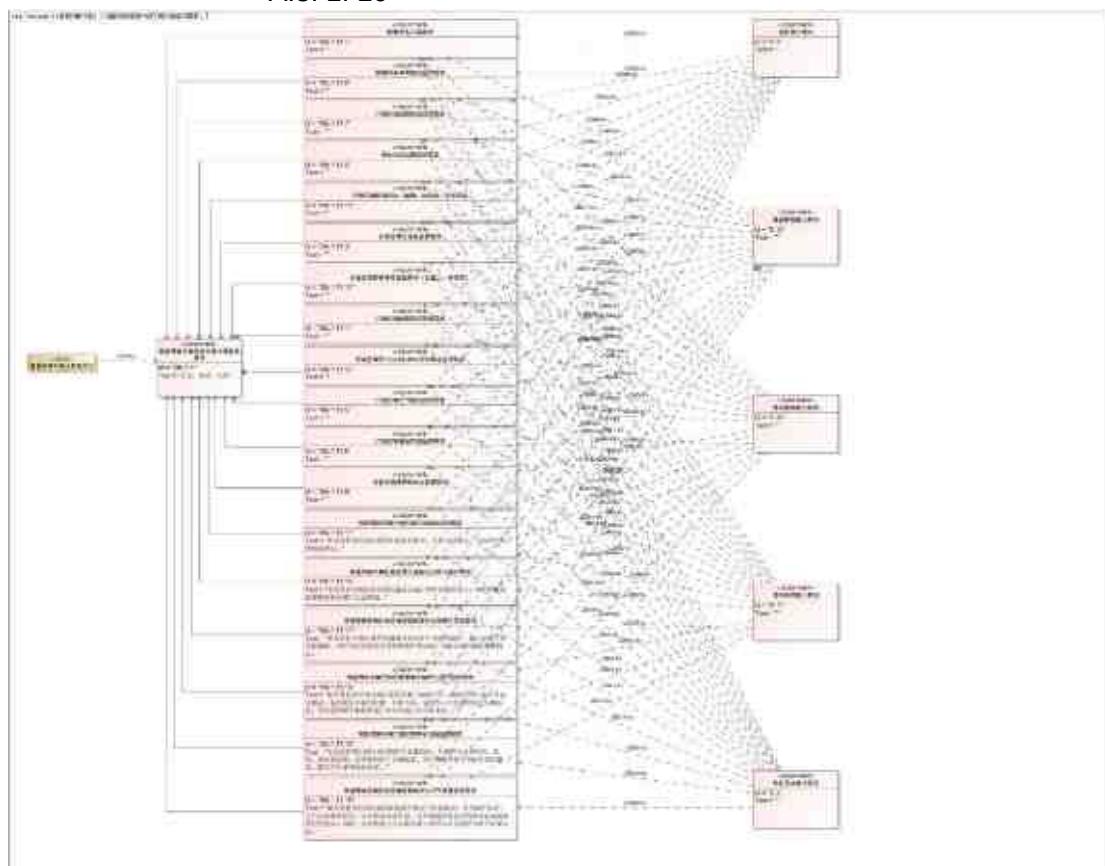
-



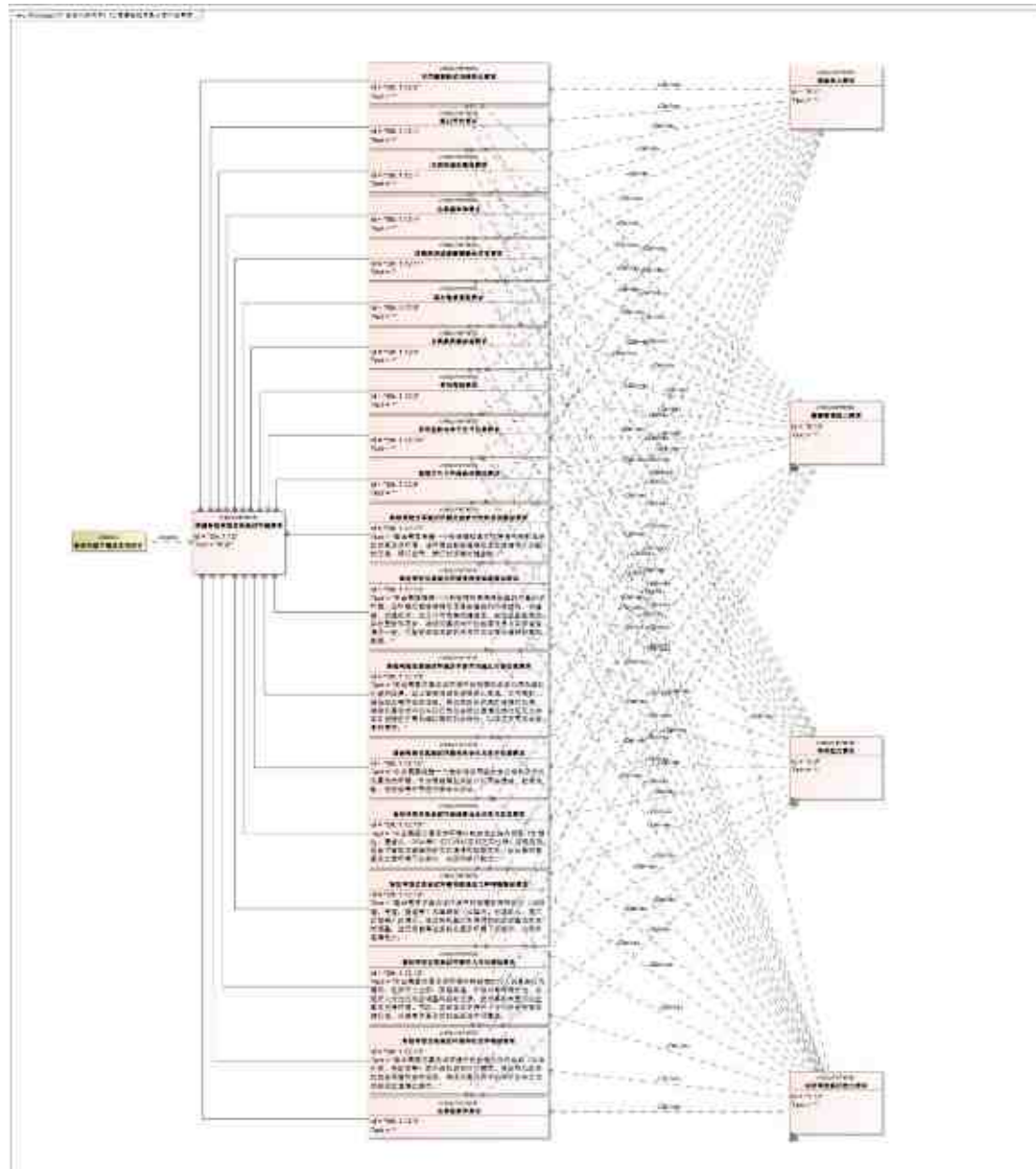




A.3.1.10



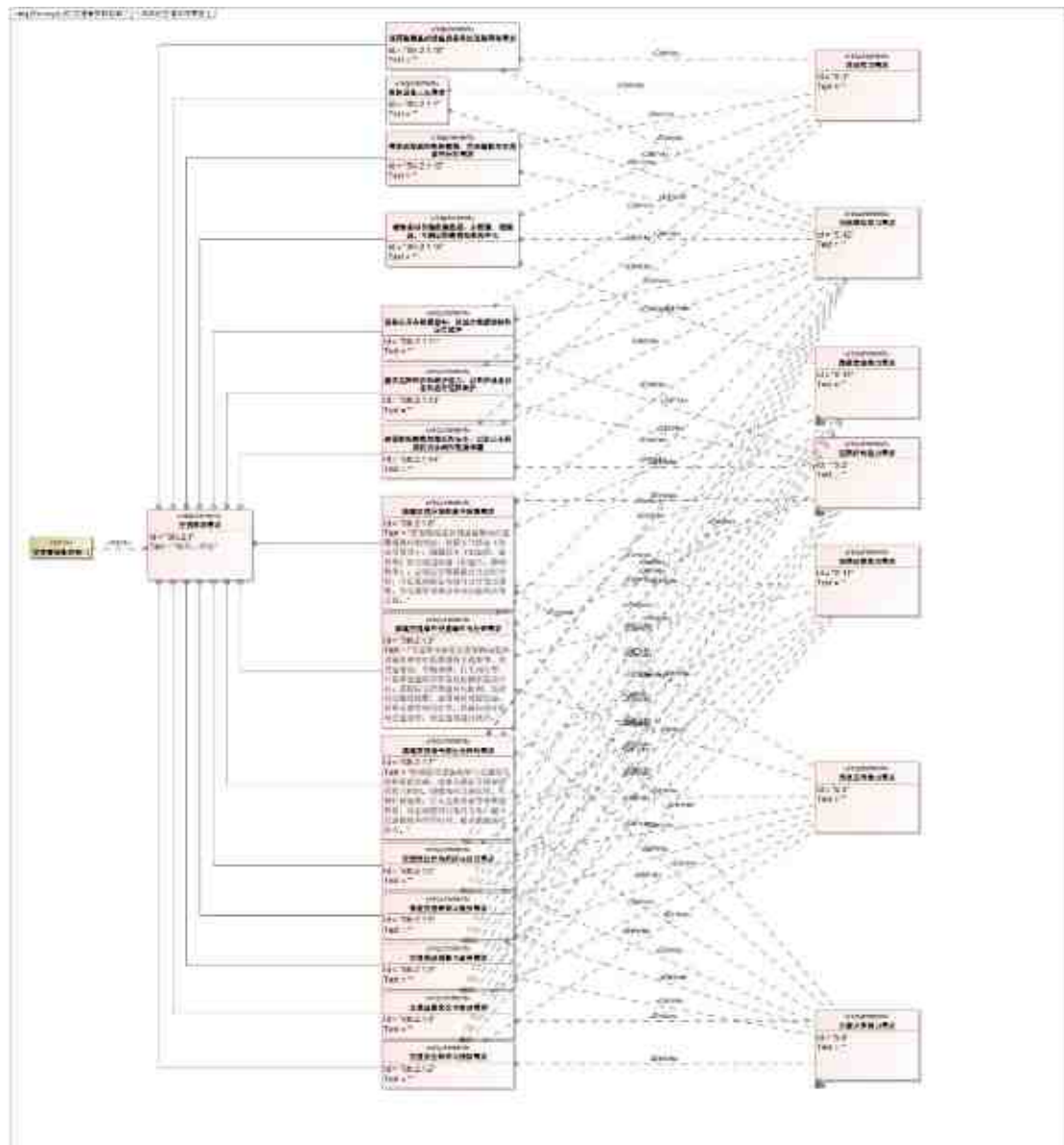
A.3.1.11



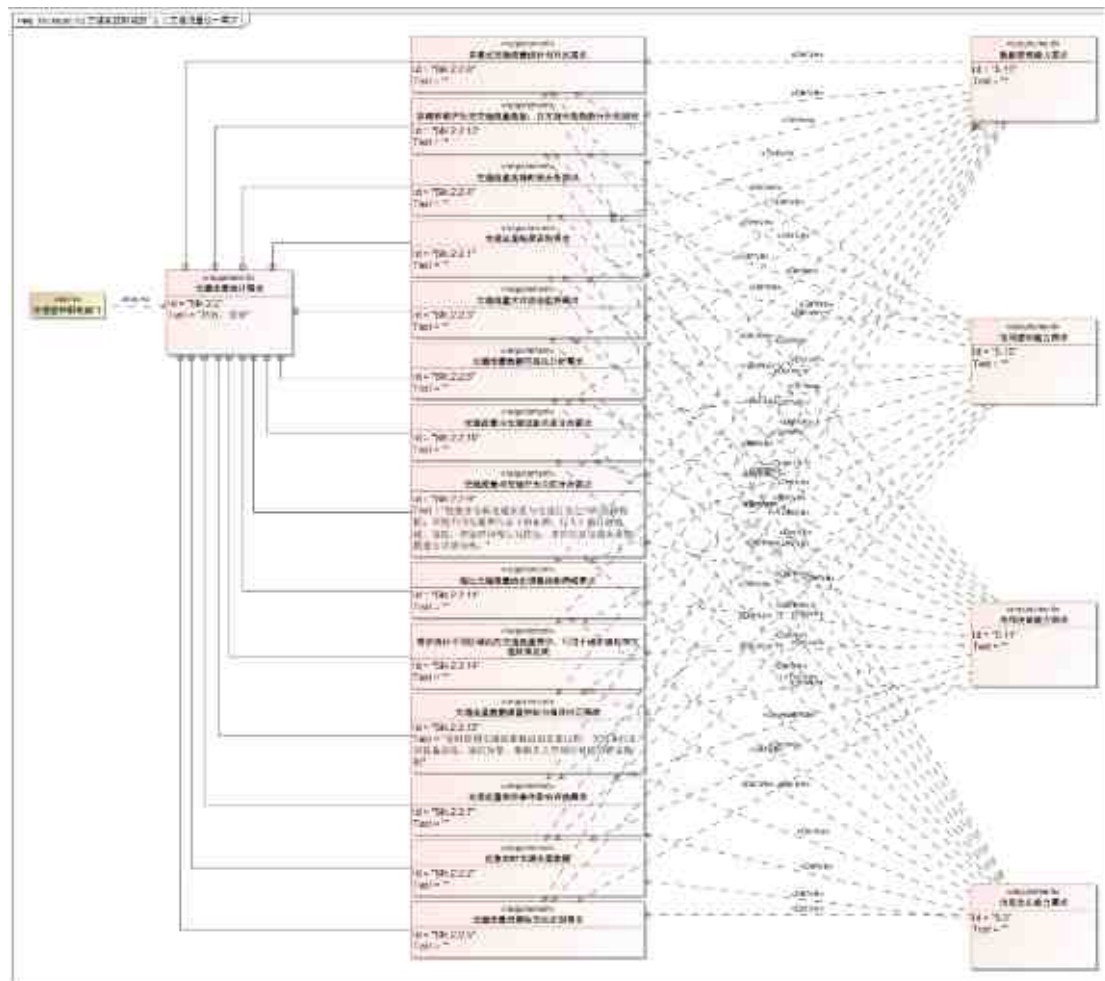
A.3.1.12







A.3.2.1



A.3. 2. 2

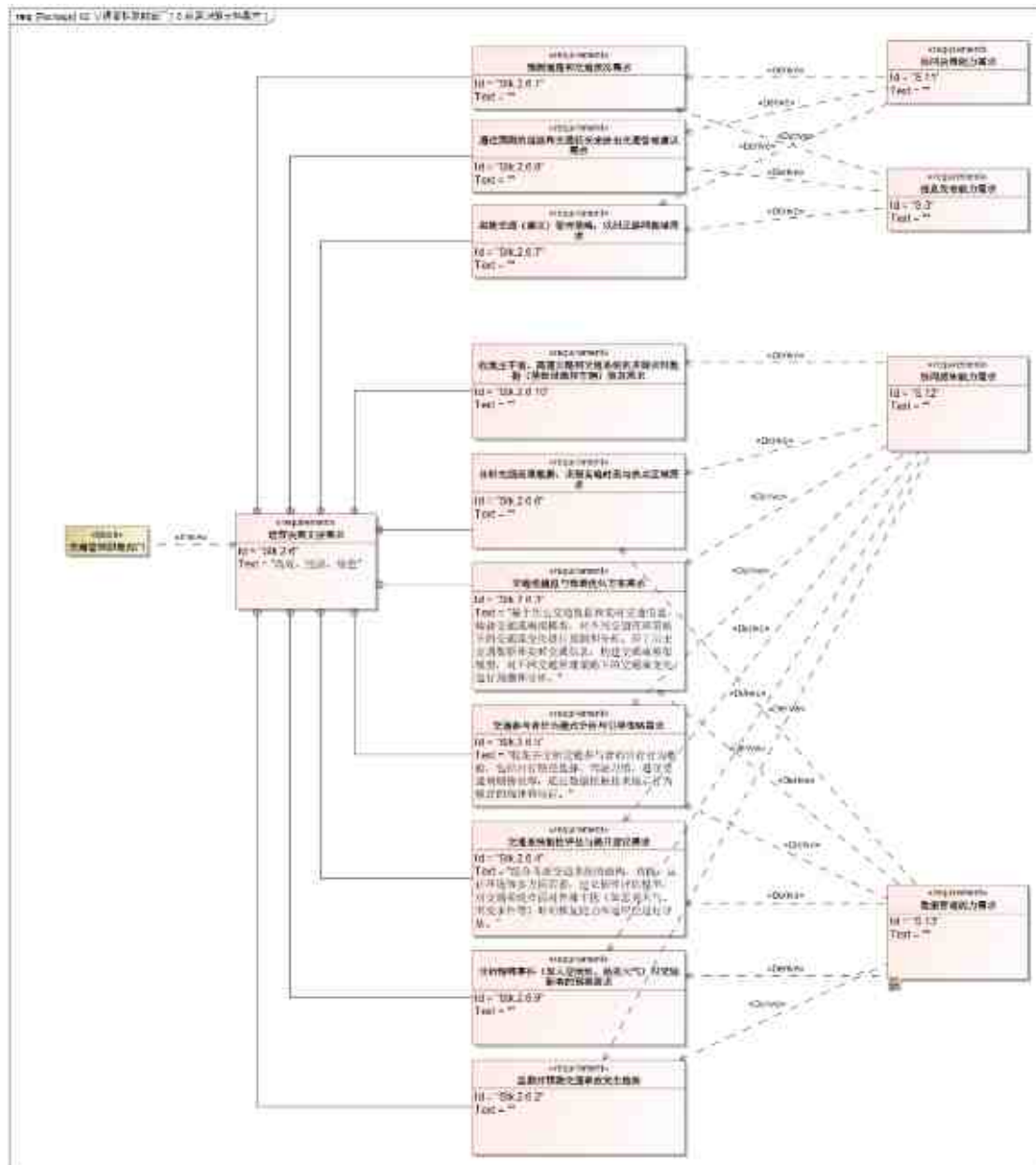






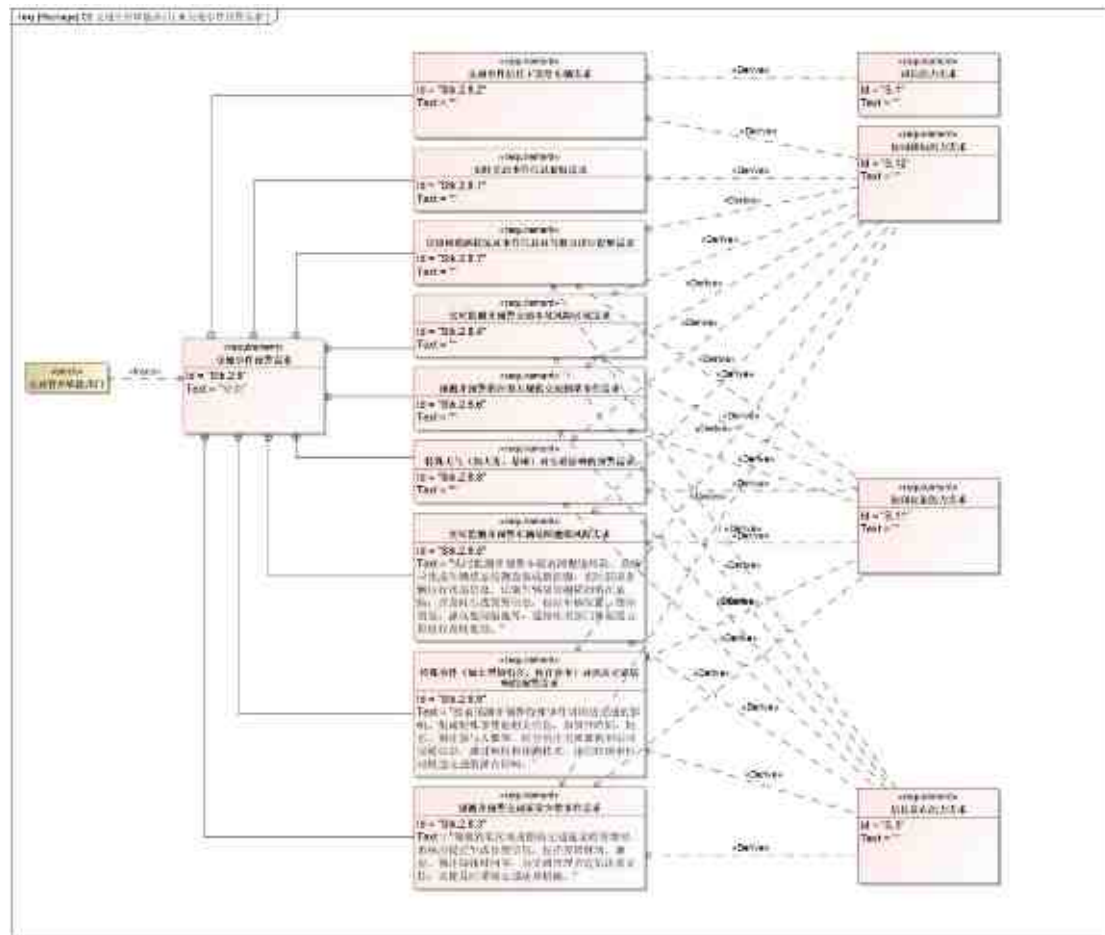




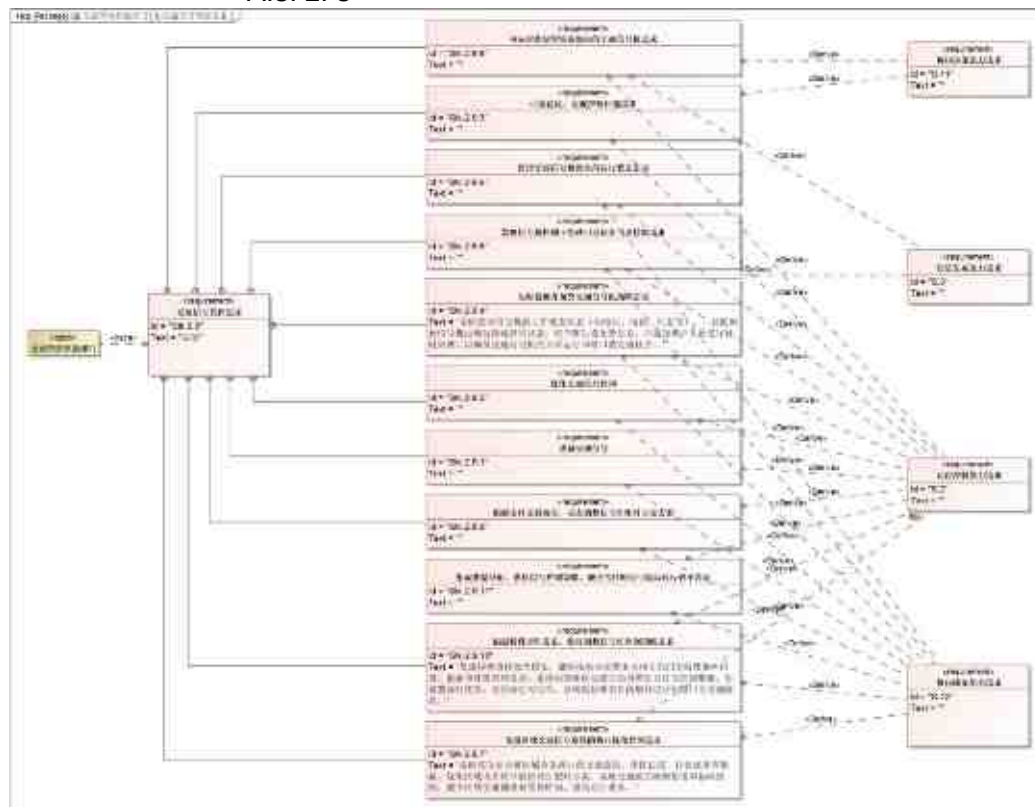


A.3.2.6

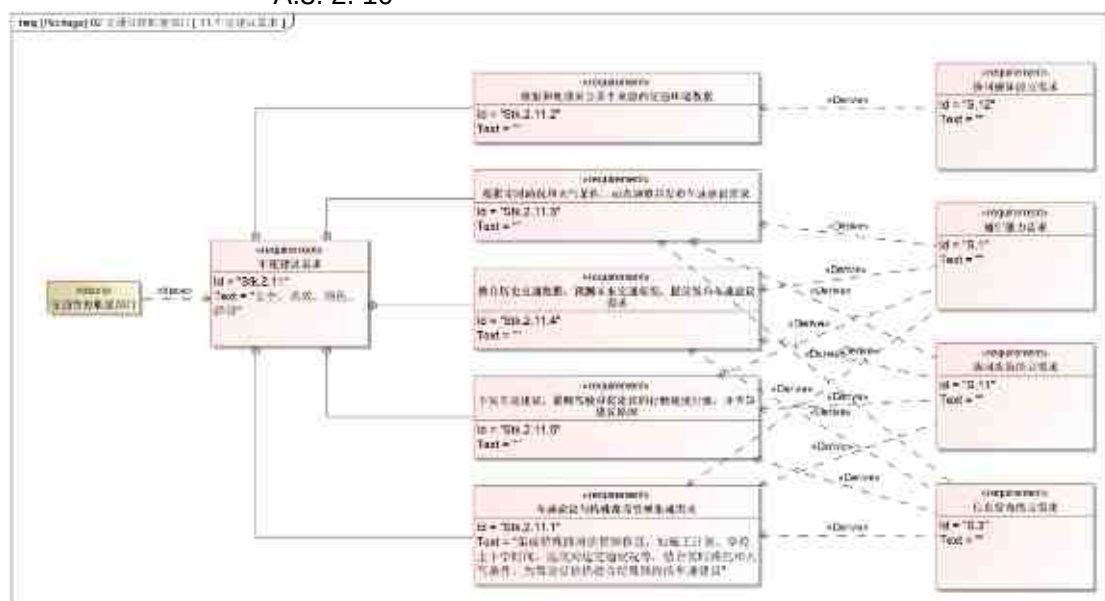
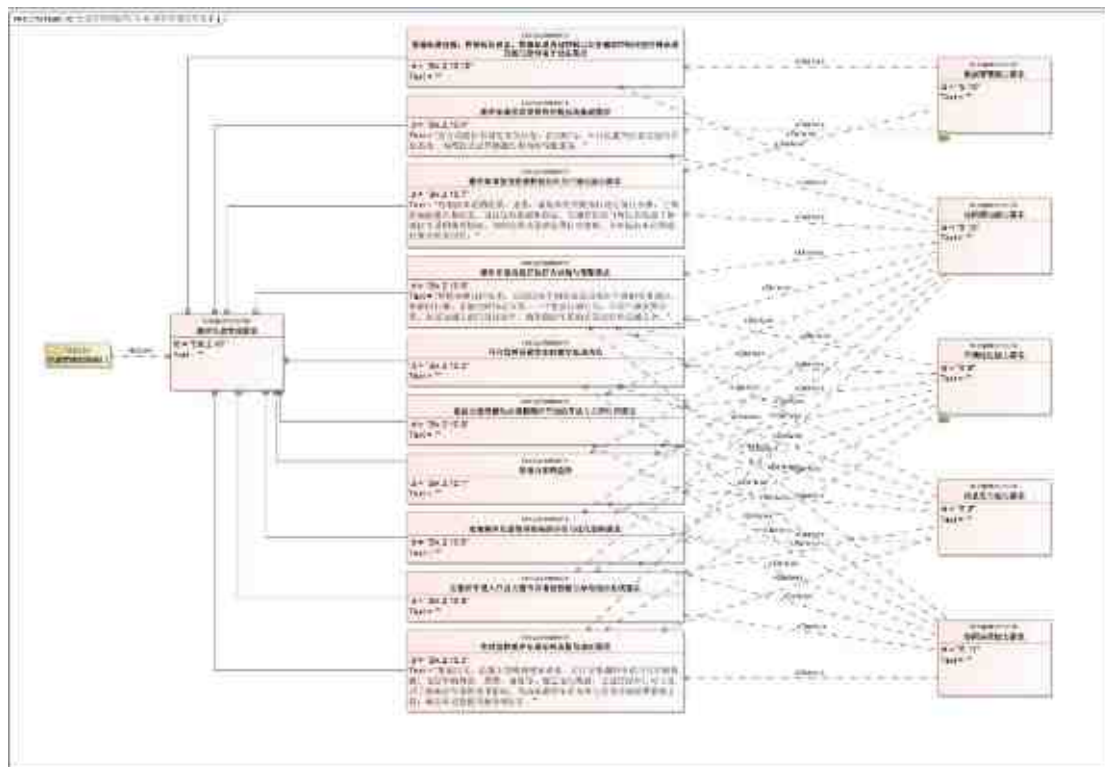


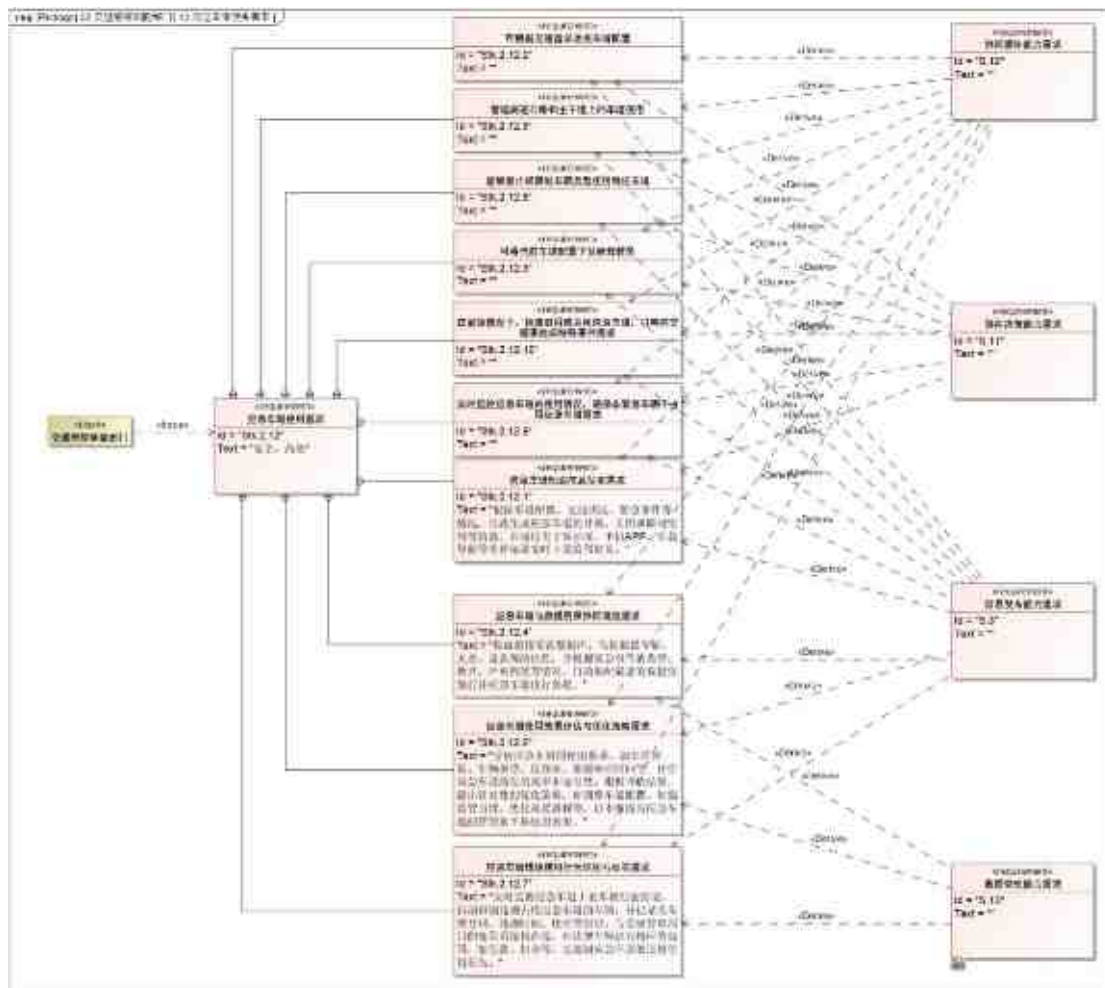


A.3. 2. 8



A.3. 2. 9

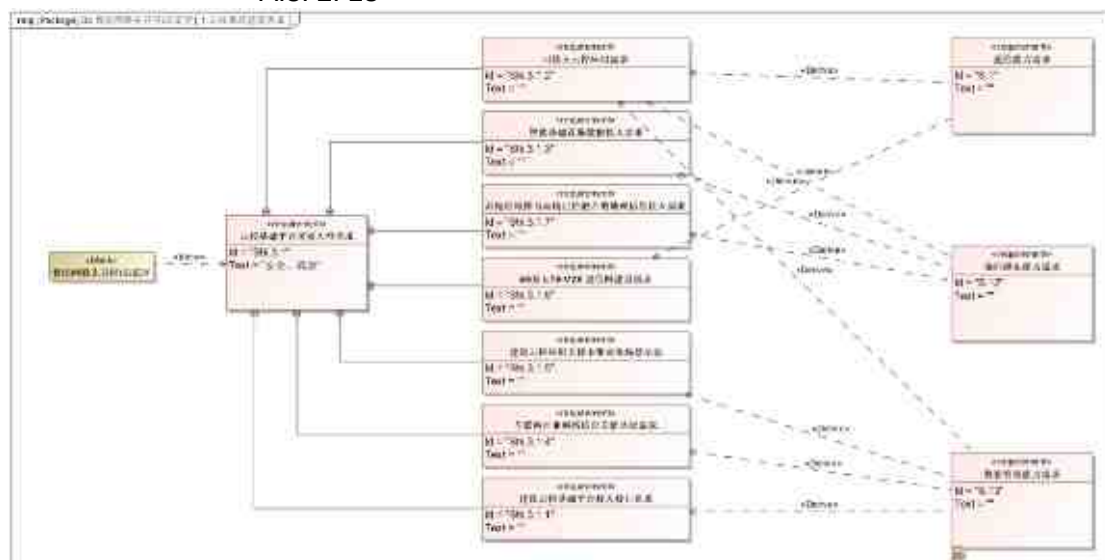
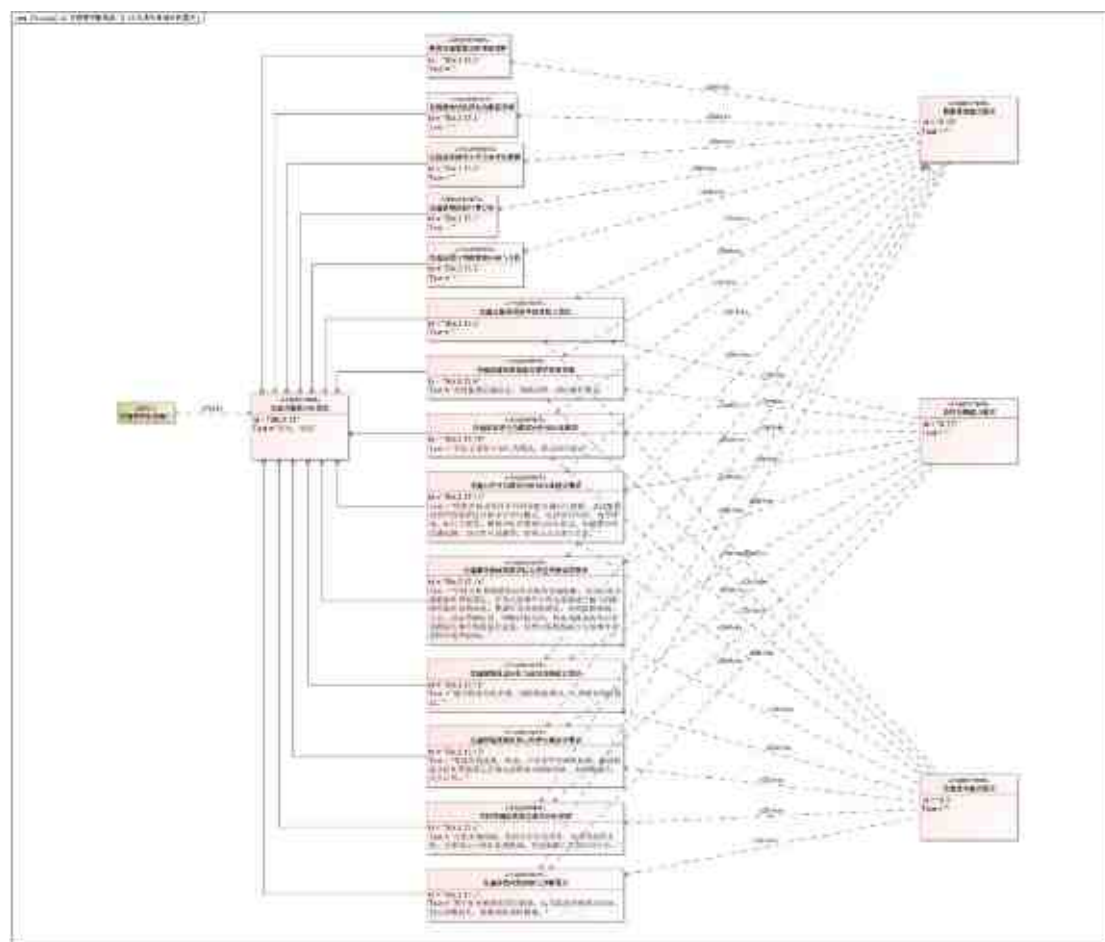


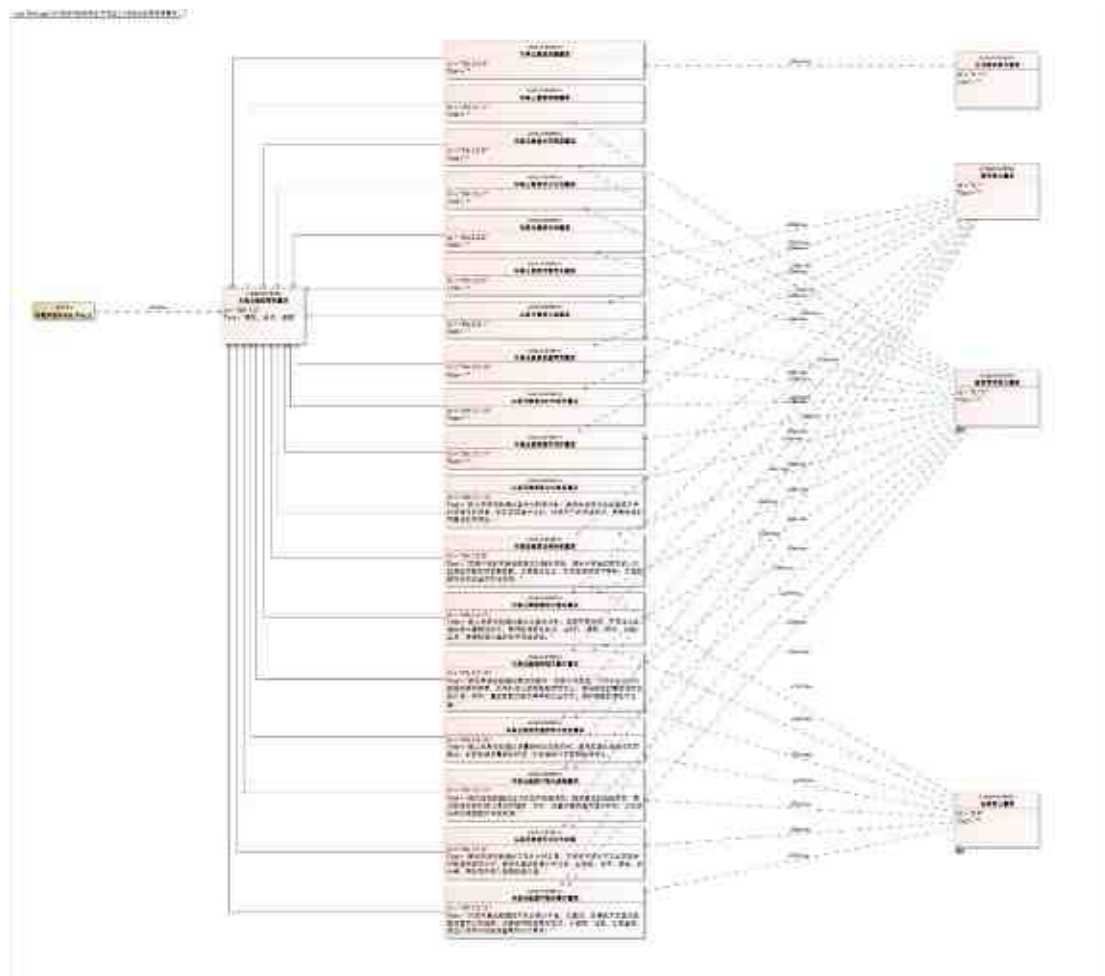


A.3. 2. 12

-

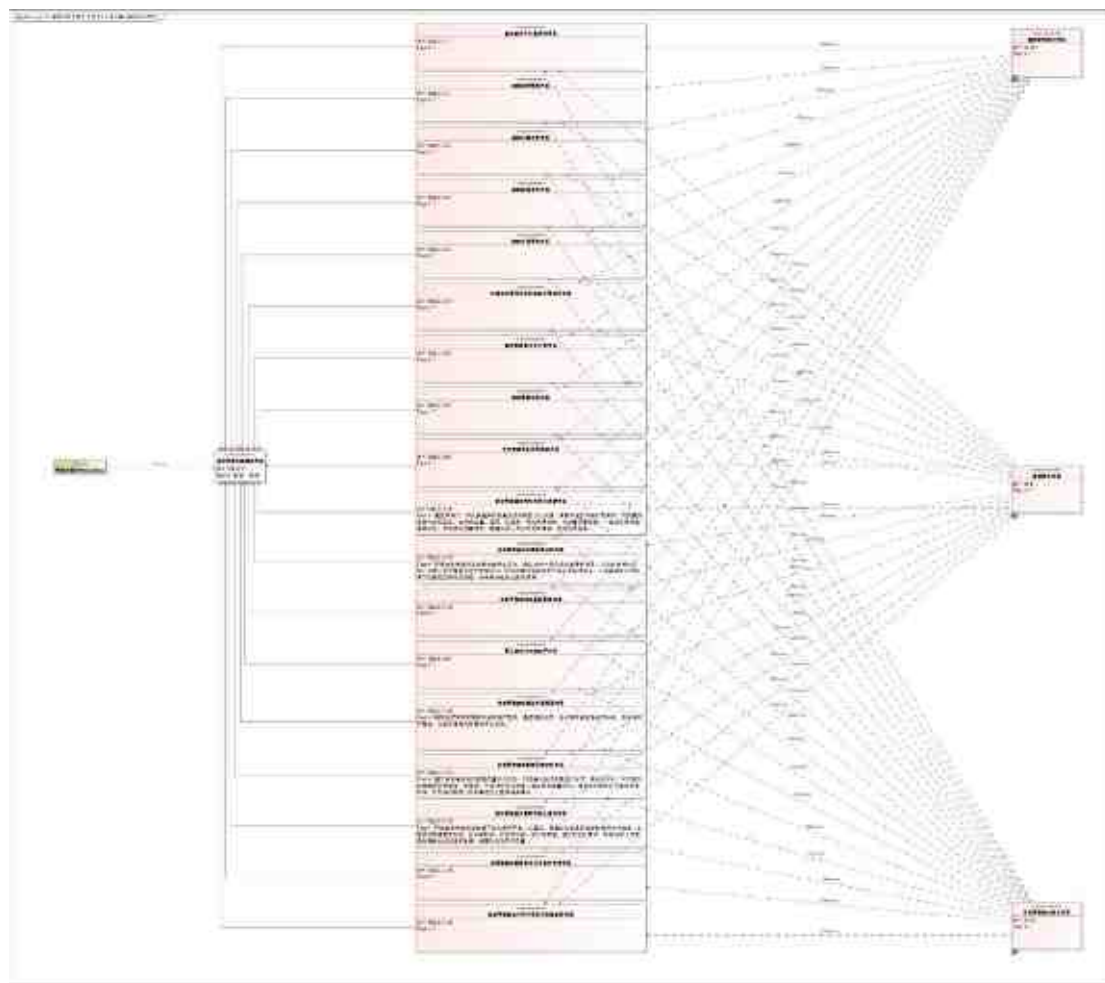






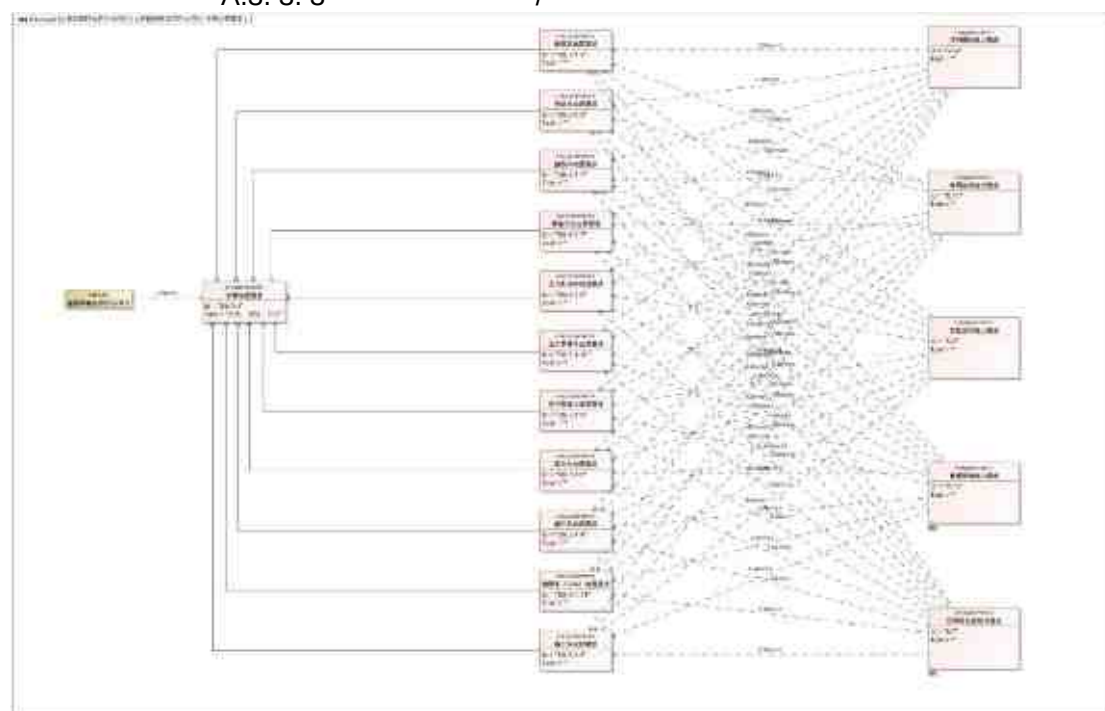
A.3.3.2 / -





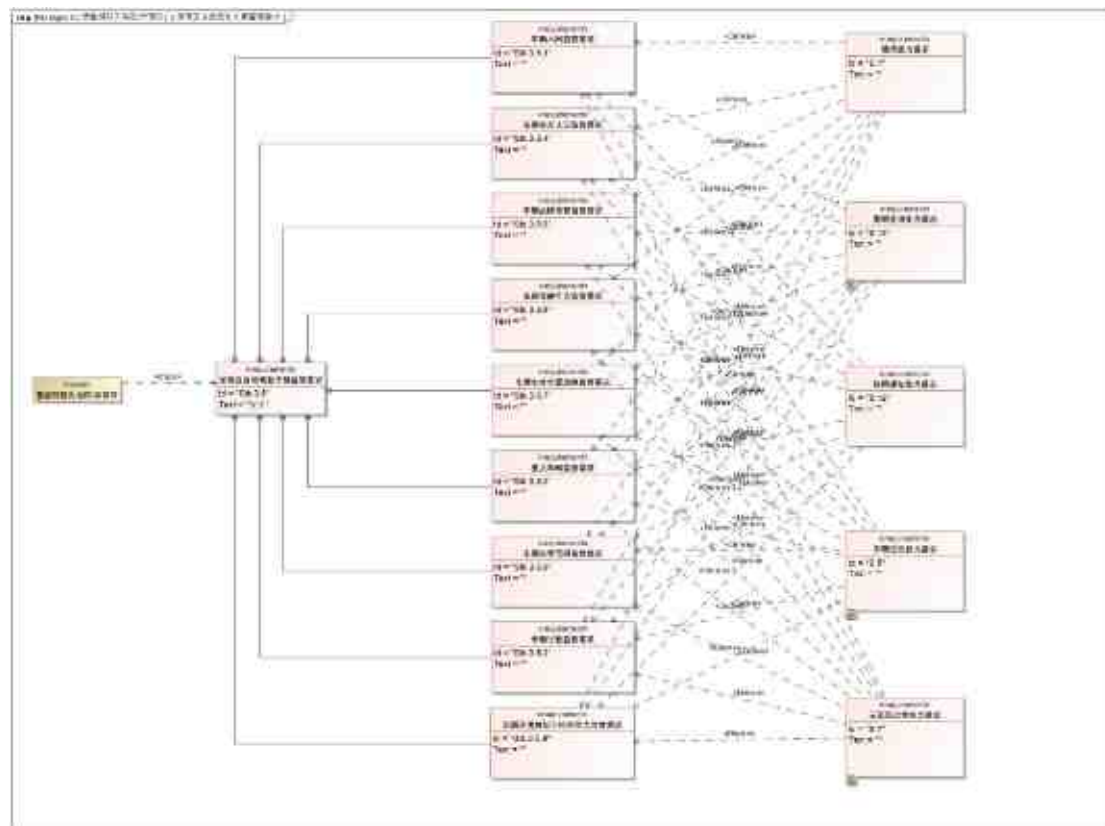
A.3.3.3

/ -



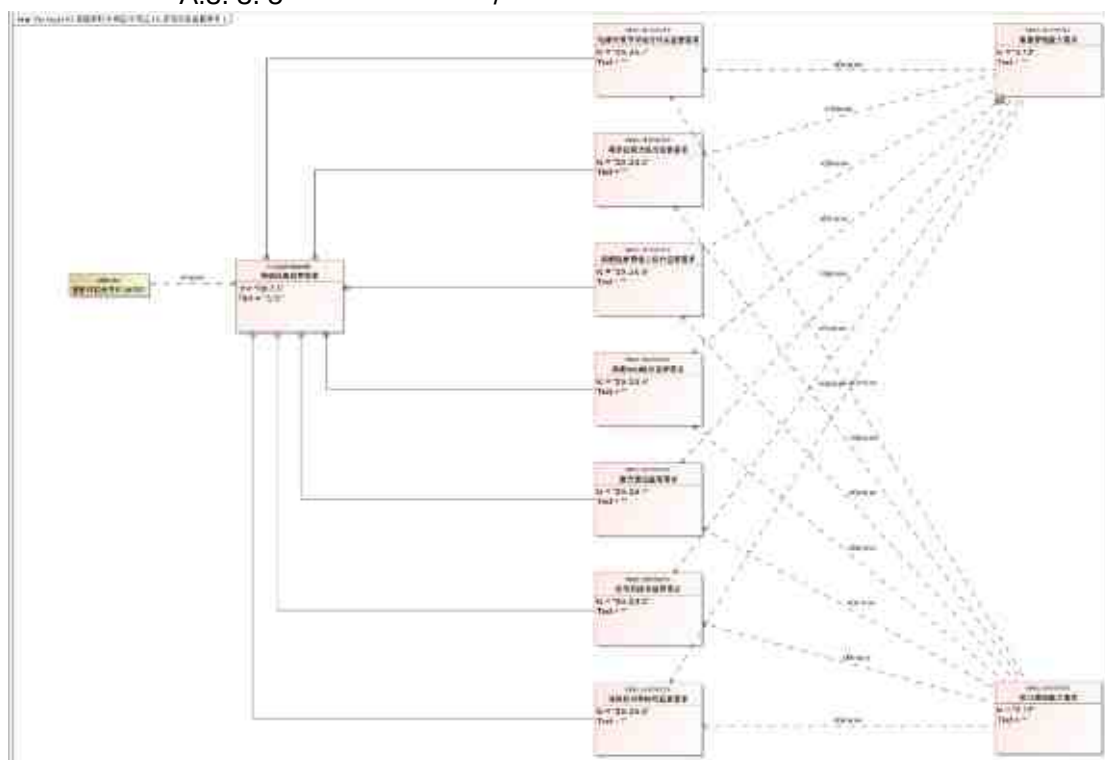
A.3.3.4

/ -



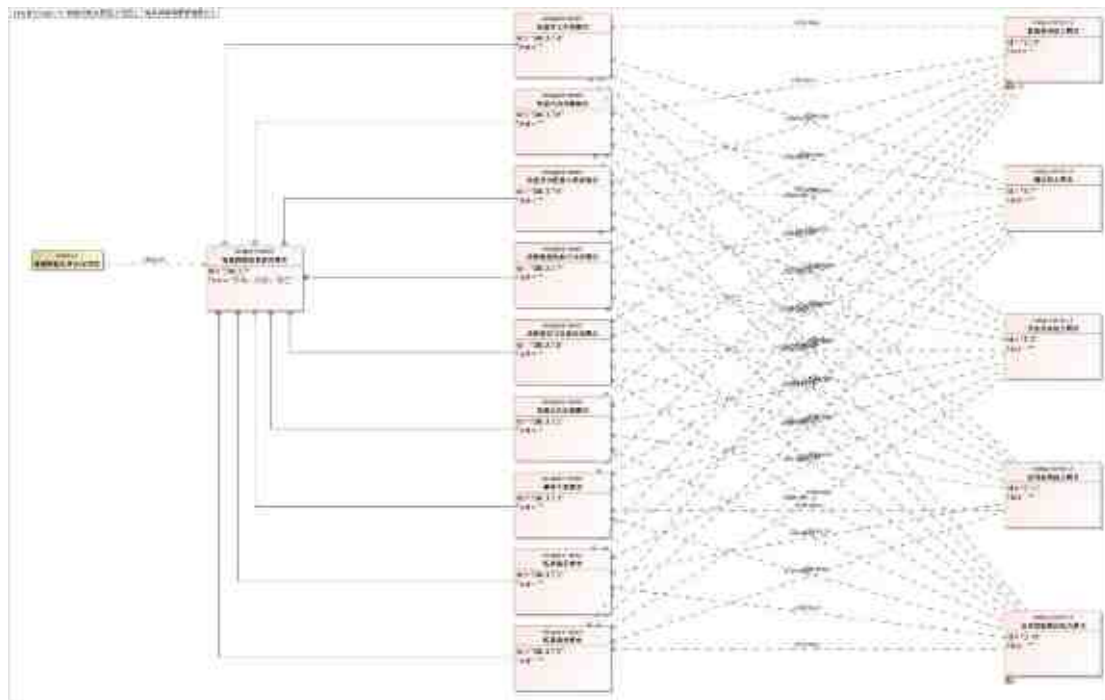
A.3. 3. 5

/ -



A.3. 3. 6

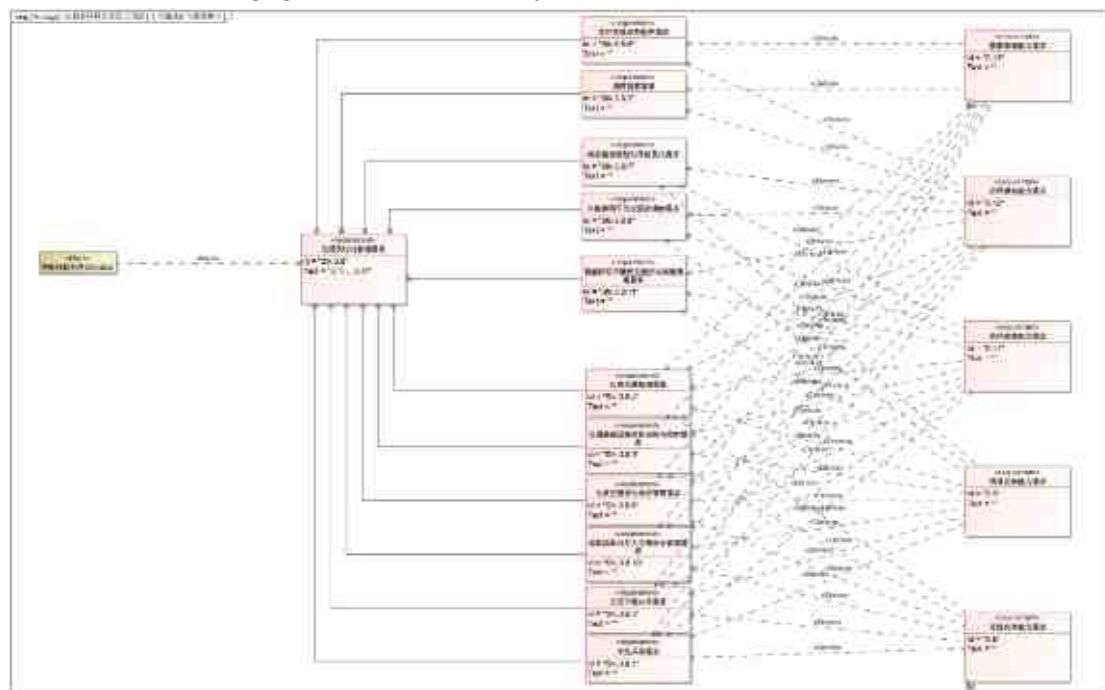
/ -



A.3.3.7

/

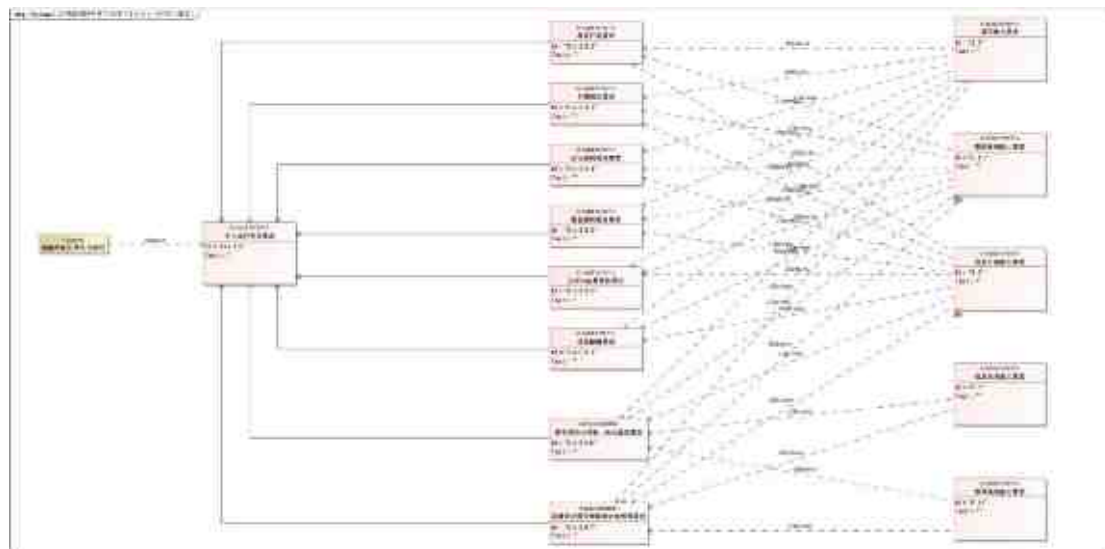
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A.3.3.8

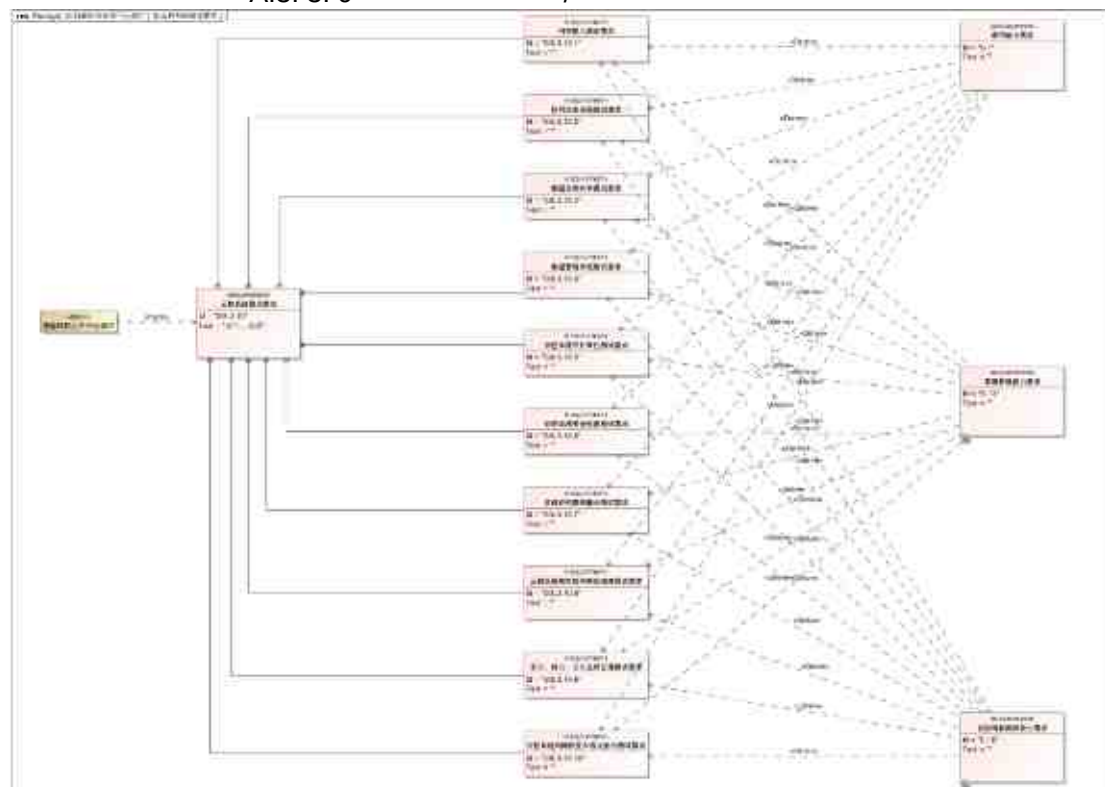
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-



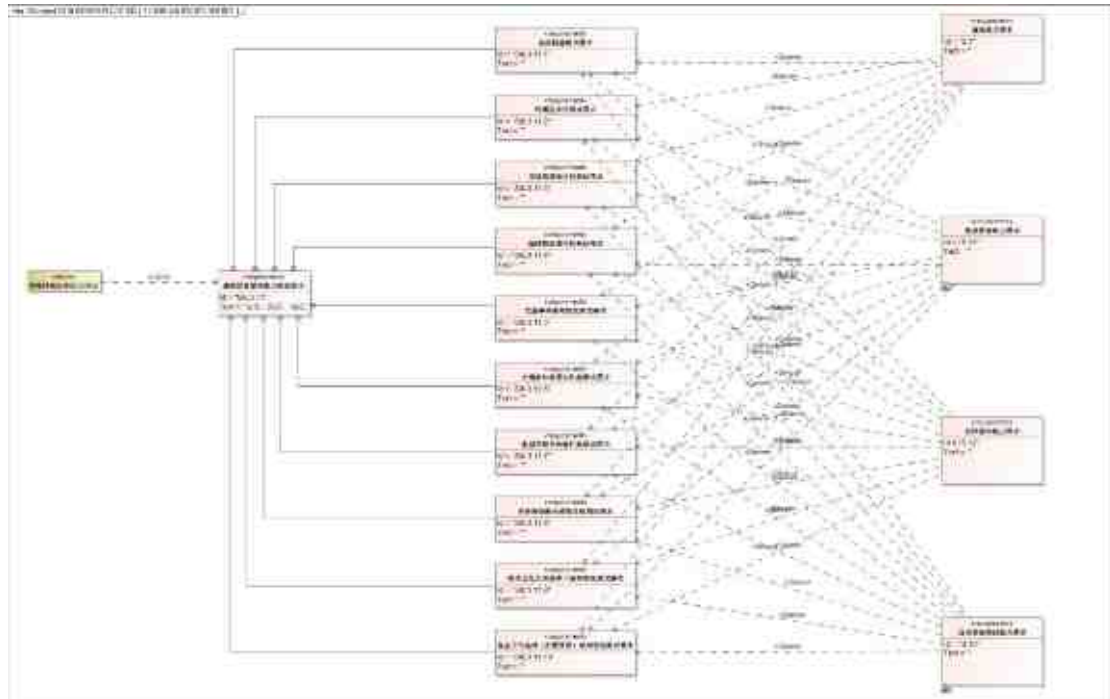
A.3. 3. 9

/ -



A.3. 3. 10

/ -



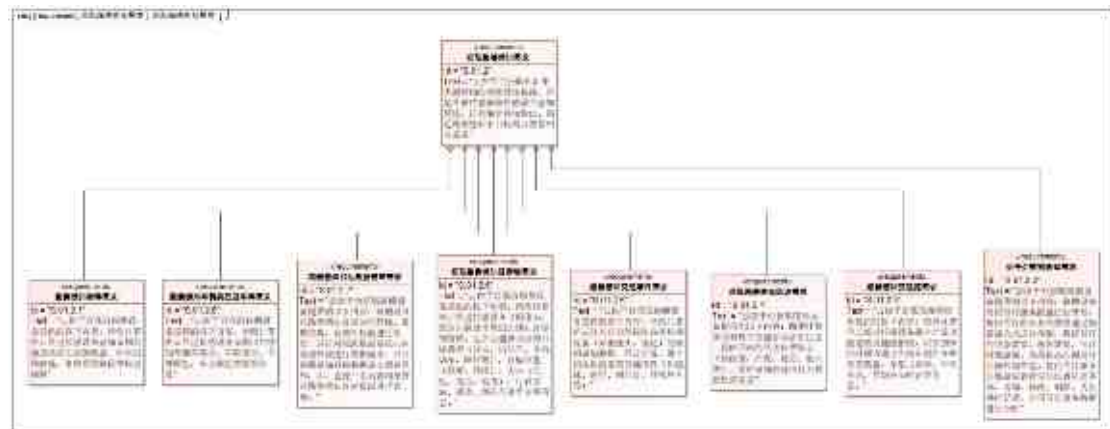
A.3.3.11

/ -

## A.4



A.4.1.1

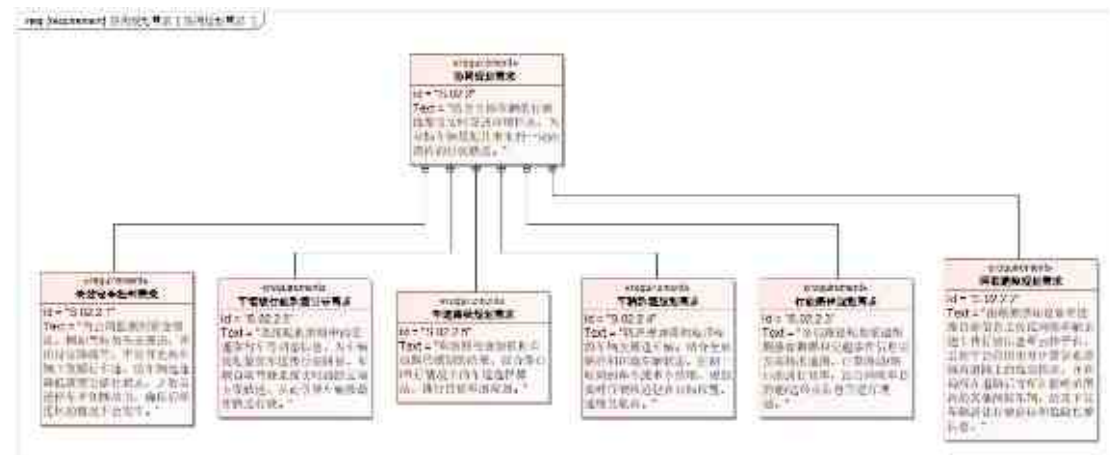


A.4.1.2

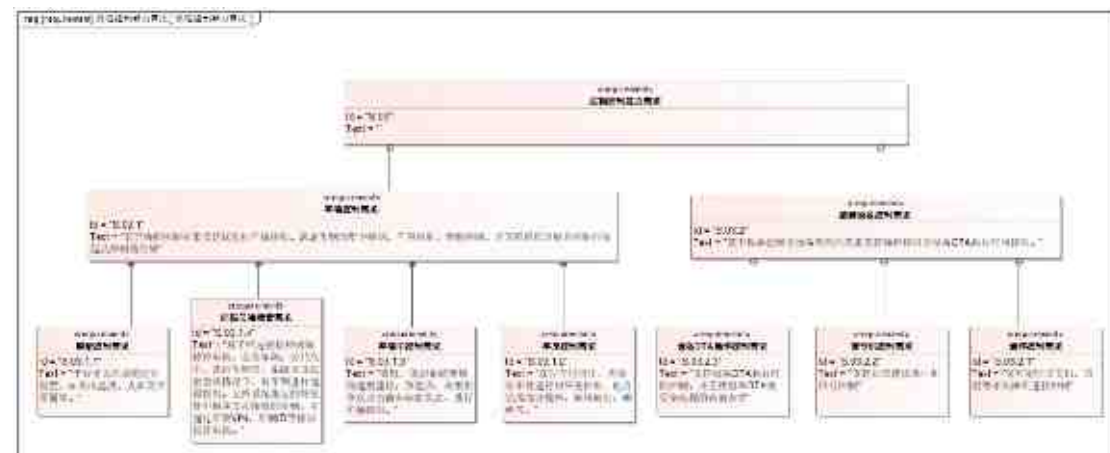


[illegible]

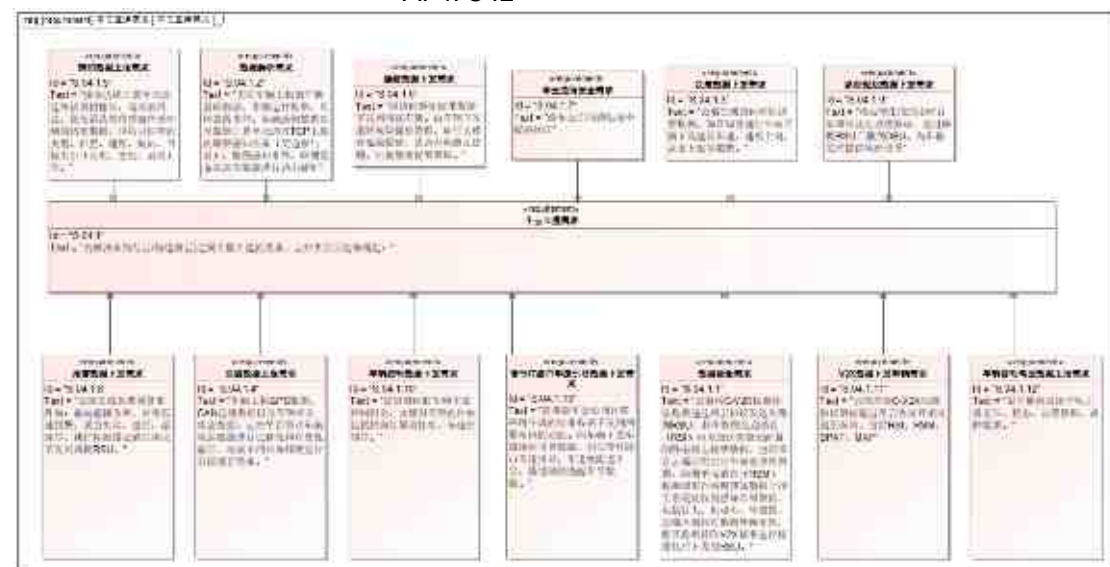
## 238



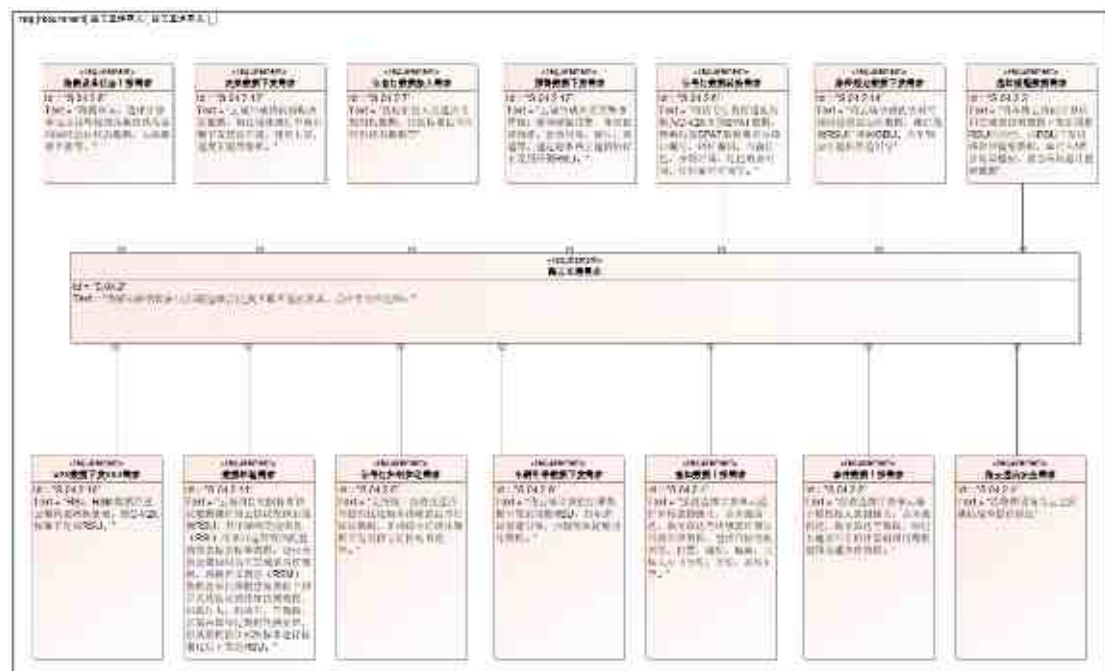
A. 4.2.2



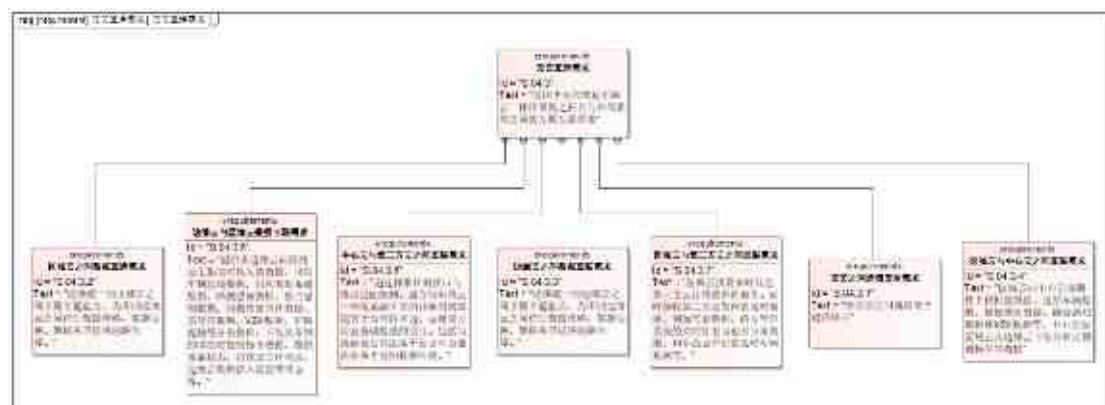
A. 4.3.1



A. 4.4.1

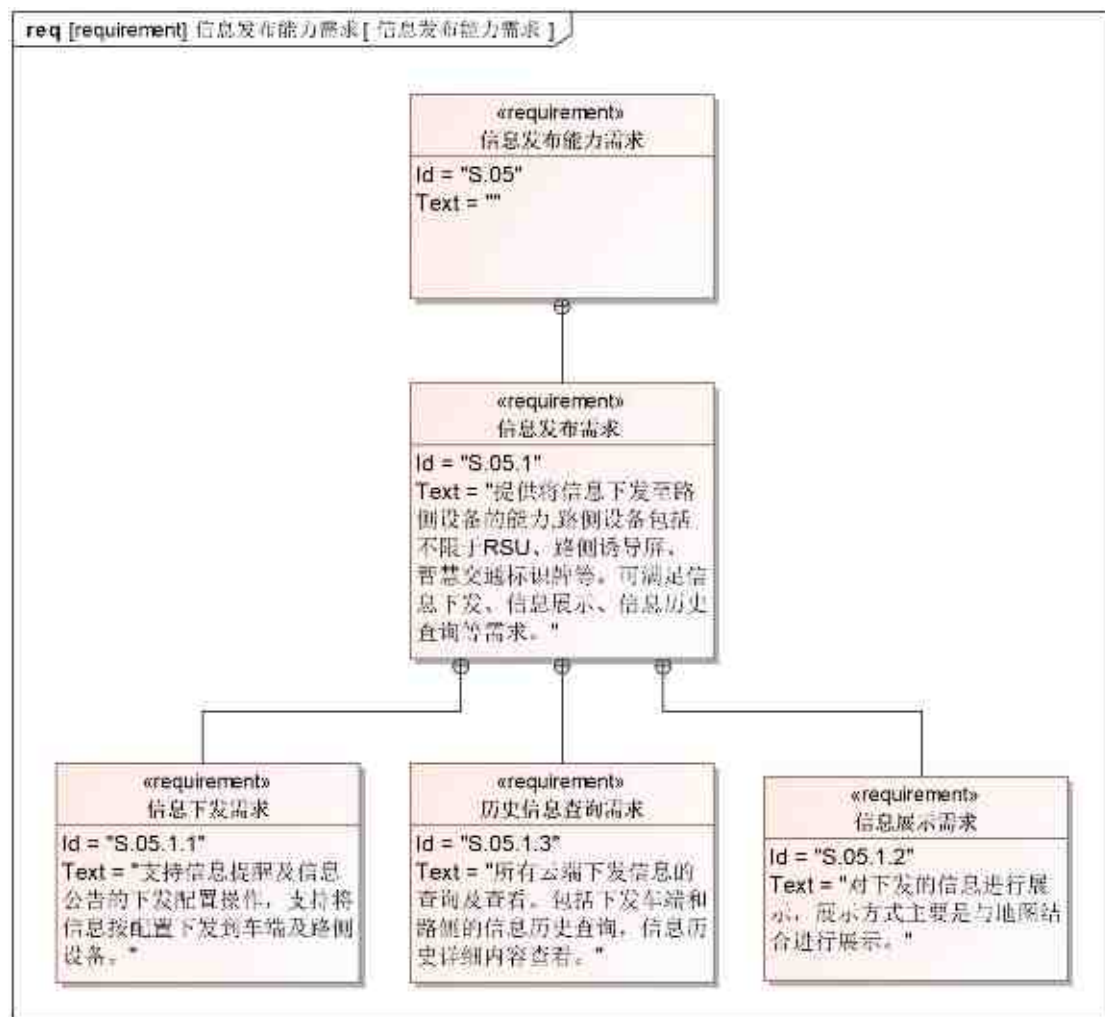


A. 4. 4. 2

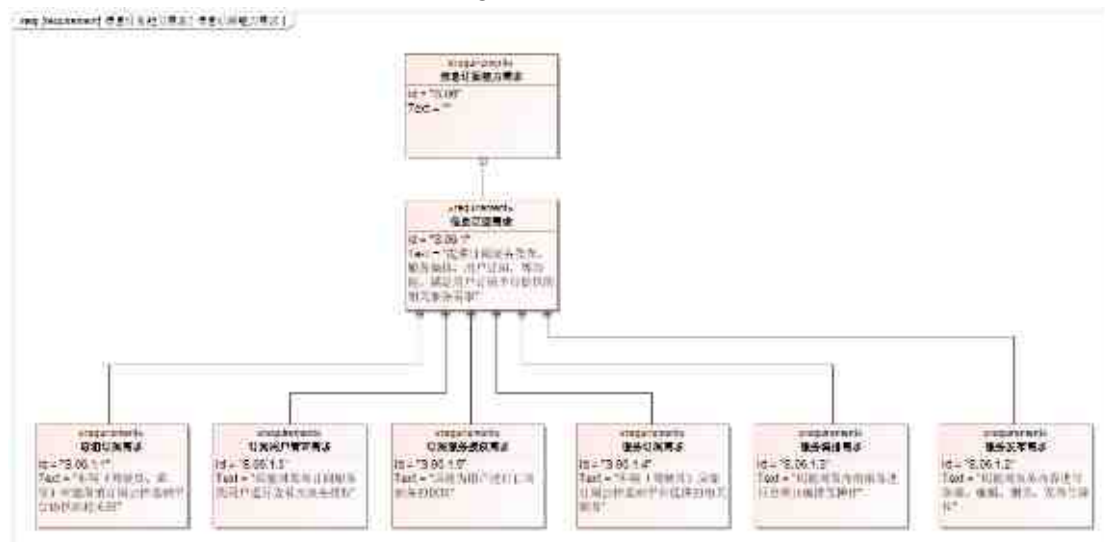


A. 4. 4. 3





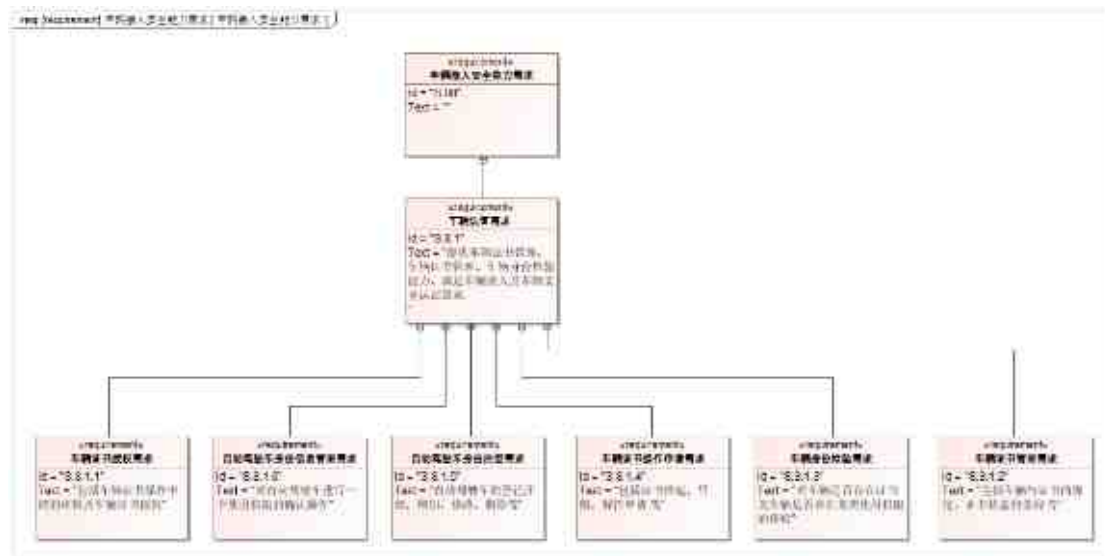
A. 4. 5



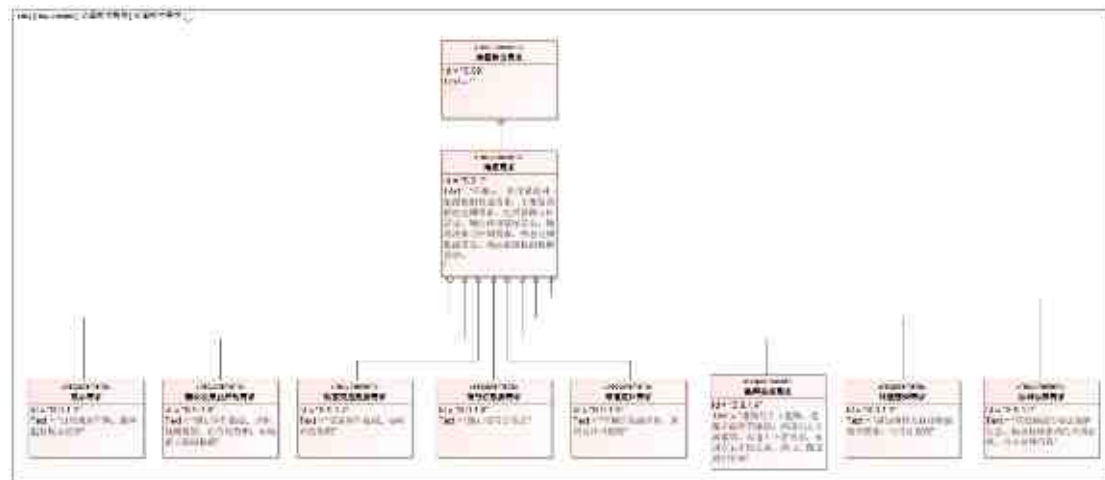
A. 4. 6



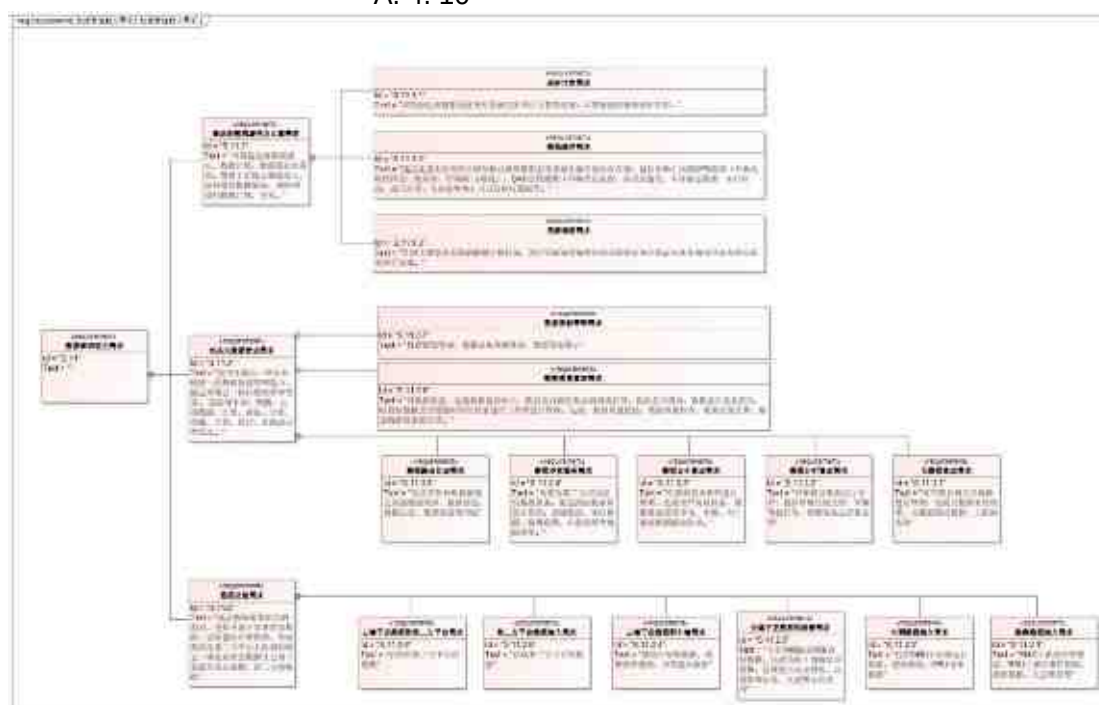
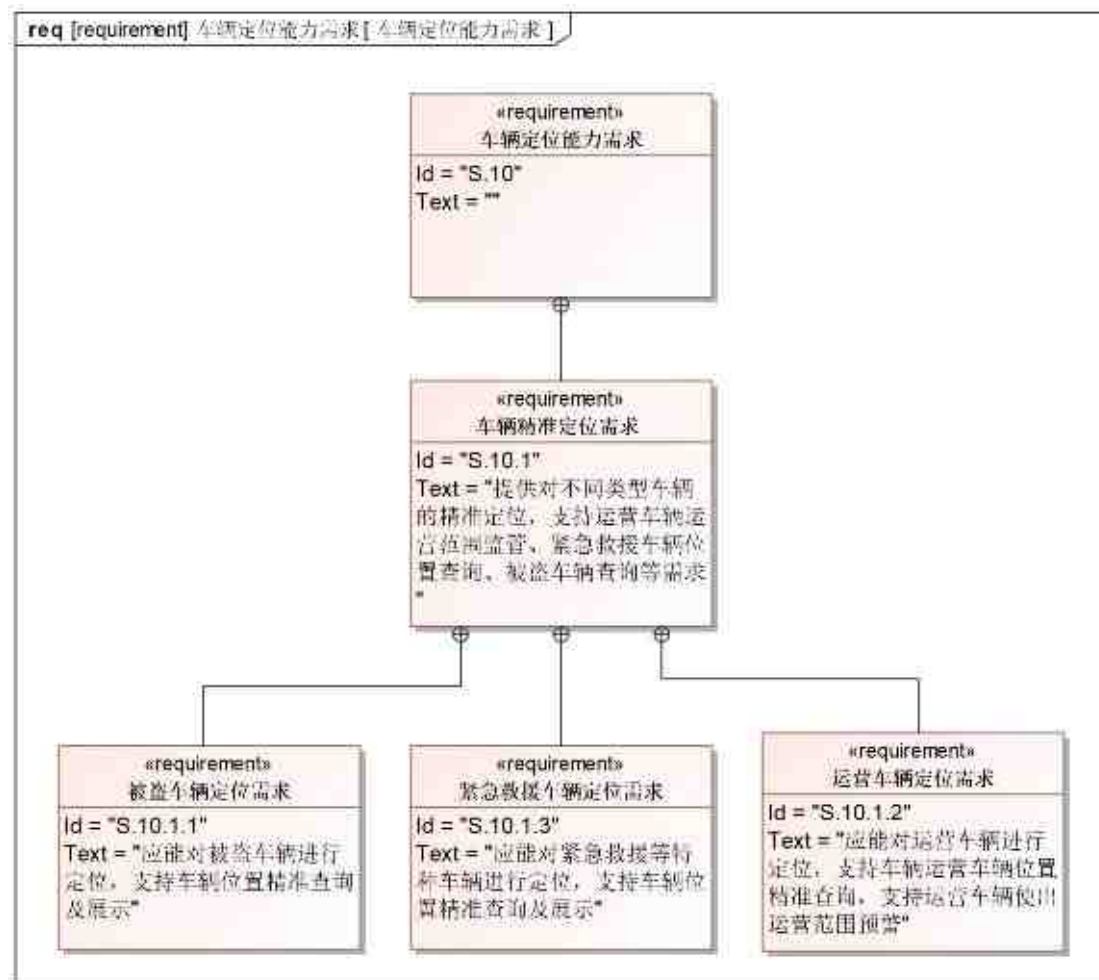
A. 4. 7

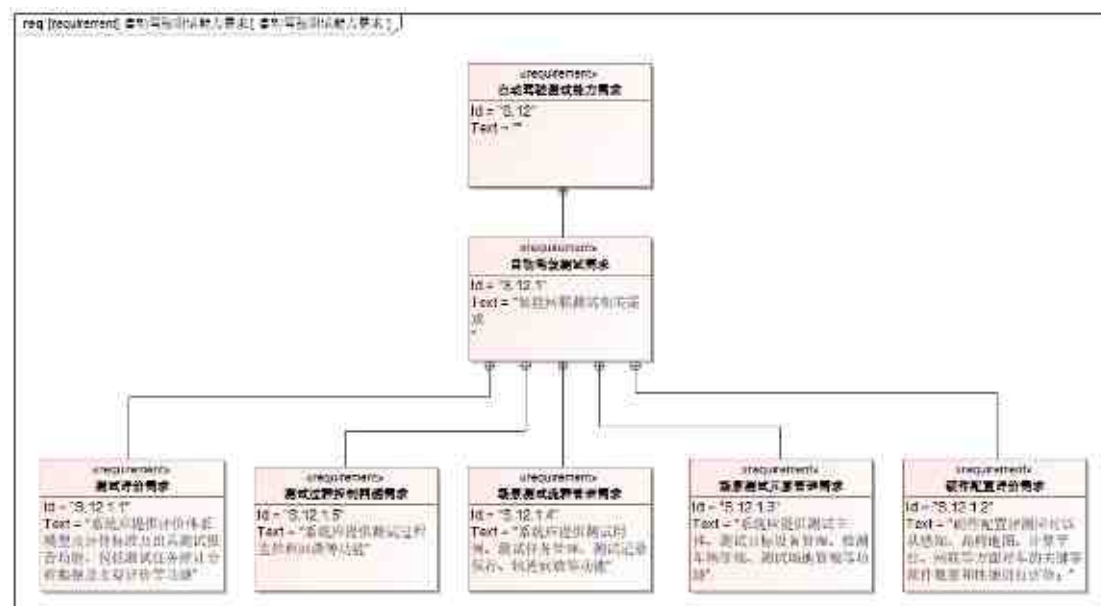


A. 4. 8

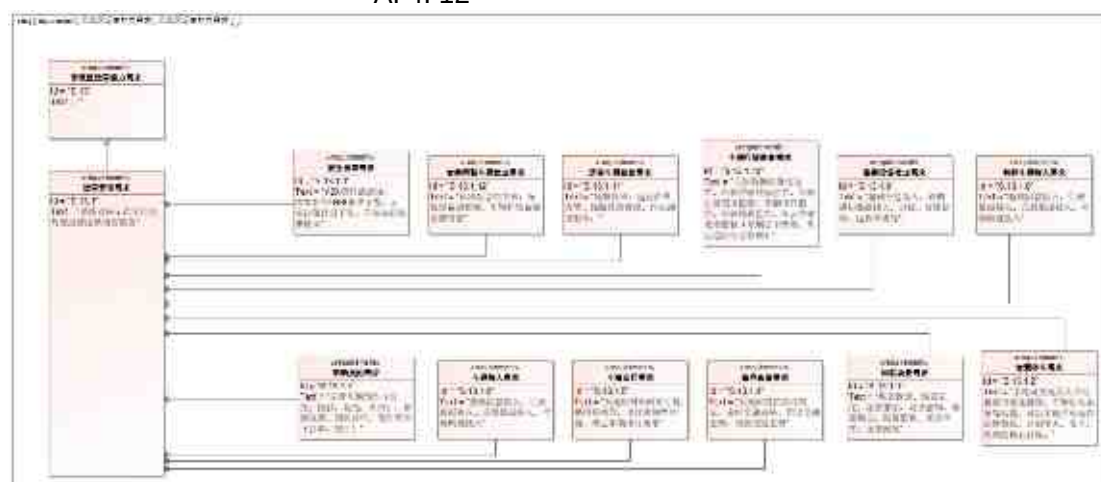


A. 4. 9





A. 4. 12

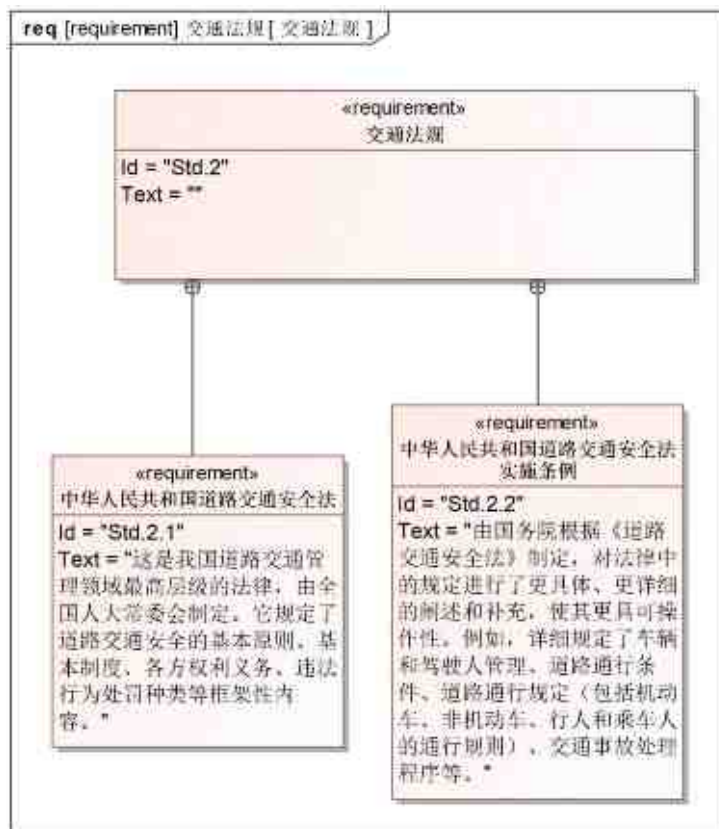


A. 4. 13

## A.5

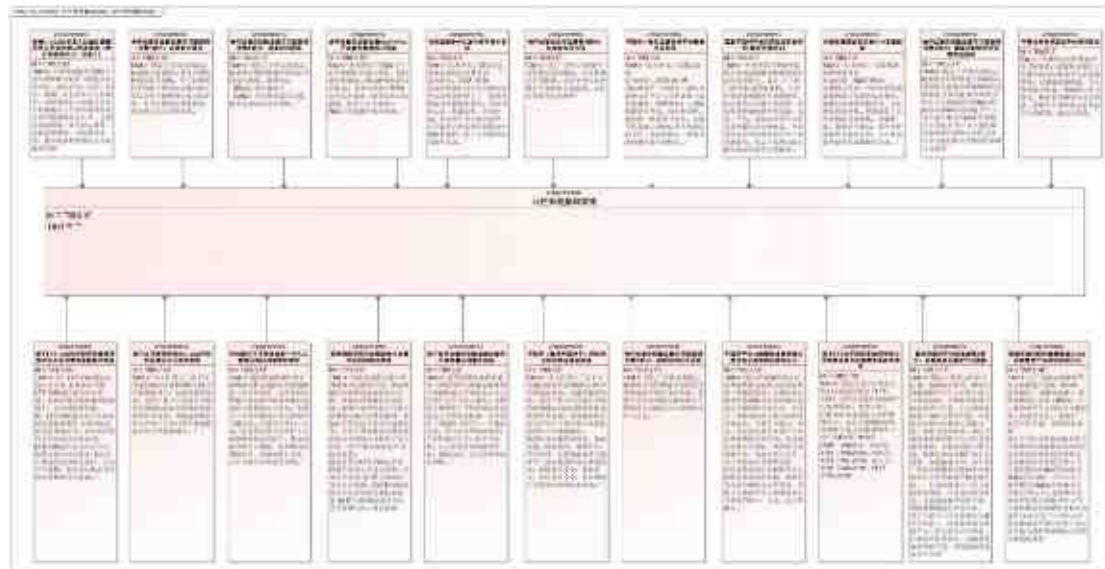


A. 5. 1

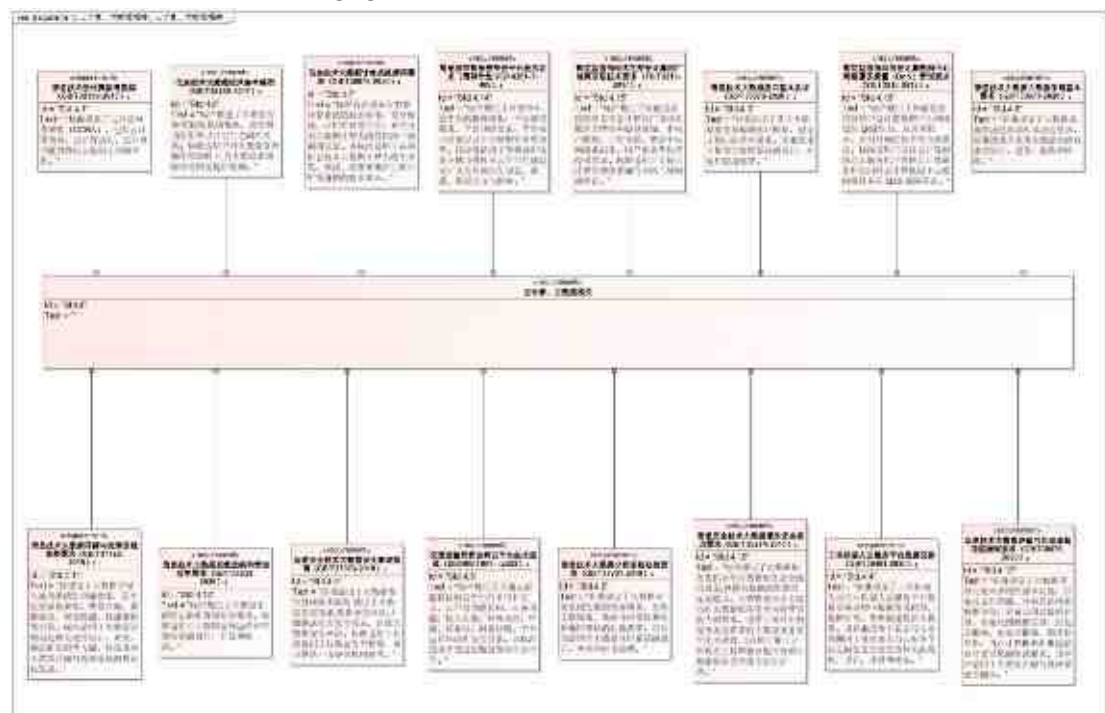


A. 5. 2





A. 5. 3



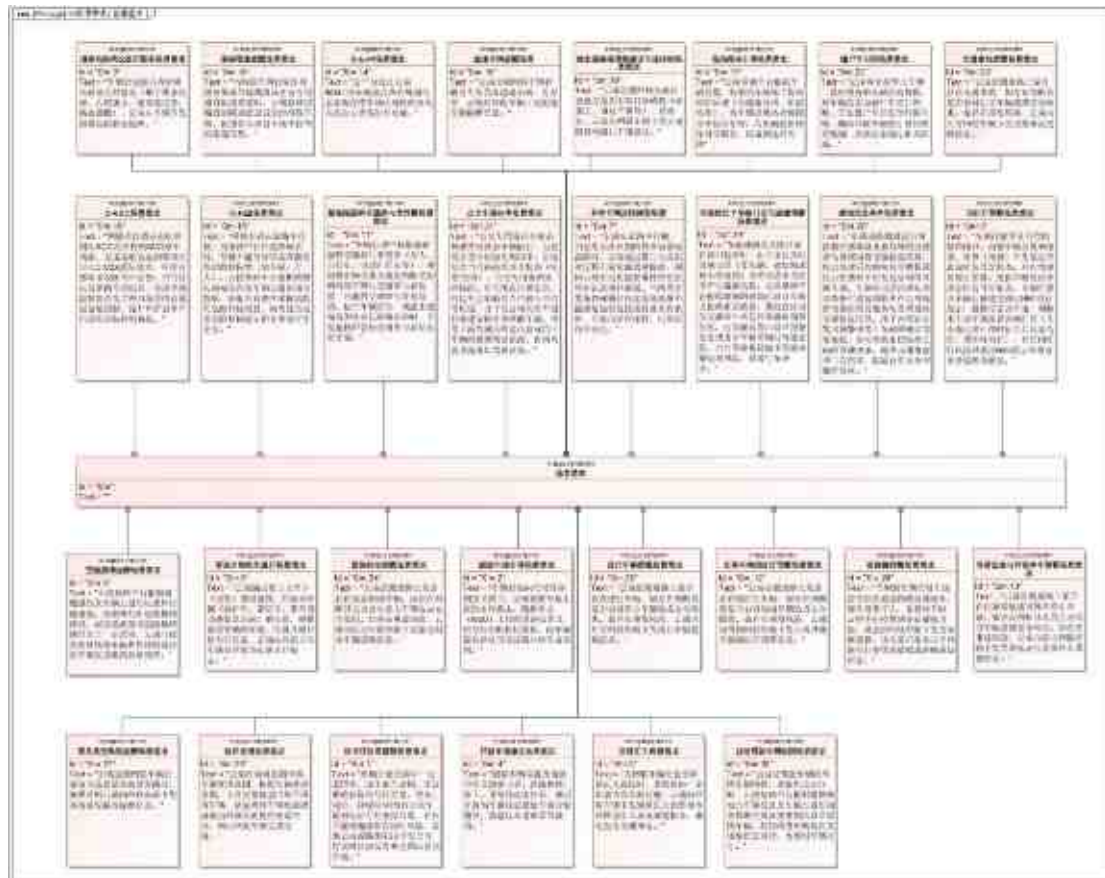
A. 5. 4





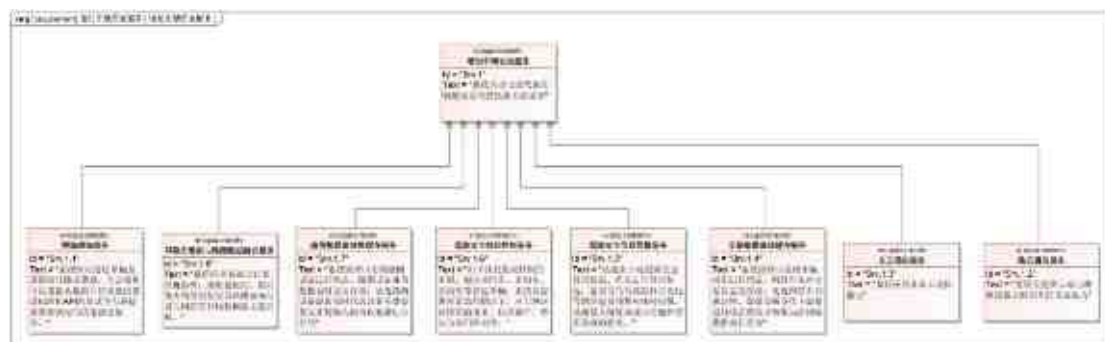


## A.6

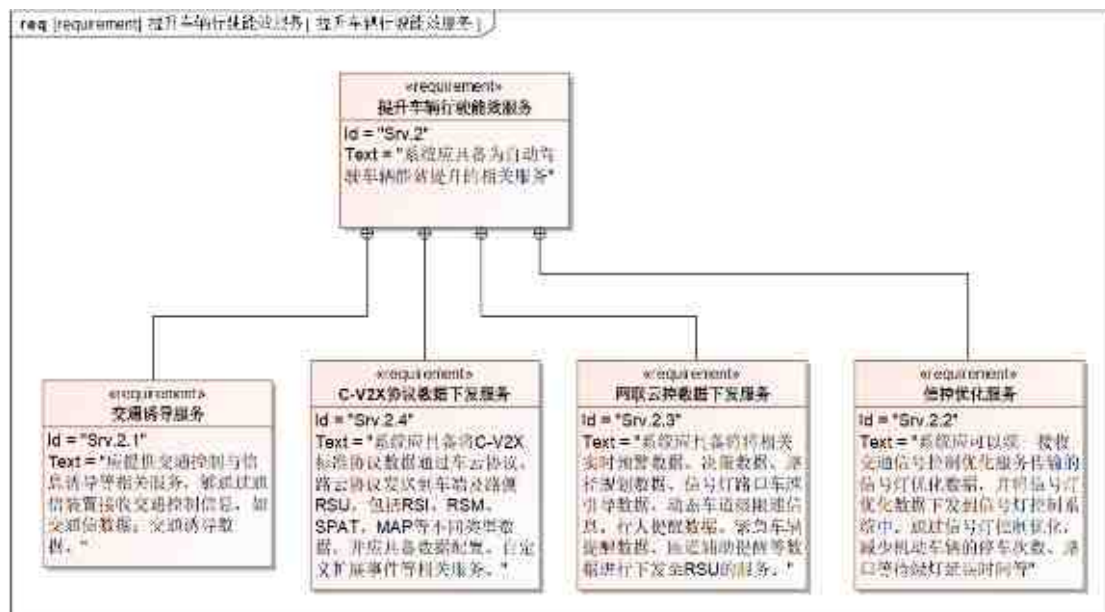


A.6.1

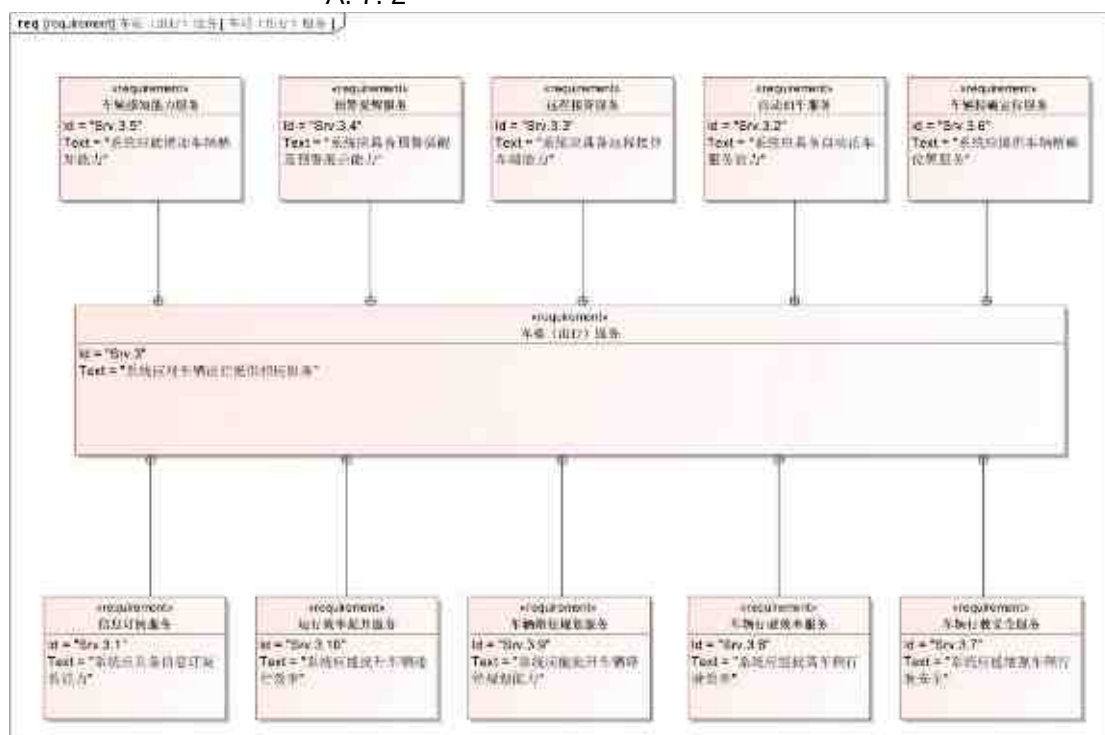
## A.7



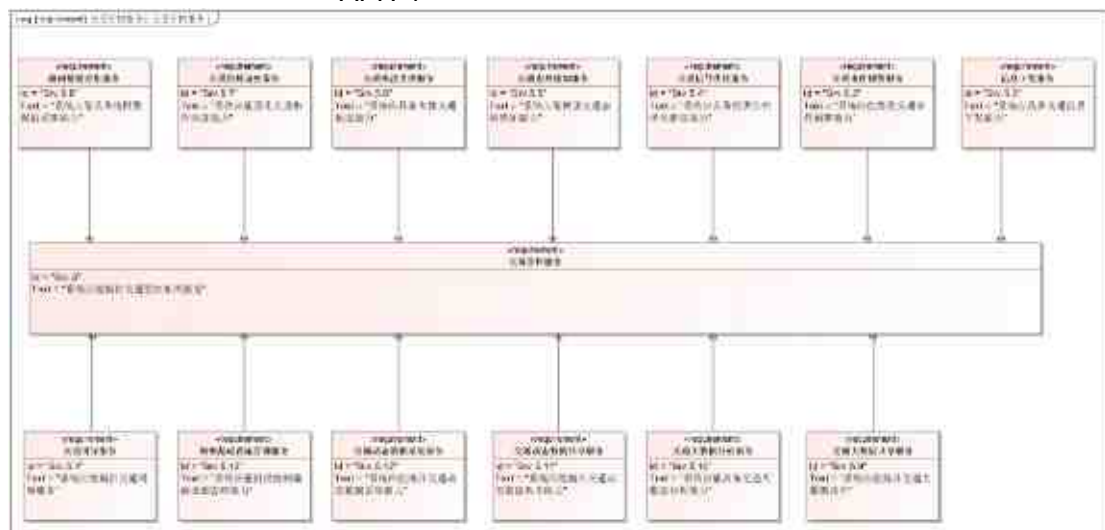
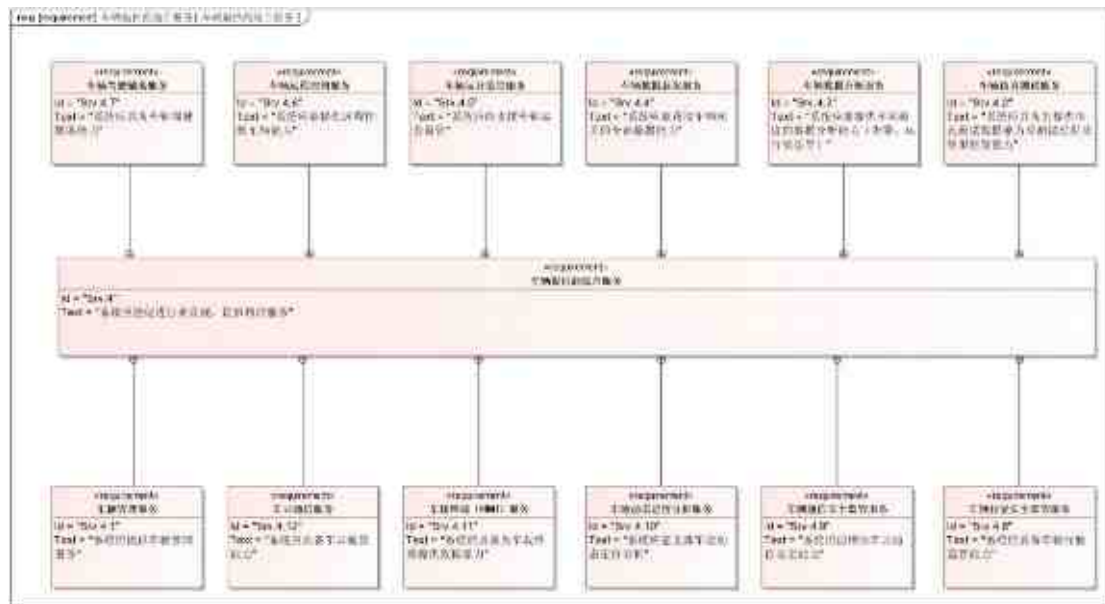
A.7.1



A. 7. 2



A. 7. 3





A. 7. 7 V2X

## A.8

| Legend             |                  |           |           |           |           |           |
|--------------------|------------------|-----------|-----------|-----------|-----------|-----------|
| DeriveReq          |                  |           |           |           |           |           |
|                    |                  | 安全        | 效率        | 便捷        | 绿色        | 经济        |
|                    |                  | Req a     | Req b     | Req c     | Req d     | Req e     |
| S1k 云控基础平台用户需求     |                  |           |           |           |           |           |
| S1k.1 智能网联汽车用户需求   |                  |           |           |           |           |           |
| S1k.1.1            | 增强行驶车辆安全需求       | DeriveReq |           |           |           |           |
| S1k.1.2            | 提升车辆行驶能效需求       |           | DeriveReq |           | DeriveReq |           |
| S1k.1.3            | 改善用户出行体验需求       | DeriveReq | DeriveReq | DeriveReq |           |           |
| S1k.1.4            | 智能网联车辆全量数据采集需求   | DeriveReq |           |           |           |           |
| S1k.1.5            | 智能网联车辆全量数据分析需求   |           | DeriveReq |           |           | DeriveReq |
| S1k.1.6            | 智能驾驶车辆行驶安全监控需求   | DeriveReq | DeriveReq |           |           |           |
| S1k.1.7            | 智能驾驶车辆运营监管需求     |           | DeriveReq |           |           | DeriveReq |
| S1k.1.8            | 通信安全监控-车云需求      | DeriveReq | DeriveReq |           |           |           |
| S1k.1.9            | 通信安全监控-车路需求      | DeriveReq |           |           |           |           |
| S1k.1.10           | 通信安全监控-车车需求      | DeriveReq |           |           |           |           |
| S1k.1.11           | 智能驾驶车辆行驶交通环境监控需求 | DeriveReq | DeriveReq |           |           | DeriveReq |
| S1k.1.12           | 搭建智能驾驶仿真测试环境需求   |           |           |           |           | DeriveReq |
| S1k.1.13           | 智能驾驶远程云端接管需求     | DeriveReq |           |           |           |           |
| S1k.1.14           | 智能网联车辆接入管理需求     | DeriveReq |           |           |           | DeriveReq |
| S1k.2 交通管控职能部门用户需求 |                  |           |           |           |           |           |
| S1k.2.1            | 交通监控需求           |           |           |           | DeriveReq | DeriveReq |
| S1k.2.2            | 交通流量统计需求         | DeriveReq | DeriveReq |           |           |           |
| S1k.2.3            | 交通信息发布需求         |           |           | DeriveReq |           |           |
| S1k.2.4            | 区域交通管理需求         |           |           |           |           | DeriveReq |
| S1k.2.5            | 交通事故管理及追溯需求      | DeriveReq |           |           |           | DeriveReq |
| S1k.2.6            | 运营决策支持需求         |           | DeriveReq |           | DeriveReq | DeriveReq |
| S1k.2.7            | 违章管理需求           | DeriveReq |           |           |           |           |
| S1k.2.8            | 交通事件预警需求         | DeriveReq |           |           |           |           |
| S1k.2.9            | 交通信号管控需求         |           | DeriveReq |           |           |           |
| S1k.2.10           | 潮汐车道管理需求         |           | DeriveReq |           |           |           |
| S1k.2.11           | 车路建设需求           | DeriveReq | DeriveReq |           | DeriveReq | DeriveReq |
| S1k.2.12           | 存量车道使用需求         | DeriveReq | DeriveReq |           |           |           |
| S1k.2.13           | 交通大数据分析需求        |           | DeriveReq |           |           | DeriveReq |
| S1k.3 智能网联先导区/示范区  |                  |           |           |           |           |           |
| S1k.3.1            | 云控基础平台可接入性需求     | DeriveReq | DeriveReq |           |           |           |
| S1k.3.2            | 车路云数据管理需求        |           | DeriveReq | DeriveReq |           | DeriveReq |
| S1k.3.3            | 自动驾驶车辆测试需求       | DeriveReq |           |           |           | DeriveReq |
| S1k.3.4            | 车辆运营需求           |           | DeriveReq | DeriveReq |           | DeriveReq |
| S1k.3.5            | 示范区自动驾驶车辆监管需求    | DeriveReq |           |           |           |           |
| S1k.3.6            | 基础设施监管需求         | DeriveReq |           |           |           |           |
| S1k.3.7            | 智能网联场景管理需求       | DeriveReq |           |           | DeriveReq | DeriveReq |
| S1k.3.8            | 交通优化与管理需求        | DeriveReq | DeriveReq |           |           |           |
| S1k.3.9            | 个人出行优化需求         |           |           | DeriveReq |           |           |
| S1k.3.10           | 云控系统测试需求         | DeriveReq | DeriveReq |           |           |           |
| S1k.3.11           | 路侧设备感知能力测试需求     | DeriveReq |           |           | DeriveReq | DeriveReq |

A.8.1

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| Legend           |                  | S.01     | S.02     | S.03     | S.04   | S.05     | S.06     | S.07     | S.08       | S.09   | S.10     | S.11     | S.12       |
|------------------|------------------|----------|----------|----------|--------|----------|----------|----------|------------|--------|----------|----------|------------|
| Derive           |                  | 协同感知能力需求 | 协同决策能力需求 | 协同控制能力需求 | 通信能力需求 | 信息发布能力需求 | 信息订阅能力需求 | 分级共享能力需求 | 车辆接入安全能力需求 | 地图能力需求 | 车辆定位能力需求 | 数据管理能力需求 | 自动驾驶测试能力需求 |
| S.1 智能网联汽车用户需求   |                  |          |          |          |        |          |          |          |            |        |          |          |            |
| S.1.1 增强行驶车辆安全需求 |                  |          |          |          |        |          |          |          |            |        |          |          |            |
| S.1.1.1          | 感知目标物需求          | 1        |          |          |        |          |          |          |            |        |          |          |            |
| S.1.1.2          | 感知事件需求           | 1        |          |          |        |          |          |          |            |        |          |          |            |
| S.1.1.3          | 目标物提醒需求          | 1        |          |          |        |          |          |          |            |        |          |          |            |
| S.1.1.4          | 事件提醒需求           | 1        |          |          |        |          |          |          |            |        |          |          |            |
| S.1.1.5          | 获取云端决策建议需求       | 1        |          |          |        |          |          |          |            |        |          |          |            |
| S.1.1.6          | 远程控制需求           |          |          | 1        |        |          |          |          |            |        |          |          |            |
| S.1.1.7          | 紧急制动辅助需求         |          |          | 1        |        |          |          |          |            |        |          |          |            |
| S.1.1.8          | 盲点监测与提醒需求        | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.1.9          | 行车记录与证据需求        |          |          |          |        | 1        |          |          |            |        |          | 1        |            |
| S.1.1.10         | 行驶状态监测需求         |          |          |          |        | 1        |          |          |            |        |          | 1        |            |
| S.1.1.11         | 接管提醒需求           |          |          | 1        |        | 1        |          |          |            |        |          |          |            |
| S.1.1.12         | 网络传输安全防护需求       |          |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.1.13         | 实时交通信号获取与提醒需求    |          |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.1.14         | 行人与非机动车识别与避让需求   | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.1.15         | 车辆周围障碍物动态监测需求    | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.1.16         | 车路协同提醒与执行需求      | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.1.17         | 车道辅助驾驶与速度控制需求    |          |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.1.18         | 车辆故障诊断与预警需求      | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.1.19         | 紧急情况下自动避险操作需求    | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.1.20         | 车路云协同安全策略执行需求    | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.1.21         | 夜间或恶劣天气驾驶辅助需求    | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.2 提升车辆行驶能效需求 |                  |          |          |          |        |          |          |          |            |        |          |          |            |
| S.1.2.1          | 获取道路标识标识提示需求     | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.2.2          | 获取信号机数据需求        | 1        |          |          |        | 1        | 1        |          |            |        |          |          |            |
| S.1.2.3          | 获取实时交通态势提示需求     | 1        |          |          |        | 1        | 1        |          |            |        |          |          |            |
| S.1.2.4          | 获取紧急动态事件提示需求     | 1        |          |          |        | 1        | 1        |          |            |        |          |          |            |
| S.1.2.5          | 优化行驶路线以降低能耗需求    | 1        |          |          |        | 1        | 1        |          |            |        |          |          |            |
| S.1.2.6          | 实时监测并调整驾驶行为以节能需求 | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.2.7          | 获取车辆能耗数据分析需求     | 1        |          |          |        |          |          |          |            |        |          | 1        |            |
| S.1.2.8          | 智能车速控制以节能需求      | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.2.9          | 预测性驾驶辅助以节能需求     | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.2.10         | 获取绿色驾驶建议需求       | 1        |          |          |        |          |          |          |            |        |          | 1        |            |
| S.1.2.11         | 车辆能量回收系统优化需求     | 1        |          |          |        |          |          |          |            |        |          | 1        |            |
| S.1.2.12         | 实时路况与能耗关联分析需求    | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.2.13         | 车辆维护提醒与能效关联需求    | 1        |          |          |        |          |          |          |            |        |          | 1        |            |
| S.1.2.14         | 驾驶模式选择以节能需求      | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.2.15         | 智能充电策略建议需求       | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.3 改善用户出行体验需求 |                  |          |          |          |        |          |          |          |            |        |          |          |            |
| S.1.3.1          | 交通诱导服务需求         | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.3.2          | 出行路线规划需求         | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.3.3          | 道路状况提醒需求         | 1        |          |          |        |          |          |          |            |        |          |          |            |
| S.1.3.4          | 无感支付需求           |          |          |          |        |          |          |          | 1          |        |          |          |            |
| S.1.3.5          | 自动泊车需求           | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.3.6          | 出行预约需求           | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.3.7          | 紧急呼叫提示需求         | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.3.8          | 紧急援助服务需求         | 1        |          |          |        | 1        | 1        | 1        |            |        |          |          |            |
| S.1.3.9          | 个性化出行信息推送需求      |          |          |          |        |          |          |          | 1          |        |          |          |            |
| S.1.3.10         | 实时公交/地铁到站提醒需求    | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.3.11         | 车内环境智能调节需求       | 1        |          | 1        |        |          |          |          |            |        |          |          |            |
| S.1.3.12         | 出行行程可视化需求        | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.3.13         | 多模式出行方案推荐需求      | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.3.14         | 行费用预估与比较需求       | 1        |          |          |        | 1        |          |          |            |        |          |          |            |
| S.1.3.15         | 在车状态下进行其他操作需求    |          |          |          |        |          |          |          |            |        |          |          |            |



| Legend |                            | Derive |     |     |     |     |     |     |     |     |     |     |     |     |
|--------|----------------------------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|        |                            | S01    | S02 | S03 | S04 | S05 | S06 | S07 | S08 | S09 | S10 | S11 | S12 | S13 |
| [R]    | Sdk-1.6.3 车辆位置监控需求         | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.4 车辆参数监控需求         | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.5 驾驶行为监控需求         | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.6 自动驾驶系统监控需求       | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.7 车辆异常振动监控需求       | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.8 车辆网络安全监控需求       | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.9 车辆行驶状态监控需求       | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.10 车辆软件更新监控需求      | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.11 道路环境异常监控需求      | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.12 车辆传感器信号输出需求     | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.13 车辆周围障碍物监控需求     | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.14 车辆系统稳定性监控需求     | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.15 车辆电池健康状态监控需求    | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.16 车辆紧急制动性能监控需求    | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.17 车辆辅助驾驶功能监控需求    | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.18 道路交通规则遵守监控需求    | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.19 紧急情况自动响应与记录需求   | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.20 车辆与外部设备通信监控需求   | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.21 车辆数据记录与回传监控需求   | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.22 车辆行驶环境感知监控需求    | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.6.23 自动驾驶系统健康状态监控需求  | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7 智能驾驶车辆运营监管需求       |        |     |     |     |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.1 安全运营监控需求         | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.2 运营许可证管理需求        | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.3 车辆运营路线监管需求       | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.4 车辆运营维护监管需求       | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.5 车辆运营能耗监管需求       | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.6 车辆运营范围监管需求       | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.7 车辆运营调度监管需求       | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.8 乘客服务与安全监管需求      | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.9 乘客行为监管与引导需求      | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.10 车辆运营合规性监管需求     | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.11 运营数据可视化分析需求     | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.12 运营数据记录与管理需求     | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.13 运营风险评估与预警需求     | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.14 车辆运营状态实时监控需求    | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.15 运营安全与应急响应监管需求   | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.16 运营服务评价与反馈监管需求   | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.17 自动驾驶系统运营性能评估需求  | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.18 车辆运营数据隐私保护监管需求  | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.7.19 自动驾驶功能性能验证与监管需求 | 1      | 1   | 1   | 1   |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.8 通信安全监管-车云需求        |        |     |     |     |     |     |     |     |     |     |     |     |     |
| [R]    | Sdk-1.8.1 通信监控需求           |        |     |     | 1   |     |     |     |     | 1   |     |     | 1   |     |
| [R]    | Sdk-1.8.2 车云通信认证需求         |        |     |     | 1   |     |     |     |     | 1   |     |     | 1   |     |
| [R]    | Sdk-1.8.3 通信质量监控需求         |        |     |     | 1   |     |     |     |     | 1   |     |     | 1   |     |
| [R]    | Sdk-1.8.4 车云通信故障诊断需求       |        |     |     | 1   |     |     |     |     | 1   |     |     | 1   |     |
| [R]    | Sdk-1.8.5 车云通信加密传输需求       |        |     |     | 1   |     |     |     |     | 1   |     |     | 1   |     |
| [R]    | Sdk-1.8.6 车云通信安全审计需求       |        |     |     | 1   |     |     |     |     | 1   |     |     | 1   |     |
| [R]    | Sdk-1.8.7 车云通信身份鉴别需求       |        |     |     | 1   |     |     |     |     | 1   |     |     | 1   |     |
| [R]    | Sdk-1.8.8 车云通信访问权限控制需求     |        |     |     | 1   |     |     |     |     | 1   |     |     | 1   |     |
| [R]    | Sdk-1.8.9 车云通信实时性监控需求      |        |     |     | 1   |     |     |     |     | 1   |     |     | 1   |     |
| [R]    | Sdk-1.8.10 车云通信安全管理需求      |        |     |     | 1   |     |     |     |     | 1   |     |     | 1   |     |
| [R]    | Sdk-1.8.11 车云通信异常行为检测需求    |        |     |     | 1   |     |     |     |     | 1   |     |     | 1   |     |
| [R]    | Sdk-1.8.12 车云通信故障隐私保护需求    |        |     |     | 1   |     |     |     |     | 1   |     |     | 1   |     |



| Legend |                                     | S.01     | S.02     | S.03     | S.04   | S.05     | S.06     | S.07     | S.08       | S.09   | S.10     | S.11     | S.12       | S.13      |
|--------|-------------------------------------|----------|----------|----------|--------|----------|----------|----------|------------|--------|----------|----------|------------|-----------|
| Derive |                                     | 协同感知能力需求 | 协同决策能力需求 | 远程控制能力需求 | 通信能力需求 | 信息交互能力需求 | 信息订阅能力需求 | 信息共享能力需求 | 车辆接入安全能力需求 | 地图能力需求 | 车辆定位能力需求 | 数据管理能力需求 | 自动驾驶测试能力需求 | 示范区运营能力需求 |
|        | — Sdk 1.8.13 车云通信入侵检测与防御需求          |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.8.14 车云通信应急响应与恢复需求          |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.8.15 车云通信数据完整性验证需求          |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.8.16 车辆零部件系统运行状态监控需求        |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | □ Sdk 1.9 通信安全监控-车路需求               |          |          |          |        |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.9.1 加密算法强度与更新策略监控需求         |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.9.2 访问控制与身份认证机制监控需求         |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.9.3 车路通信安全事件记录与追溯需求         |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.9.4 车路通信实时威胁监测与预警需求         |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.9.5 通信协议安全性与兼容性监控需求         |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.9.6 通信数据完整性与防篡改监控需求         |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.9.7 车路通信数据加密与密钥管理监控需求       |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.9.8 车路通信安全策略执行与合规性监控需求      |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | □ Sdk 1.10 通信安全监控-车车需求              |          |          |          |        |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.10.1 车辆身份认证与授权机制监控需求        |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.10.2 车辆间通信数据隐私保护监控需求        |          |          |          |        |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.10.3 实时通信延迟与丢包率安全监控需求       |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.10.4 消息加密与解密过程安全性监控需求       |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.10.5 车辆间通信密钥管理与更新监控需求       |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.10.6 车车通信安全事件实时监测与预警需求      |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.10.7 车辆间通信访问控制策略执行监控需求      |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.10.8 通信数据防篡改与完整性验证监控需求      |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.10.9 车辆间通信协议一致性与兼容性监控需求     |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | — Sdk 1.10.10 车辆间通信异常行为检测与响应监控需求    |          |          |          | 1      |          |          |          | 1          |        | 1        |          |            |           |
|        | □ Sdk 1.11 智能驾驶车辆行驶交通环境监控需求         |          |          |          |        |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.1 路侧设备互通需求               | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.2 设备状态远程监控需求             | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.3 行驶区域交通流监控需求            | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.4 行驶区域地区信息管理需求           | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.5 行驶区域天气状况监控需求           | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.6 行驶区域通信状态监控需求           | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.7 行驶区域道路信息监控需求           | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.8 路侧设备部署情况监控需求           | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.9 行驶区域障碍物动态监测需求          | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.10 智能驾驶车辆行驶区域停车位监控需求     | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.11 智能驾驶车辆行驶区域车速限制监控需求    | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.12 行驶区域行人与非机动车行为模式监控需求   | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.13 行驶区域路面状况（拥堵、结冰等）监控需求  | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.14 智能驾驶车辆行驶区域交通标志识别与验证需求 | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.15 行驶区域特殊事件监控需求（如施工、事故等） | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.16 智能驾驶车辆行驶区域紧急车辆优先通行监控  | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.17 智能驾驶车辆行驶区域交通拥堵状况预测与解  | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.11.18 智能驾驶车辆行驶区域环境噪声与空气质量监  | 1        | 1        | 1        | 1      |          |          |          |            |        |          |          |            |           |
|        | □ Sdk 1.12 搭建智能驾驶仿真测试环境需求           |          |          |          |        |          |          |          |            |        |          |          |            |           |
|        | — Sdk 1.12.1 测试评价需求                 |          |          |          | 1      |          |          |          |            | 1      | 1        | 1        | 1          |           |
|        | — Sdk 1.12.2 算法模型需求                 |          |          |          | 1      |          |          |          |            | 1      | 1        | 1        | 1          |           |
|        | — Sdk 1.12.3 仿真场景库需求                |          |          |          | 1      |          |          |          |            | 1      | 1        | 1        | 1          |           |
|        | — Sdk 1.12.4 仿真模型库需求                |          |          |          | 1      |          |          |          |            | 1      | 1        | 1        | 1          |           |
|        | — Sdk 1.12.5 真实场景复现需求               |          |          |          | 1      |          |          |          |            | 1      | 1        | 1        | 1          |           |
|        | — Sdk 1.12.6 仿真数据模拟器需求              |          |          |          | 1      |          |          |          |            | 1      | 1        | 1        | 1          |           |
|        | — Sdk 1.12.7 动态交通流模拟需求              |          |          |          | 1      |          |          |          |            | 1      | 1        | 1        | 1          |           |
|        | — Sdk 1.12.8 不同数据格式与兼容性需求           |          |          |          | 1      |          |          |          |            | 1      | 1        | 1        | 1          |           |
|        | — Sdk 1.12.9 模拟天气与环境条件模拟需求          |          |          |          | 1      |          |          |          |            | 1      | 1        | 1        | 1          |           |
|        | — Sdk 1.12.10 网络通信与车云交互仿真需求         |          |          |          | 1      |          |          |          |            | 1      | 1        | 1        | 1          |           |
|        | □ Sdk 1.13 全场景仿真测试环境融合应用需求          |          |          |          |        |          |          |          |            |        |          |          |            |           |

| Legend |                                   | Derive |      |      |      |      |      |      |      |      |      |      |      |      |
|--------|-----------------------------------|--------|------|------|------|------|------|------|------|------|------|------|------|------|
|        |                                   | S.01   | S.02 | S.03 | S.04 | S.05 | S.06 | S.07 | S.08 | S.09 | S.10 | S.11 | S.12 | S.13 |
|        | SRK.1.11.13 行驶区域路网状况（拥堵、结冰等）监控需求  | 1      | 1    | 1    | 1    |      |      |      |      |      |      | 1    |      |      |
|        | SRK.1.11.14 智能网联车辆行驶区域安全态势识别与验证需求 | 1      | 1    | 1    | 1    |      |      |      |      |      |      | 1    |      |      |
|        | SRK.1.11.15 行驶区域特殊事件监控需求（如施工、事故等） | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      | 1    |      |      |
|        | SRK.1.11.16 智能网联车辆行驶区域紧急车辆优先通行控制  | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      | 1    |      |      |
|        | SRK.1.11.17 智能网联车辆行驶区域交通拥堵状况预测与监控 | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      | 1    |      |      |
|        | SRK.1.11.18 智能网联车辆行驶区域环境噪声与空气质量监测 | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      | 1    |      |      |
| 白      | SRK.1.12 搭建智能网联仿真测试环境需求           |        |      |      |      |      |      |      |      |      |      |      |      |      |
|        | SRK.1.12.1 测试评价需求                 |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.2 测试模型需求                 |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.3 仿真场景库需求                |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.4 仿真模型库需求                |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.5 真实场景复刻需求               |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.6 仿真数据模拟器需求              |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.7 动态交通流模拟需求              |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.8 不同数据格式与兼容性需求           |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.9 初始天气与环境条件模拟需求          |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.10 网络通信与云云交互仿真需求         |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.11 多模态传感器数据融合仿真需求        |        |      | 1    |      |      |      |      |      | 1    | 1    |      |      |      |
|        | SRK.1.12.12 智能网联仿真测试环境行人行为模拟需求    |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.13 智能网联仿真测试环境非机动车模拟需求    |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.14 智能网联仿真测试环境高精地图模拟需求    |        |      | 1    |      |      |      |      |      | 1    |      |      |      |      |
|        | SRK.1.12.15 智能网联仿真测试环境网络安全与防护仿真需求 |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.16 智能网联仿真测试环境检测设备仿真与交互需求 |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.17 智能网联仿真测试环境交通信号控制系统模拟  |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.18 智能网联仿真测试环境特殊路况与障碍物模拟  |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
|        | SRK.1.12.19 智能网联仿真测试环境多车协同与编队行驶仿  |        |      | 1    |      |      |      |      |      | 1    | 1    | 1    |      |      |
| 白      | SRK.1.13 智能网联远程云端接管需求             |        |      |      |      |      |      |      |      |      |      |      |      |      |
|        | SRK.1.13.1 接管监控需求                 | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      |      |      |      |
|        | SRK.1.13.2 接管记录需求                 | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      |      |      |      |
|        | SRK.1.13.3 接管过程预警                 | 1      |      | 1    | 1    |      |      |      |      |      |      |      |      |      |
|        | SRK.1.13.4 远程接管需求                 | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      |      |      |      |
|        | SRK.1.13.5 接管记录与数据分析              | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      |      |      |      |
|        | SRK.1.13.6 接管权限管理与认证需求            | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      |      |      |      |
|        | SRK.1.13.7 接管操作反馈与效果评估需求          | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      |      |      |      |
|        | SRK.1.13.8 接管过程实时视频与数据传输需求        | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      |      |      |      |
|        | SRK.1.13.9 智能网联远程云端接管安全加固需求       | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      |      |      |      |
|        | SRK.1.13.10 智能网联远程云端接管系统稳定性需求     | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      |      |      |      |
|        | SRK.1.13.11 智能网联远程云端接管多场景适应性需求    | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      |      |      |      |
|        | SRK.1.13.12 智能网联远程云端接管过程可追溯性需求    | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      |      |      |      |
|        | SRK.1.13.13 智能网联远程云端接管用户界面友好性需求   | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      |      |      |      |
|        | SRK.1.13.14 远程控制需求                | 1      | 1    | 1    | 1    | 1    |      |      |      |      |      |      |      |      |
| 白      | SRK.1.14 智能网联车辆接入管理需求             |        |      |      |      |      |      |      |      |      |      |      |      |      |
|        | SRK.1.14.1 车型属性信息管理               | 1      |      | 1    | 1    |      |      |      |      | 1    |      |      |      |      |
|        | SRK.1.14.2 车辆安全信息接入               | 1      |      | 1    | 1    |      |      |      |      | 1    |      |      |      |      |
|        | SRK.1.14.3 车辆总线信息接入               | 1      |      | 1    | 1    |      |      |      |      | 1    |      |      |      |      |
|        | SRK.1.14.4 车辆轨迹信息接入               | 1      |      | 1    | 1    |      |      |      |      | 1    |      |      |      |      |
|        | SRK.1.14.5 车辆软件更新管理               | 1      |      | 1    | 1    |      |      |      |      | 1    |      |      |      |      |
|        | SRK.1.14.6 车辆传感器数据接入              | 1      |      | 1    | 1    |      |      |      |      | 1    |      |      |      |      |
|        | SRK.1.14.7 数据接安全与隐私保护             | 1      |      | 1    | 1    |      |      |      |      | 1    |      |      |      |      |
|        | SRK.1.14.8 车辆通信协议与数据格式统一          | 1      |      | 1    | 1    |      |      |      |      | 1    |      |      |      |      |
|        | SRK.1.14.9 智能网联车辆充电设施接入与管理需求      | 1      |      | 1    | 1    |      |      |      |      | 1    |      |      |      |      |
|        | SRK.1.14.10 智能网联车辆接入认证与授权管理需求     | 1      |      | 1    | 1    |      |      |      |      | 1    |      |      |      |      |
|        | SRK.1.14.11 智能网联车辆数据质量管理与校验需求     | 1      |      | 1    | 1    |      |      |      |      | 1    |      |      |      |      |
|        | SRK.1.14.12 智能网联车辆行驶路线规划与优化需求     | 1      |      | 1    | 1    |      |      |      |      | 1    |      |      |      |      |

## A.8.2.1



| Legend                               |  | Derive |  |  |  |  |  |  |  |  |  |  |  |  |
|--------------------------------------|--|--------|--|--|--|--|--|--|--|--|--|--|--|--|
|                                      |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2. 交通管控职能部门用户需求                  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1 交通监控需求                       |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1.1 监控设备工况需求                   |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1.2 交通安全监控与预防需求                |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1.3 交通拥堵预警与疏导需求                |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1.4 交通流量优化与管理需求                |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1.5 智能交通管理与服务需求                |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1.6 交通违法行为监控与处罚需求              |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1.7 路侧交通信号优化与控制需求              |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1.8 路侧交通环境控制与预警需求              |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1.9 路侧交通事件快速响应与处理需求            |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1.10 使用路侧基础设施设备与道路网络需求         |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1.11 设备应具有能源效率，以减少能源消耗和运行成本    |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1.12 需要获取路侧监控数据，用于相关交通事件分析     |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1.13 提供远程监控和维护能力，以监控设备状态和性能    |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1.14 确保监控数据的隐私和安全，以防止未经授权访问    |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.1.15 能够实时传输监控数据，如图像、视频流、车辆位置等  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.2 交通流量统计需求                     |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.2.1 交通流量数据识别需求                 |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.2.2 收集实时交通流量数据                 |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.2.3 交通流量实时动态监测需求               |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.2.4 交通流量高峰时段分析需求               |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.2.5 交通流量周期性变化识别需求              |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.2.6 交通流量数据可视化分析需求              |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.2.7 交通流量突发事件影响评估需求             |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.2.8 多模式交通流量统计与对比需求             |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.2.9 交通流量与交通行为关联分析需求            |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.2.10 交通流量与交通设施关系分析需求           |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.2.11 通过交通流量给出调整控制策略需求          |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.2.12 交通流量数据质量控制与错误纠正需求         |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.2.13 存储和维护历史交通流量数据，以支持长期趋势分析   |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.2.14 需求统计不同区域内的交通流量需求，可用于城市规划  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.3 交通信息发布需求                     |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.3.1 个性化交通信息发布需求                |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.3.2 交通管制与限行信息发布需求              |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.3.3 动态交通信息发布与更新需求              |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.3.4 实时路况视频直播与回放需求              |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.3.5 跨平台与多终端交通信息发布需求            |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.3.6 交通紧急事件应对指南信息发布需求           |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.3.7 提供天气预报和道路状况信息，包括雨雪、雾、霾等    |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.3.8 可通过路侧设备向自动驾驶车辆提供交通事件、施工信息等 |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.3.9 提高道路维护和施工信息，包括施工地点、计划时间等   |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.3.10 提供给交通管理部门、维护和应急中心提供交通事件   |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.3.11 提供实时交通状态信息，包括交通拥堵、事故、施工等  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.3.12 提供公共交通信息，包括公共汽车、地铁和公共自行车等 |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.4 区域交通管理需求                     |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.4.1 区域交通信号协调控制需求               |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.4.2 区域交通拥堵管理需求                 |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.4.3 区域公共交通优化调度需求               |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.4.4 管理区域内交通和事件数据               |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.4.5 区域交通拥堵识别与预警需求              |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.4.6 区域交通数据共享与开放需求              |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.4.7 区域交通规则与决策支持需求              |  |        |  |  |  |  |  |  |  |  |  |  |  |  |
| Ssk 2.4.8 区域应急响应与救援指挥需求              |  |        |  |  |  |  |  |  |  |  |  |  |  |  |

| Legend                           |  | 5.01     | 5.02     | 5.03     | 5.04   | 5.05     | 5.06     | 5.07     | 5.08       | 5.09   | 5.10     | 5.11     | 5.12     | 5.13   |
|----------------------------------|--|----------|----------|----------|--------|----------|----------|----------|------------|--------|----------|----------|----------|--------|
| Derive                           |  | 相同感知能力需求 | 相同感知能力需求 | 相同感知能力需求 | 通信能力需求 | 信息发布能力需求 | 信息识别能力需求 | 信息交互能力需求 | 车辆接入安全能力需求 | 地图能力需求 | 车辆定位能力需求 | 数据管理能力需求 | 自动驾驶能力需求 | 示警能力需求 |
| 5.2.4.9 区域交通动态平衡与优化需求            |  | 1        |          |          |        | 1        | 1        | 1        |            |        |          | 1        |          |        |
| 5.2.4.10 区域交通安全风险评估与防控需求         |  | 1        |          |          |        |          | 1        | 1        |            |        |          | 1        |          |        |
| 5.2.4.11 区域交通参与者行为分析与引导需求        |  |          |          |          |        |          | 1        | 1        |            |        |          | 1        |          |        |
| 5.2.4.12 需与其他交通管理中心交换交通事件数据      |  | 1        |          |          |        |          | 1        | 1        |            |        |          | 1        |          |        |
| 5.2.5 交通事故管理需求                   |  |          |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.5.1 交通事故自动分类                 |  |          |          |          |        |          | 1        | 1        |            |        |          | 1        |          |        |
| 5.2.5.2 交通事故预警需求                 |  |          |          |          |        |          | 1        | 1        |            |        |          | 1        |          |        |
| 5.2.5.3 交通事故原因分析需求               |  |          |          |          |        |          | 1        | 1        |            |        |          | 1        |          |        |
| 5.2.5.4 交通事故数据上报需求               |  |          |          |          |        |          | 1        | 1        |            |        |          | 1        |          |        |
| 5.2.5.5 交通事故数据统计分析需求             |  |          |          |          |        |          | 1        | 1        |            |        |          | 1        |          |        |
| 5.2.5.6 交通事故伤员数据查询与对比需求          |  |          |          |          |        |          | 1        | 1        |            |        |          | 1        |          |        |
| 5.2.5.7 交通事故现场快速调查与记录需求          |  |          |          |          |        |          | 1        | 1        |            |        |          | 1        |          |        |
| 5.2.5.8 交通事故责任调查与判定支持需求          |  |          |          |          |        |          | 1        | 1        |            |        |          | 1        |          |        |
| 5.2.5.9 与应急系统对接, 协调资源需求需求        |  |          |          |          |        |          | 1        | 1        |            |        |          | 1        |          |        |
| 5.2.5.10 交通事故影响评估与恢复计划制定需求       |  |          |          |          |        |          | 1        |          |            |        |          | 1        |          |        |
| 5.2.5.11 交通事故现场周边数据需求的相关数据需求     |  |          |          |          |        |          | 1        | 1        |            |        |          | 1        |          |        |
| 5.2.5.12 与其它交通管理系统对接保证事件信息共享, 以  |  |          |          |          |        |          | 1        | 1        |            |        |          | 1        |          |        |
| 5.2.6 运营决策支持需求                   |  |          |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.6.1 预测道路和交通状况需求              |  |          |          |          |        |          | 1        |          |            |        |          |          |          |        |
| 5.2.6.2 监测并预测交通事故发生趋势            |  | 1        |          |          |        |          |          |          |            |        |          | 1        |          |        |
| 5.2.6.3 交通流模拟与预测优化方案需求           |  | 1        |          |          |        |          |          |          |            |        |          | 1        |          |        |
| 5.2.6.4 交通系统韧性评估与提升建议需求          |  | 1        |          |          |        |          |          |          |            |        |          | 1        |          |        |
| 5.2.6.5 交通参与者行为模式分析与引导策略需求       |  | 1        |          |          |        |          |          |          |            |        |          | 1        |          |        |
| 5.2.6.6 分析交通流量数据, 识别高峰时段与热点区域需求  |  | 1        |          |          |        |          |          |          |            |        |          | 1        |          |        |
| 5.2.6.7 实施交通(建设)管理策略, 以纠正路网拥堵需求  |  |          |          |          |        |          | 1        | 1        |            |        |          |          |          |        |
| 5.2.6.8 通过预测道路和交通状况来给出交通管理建议需求   |  |          |          |          |        |          | 1        |          |            |        |          |          |          |        |
| 5.2.6.9 分析特殊事件(如大型活动、恶劣天气)对交通需求  |  | 1        |          |          |        |          |          |          |            |        |          | 1        |          |        |
| 5.2.6.10 收集主干道、高速公路和交通系统的多源实时数   |  | 1        |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.7 违章管理需求                     |  |          |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.7.1 监控非停车区是否停车需求             |  | 1        |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.7.2 监控路口车辆是否按信号灯行驶需求         |  | 1        |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.7.3 监控车辆是否违规占用应急车道需求         |  | 1        |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.7.4 识别违章高发车型与驾驶员群体需求         |  | 1        |          |          |        |          |          |          |            |        |          | 1        |          |        |
| 5.2.7.5 监控车辆是否违规变道或压线行驶需求        |  | 1        |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.7.6 分析违章数据, 识别高风险地点与时间段      |  | 1        |          |          |        |          |          |          |            |        |          | 1        |          |        |
| 5.2.7.7 实时监控并记录车辆违规停车上下客行为需求     |  | 1        |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.7.8 监控行人及非机动车闯红灯、违规穿越马路行为需求  |  | 1        |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.7.9 监控车辆是否超限行驶(如超载、超占、超重)需求  |  | 1        |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.7.10 监控车辆行驶速度, 监控车辆是否按正常车道行驶 |  | 1        |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.7.11 实时检测并记录车辆逆行, 违规掉头等危险驾驶  |  | 1        |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.7.12 与其它交通管理部门系统对接, 上报违章信息,  |  | 1        |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.8 交通事故预警需求                   |  |          |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.8.1 实时交通事件信息获取需求             |  | 1        |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.8.2 交通事件信息下发给车辆需求            |  | 1        |          |          | 1      |          |          |          |            |        |          |          |          |        |
| 5.2.8.3 预测并预警交通流量激增事件需求          |  | 1        | 1        |          |        | 1        |          |          |            |        |          |          |          |        |
| 5.2.8.4 实时监控并预警交通事故风险区域需求        |  | 1        | 1        |          |        | 1        |          |          |            |        |          |          |          |        |
| 5.2.8.5 实时监控并预警车辆故障隐患风险需求        |  | 1        | 1        |          |        | 1        |          |          |            |        |          |          |          |        |
| 5.2.8.6 预测并预警潜在的大规模交通拥堵事件需求      |  | 1        | 1        |          |        | 1        |          |          |            |        |          |          |          |        |
| 5.2.8.7 交通和道路状况及事件信息对驾驶员进行提醒需求   |  | 1        | 1        |          |        | 1        |          |          |            |        |          |          |          |        |
| 5.2.8.8 特殊天气(如大雪、暴雨)对交通影响的预警需求   |  | 1        | 1        |          |        | 1        |          |          |            |        |          |          |          |        |
| 5.2.8.9 特殊事件(如大型演唱会、体育赛事)对周边交通   |  | 1        | 1        |          |        | 1        |          |          |            |        |          |          |          |        |
| 5.2.9 交通信号管理需求                   |  |          |          |          |        |          |          |          |            |        |          |          |          |        |
| 5.2.9.1 协调交通信号                   |  | 1        |          | 1        |        |          |          |          |            |        |          |          |          |        |
| 5.2.9.2 优化交通信号控制                 |  | 1        |          | 1        |        |          |          |          |            |        |          |          |          |        |





| Legend                         |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|--------------------------------|--|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| Derive                         |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3 智能网联先导区/示范区              |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.1 云控基础平台可接入性需求           |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.1.1 建设云控基础平台接入接口需求       |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.1.2 可接入云控应用需求            |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.1.3 智能基础设施数据接入需求         |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.1.4 车联网行业网络信息交换基础需求      |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.1.5 建设云控应用支持多业务场景需求      |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.1.6 5G及LTE-V2X 通信网建设需求   |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.1.7 高精度地图与高精度定位融合的地理信息需求 |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2 车路云数据管理需求              |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.1 车路云数据共享需求            |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.2 车路云数据分发需求            |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.3 车路云数据存储需求            |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.4 车路云数据采集需求            |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.5 车路云数据传输安全需求          |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.6 车路云数据分类管理需求          |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.7 车路云数据加工处理需求          |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.8 车路云数据可视化分析需求         |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.9 车路云数据访问控制需求          |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.10 车路云数据质量管理需求         |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.11 车路云数据隐私保护需求         |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.12 车路云数据可视化展示需求        |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.13 车路云数据可视化监控需求        |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.14 车路云数据备份与恢复需求        |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.15 车路云数据实时性监控需求        |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.16 车路云数据跨域互操作需求        |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.17 车路云数据集成与整合需求        |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.2.18 车路云数据质量控制与校验需求      |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3 自动驾驶车辆测试需求             |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.1 测试场地管理需求             |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.2 测试数据回放需求             |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.3 测试结果评审需求             |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.4 测试计划管理需求             |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.5 测试过程监管需求             |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.6 建立测试所需场景库需求          |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.7 测试报告和记录管理需求          |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.8 测试数据统计及分析需求          |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.9 车云场景实际道路测试需求         |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.10 自动驾驶测试全流程管理需求       |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.11 自动驾驶测试数据质量评估需求      |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.12 自动驾驶测试模拟环境搭建需求      |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.13 自动驾驶测试车辆性能评估需求      |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.14 自动驾驶测试实时监控与预警需求     |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.15 自动驾驶测试数据可视化展示需求     |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.16 自动驾驶测试数据安全与合规性审查需求  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.17 对测试运营相关的过程进行管理的需求   |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.3.18 自动驾驶测试中的车路协同性能评估需求  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.4 车辆运营需求                 |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.4.1 出租车运营需求              |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.4.2 网约车运营需求              |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.4.3 租赁车运营需求              |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.4.4 清扫车运营需求              |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.4.5 渣土车运营需求              |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.4.6 观光车运营需求              |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.4.7 环卫车运营需求              |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.4.8 环卫车运营需求              |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.4.9 环卫车运营需求              |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |
| S0k.3.4.10 环卫车运营需求             |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |





| Legend                           |  |               |               |               |             |               |               |               |                 |             |               |               |                 |                |
|----------------------------------|--|---------------|---------------|---------------|-------------|---------------|---------------|---------------|-----------------|-------------|---------------|---------------|-----------------|----------------|
| Dorvo                            |  |               |               |               |             |               |               |               |                 |             |               |               |                 |                |
|                                  |  | 5.01 协同感知能力需求 | 5.02 协同决策能力需求 | 5.03 协同控制能力需求 | 5.04 通信能力需求 | 5.05 信息发布能力需求 | 5.06 信息订阅能力需求 | 5.07 分拨共享能力需求 | 5.08 车辆接入安全能力需求 | 5.09 地图能力需求 | 5.10 车辆定位能力需求 | 5.11 数据管理能力需求 | 5.12 自动驾驶测试能力需求 | 5.13 示范区运营能力需求 |
| — 5.3.3.7 边缘计算节点运行状态监管需求         |  | 1             |               |               |             |               |               |               |                 |             | 1             |               |                 |                |
| 5.3.3.7 智能网联场景管理需求               |  |               |               |               |             |               |               |               |                 |             |               |               |                 |                |
| — 5.3.3.7.1 场景下发需求               |  |               | 1             | 1             |             |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.3.7.2 场景展示需求               |  | 1             | 1             | 1             |             |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.3.7.3 场景测试需求               |  | 1             | 1             | 1             |             |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.3.7.4 场景安全评估需求             |  | 1             | 1             | 1             |             |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.3.7.5 场景运行监控需求             |  | 1             | 1             | 1             |             |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.3.7.6 场景风险评估需求             |  | 1             | 1             | 1             |             |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.3.7.7 场景数据收集与分析需求          |  | 1             | 1             | 1             |             |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.3.7.8 场景模拟与仿真验证需求          |  | 1             | 1             | 1             |             |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.3.7.9 场景资源调度与更新需求          |  | 1             | 1             | 1             |             |               |               |               |                 |             | 1             | 1             |                 |                |
| 5.3.8 交通优化与管理需求                  |  |               |               |               |             |               |               |               |                 |             |               |               |                 |                |
| — 5.3.8.1 车路共享需求                 |  | 1             | 1             |               | 1           | 1             |               |               |                 |             | 1             |               |                 |                |
| — 5.3.8.2 道路监管需求                 |  | 1             |               |               |             |               |               |               |                 |             | 1             |               |                 |                |
| — 5.3.8.3 公交车道共享需求               |  | 1             | 1             |               | 1           | 1             |               |               |                 |             | 1             |               |                 |                |
| — 5.3.8.4 应急交通管理需求               |  | 1             | 1             |               | 1           | 1             |               |               |                 |             | 1             |               |                 |                |
| — 5.3.8.5 实时交通态势监控需求             |  | 1             |               |               |             |               |               |               |                 |             | 1             |               |                 |                |
| — 5.3.8.6 公共交通优先通行管理需求           |  | 1             | 1             |               | 1           | 1             |               |               |                 |             | 1             |               |                 |                |
| — 5.3.8.7 动态路径规划与导航优化需求          |  | 1             | 1             |               | 1           |               |               |               |                 |             |               |               |                 |                |
| — 5.3.8.8 车路协同下的交通流调控需求          |  | 1             | 1             |               | 1           |               |               |               |                 |             |               |               |                 |                |
| — 5.3.8.9 交通基础设施智能巡检与维护需求        |  | 1             | 1             |               | 1           | 1             |               |               |                 |             | 1             |               |                 |                |
| — 5.3.8.10 非机动车与行人交通安全管理需求       |  | 1             | 1             |               | 1           | 1             |               |               |                 |             | 1             |               |                 |                |
| — 5.3.8.11 智能网联车辆优先通行与调度策略需求     |  | 1             | 1             |               | 1           |               |               |               |                 |             |               |               |                 |                |
| 5.3.9 个人出行优化需求                   |  |               |               |               |             |               |               |               |                 |             |               |               |                 |                |
| — 5.3.9.1 信息提醒需求                 |  |               |               |               | 1           | 1             |               |               |                 |             | 1             |               |                 |                |
| — 5.3.9.2 服务订阅需求                 |  |               |               |               | 1           | 1             |               |               |                 |             | 1             |               |                 |                |
| — 5.3.9.3 车辆预约需求                 |  |               |               |               | 1           | 1             |               |               |                 |             | 1             |               |                 |                |
| — 5.3.9.4 出行路线规划需求               |  |               |               |               | 1           | 1             |               |               |                 |             | 1             |               |                 |                |
| — 5.3.9.5 支付与结算优化需求              |  |               |               |               | 1           | 1             |               |               |                 |             | 1             |               |                 |                |
| — 5.3.9.6 停车预约与导航一体化服务需求         |  | 1             | 1             | 1             | 1           |               |               |               |                 |             | 1             |               |                 |                |
| — 5.3.9.7 多模式交通无缝换乘方案推荐需求        |  | 1             | 1             | 1             | 1           |               |               |               |                 |             | 1             |               |                 |                |
| — 5.3.9.8 紧急临时服务需求               |  |               |               |               | 1           | 1             |               |               |                 |             | 1             |               |                 |                |
| 5.3.10 云控系统测试需求                  |  |               |               |               |             |               |               |               |                 |             |               |               |                 |                |
| — 5.3.10.1 网关接入测试需求              |  |               |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.10.2 协同决策系统测试需求            |  |               |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.10.3 数据分级共享测试需求            |  |               |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.10.4 数据管理系统测试需求            |  |               |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.10.5 云控系统可扩展性测试需求          |  |               |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.10.6 云控系统安全性能测试需求          |  |               |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.10.7 多源异构感知融合测试需求          |  |               |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.10.8 云控系统实时性与响应速度测试需求      |  |               |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.10.9 车云、路云、云云互联互通测试需求      |  |               |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.10.10 云控系统故障检测与容灾能力测试需求    |  |               |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| 5.3.11 感知设备感知能力测试需求              |  |               |               |               |             |               |               |               |                 |             |               |               |                 |                |
| — 5.3.11.1 基础性能测试需求              |  | 1             |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.11.2 环境适应性测试需求             |  | 1             |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.11.3 交通感知性能测试需求            |  | 1             |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.11.4 障碍物检测性能测试需求           |  | 1             |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.11.5 交通事件感知性能测试需求          |  | 1             |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.11.6 交通参与感知性能测试需求          |  | 1             |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.11.7 数据存储和传输性能测试需求         |  | 1             |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.11.8 多传感器融合感知性能测试需求        |  | 1             |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.11.9 夜间及低光照条件下感知性能测试需求     |  | 1             |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |
| — 5.3.11.10 复杂天气条件（如雨雾雪）感知性能测试需求 |  | 1             |               |               | 1           |               |               |               |                 |             | 1             | 1             |                 |                |

A.8.2.3

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6.2 B

B.1

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8.18.2.4.28.2.4.38.2.4.48.48.58.68.78.8

“B.5”

JSON

8.28.4

9.19.29.39.4B.3

B.4

B.6

B.2

B.2.1

| B.2.1.1 |            |         |                         |
|---------|------------|---------|-------------------------|
|         | vehicleId  | String  | 8 /                     |
|         | uuid       | String  | 36 UTF-8                |
|         | timestamp  | Long    | ms UTC                  |
|         | grouteType | Integer | [0..255] 0 1 ;2- 20 255 |

|  |              |                  |                                 |
|--|--------------|------------------|---------------------------------|
|  |              |                  |                                 |
|  | pathPointNum | Integer          | [0..100000]                     |
|  | pathPoints   | List<Position2D> | B.2.1.2 Position2D              |
|  | destHeading  | Double           | [0..360.0000] 1 °<br>0xFFFFFFFF |

#### B.2.1.2 Position2D

|  |           |        |                                 |
|--|-----------|--------|---------------------------------|
|  |           |        |                                 |
|  | longitude | Double | -180<br>0000000~180.0000000 ° 7 |
|  | latitude  | Double | -<br>90.0000000~90.000000 ° 7   |

#### B.2.1.3 Position3D

|  |           |         |                                 |
|--|-----------|---------|---------------------------------|
|  |           |         |                                 |
|  | longitude | Double  | -180<br>0000000~180.0000000 ° 7 |
|  | latitude  | Double  | -<br>90.0000000~90.000000 ° 7   |
|  | elevation | Integer | -5000~65000<br>dm               |

### B.3

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## B.3.1

### B.3.1.1 <sup>7</sup>

|       |                |     |              |
|-------|----------------|-----|--------------|
|       |                |     |              |
|       | PRS            |     |              |
|       | PRS_Sea        |     |              |
|       | PRS_Max        |     |              |
|       | PRS_Min        |     |              |
| /     | TEM            | ( ) |              |
|       | TEM_Max        | ( ) |              |
|       | TEM_Min        | ( ) |              |
|       | RHU            |     |              |
|       | RHU_Min        |     |              |
|       | VAP            |     |              |
|       | PRE_1h         |     |              |
| ( )   | WIN_D_INST_Max |     |              |
|       | WIN_S_Max      | /   |              |
| ( )   | WIN_D_S_Max    |     |              |
| 2     | WIN_S_Avg_2mi  | /   |              |
| 2 ( ) | WIN_D_Avg_2mi  |     |              |
|       | WEP_Now        | -   | <sup>8</sup> |
|       | WIN_S_Inst_Max | /   |              |
|       | tigan          | ( ) |              |
|       | windpower      |     |              |
| ( )   | VIS            |     |              |
|       | CLO_Cov        |     |              |
|       | CLO_Cov_Low    |     |              |
| ( )   | CLO_COV_LM     |     |              |

<sup>7</sup> “ ( )  
<https://data.cma.cn/> ” — “ > API > ”  
<sup>8</sup> “ ( )  
<https://data.cma.cn/> — “ ”

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## B.4

### B.4.1

#### B.4.1.1

|  |             |                          |                      |
|--|-------------|--------------------------|----------------------|
|  |             |                          |                      |
|  | valid       | Integer                  | 0 1 255              |
|  | pos         | Position3D               |                      |
|  | type        | Integer                  | 1: 2: 3: 255: :      |
|  | lenCnstrctn | Double                   | m 1                  |
|  | numOfLane   | Integer                  | 255                  |
|  | laneInfo    | Array of<br>cnstrctnLane | B.4.1.2 cnstrctnLane |
|  | startTime   | Long                     | UTC                  |
|  | endTime     | Long                     | UTC                  |

#### B.4.1.2 cnstrctnLane

|  |            |                        |                    |
|--|------------|------------------------|--------------------|
|  |            |                        |                    |
|  | laneSeq    | Integer                | 1 255              |
|  | width      | Double                 | m 1 255            |
|  | numPoint   | Integer                |                    |
|  | pathPoints | Array of<br>Position3D | B.2.1.3 Position3D |

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## B.4.2

### B.4.2.1

|  |             |                          |                      |
|--|-------------|--------------------------|----------------------|
|  |             |                          |                      |
|  | valid       | Integer                  | 0 1 255              |
|  | pos         | Position3D               | B.2.1.3 Position3D   |
|  | depth       | Double                   | cm                   |
|  | lenCnstrctn | Double                   | m 1                  |
|  | numOfLane   | Integer                  | 255                  |
|  | laneInfo    | Array of<br>cnstrctnLane | B.4.1.2 cnstrctnLane |
|  | startTime   | Long                     | UTC                  |
|  | endTime     | Long                     | UTC                  |

## B.4.3

### B.4.3.1

|  |            |            |                    |
|--|------------|------------|--------------------|
|  |            |            |                    |
|  | valid      | Integer    | 0 1 255            |
|  | pos        | Position3D | B.2.1.3 Position3D |
|  | type       | Integer    | 0 1 2 3<br>255     |
|  | velocity   | Double     | 2 mps              |
|  | heading    | Double     | 4 deg              |
|  | RsiLaneSeq | Integer    | 1<br>255           |



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## B.4.4

### B.4.4.1

|     |           |                     |                            |
|-----|-----------|---------------------|----------------------------|
|     |           |                     |                            |
|     | msgType   | String              | "rsi"                      |
| RSU | rsuId     | String              | A                          |
|     | msgCnt    | Integer             | [0..127] 0 127             |
|     | timestamp | Long                | UUID ms                    |
|     | rteNum    | Integer             | [0..8] RSI                 |
|     | rtsNum    | Integer             | [0..16] RSI                |
|     | rteList   | Array of<br>RTS/ETE | B.4.4.2<br>rteList/rtsList |
|     | rtsList   | Array of<br>RTS/RTE | B.4.4.3<br>rteList/rtsList |

#### B.4.4.2 rteList/rtsList

|     |                |                            |                                                                                                                                                      |
|-----|----------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | uuid           | String                     |                                                                                                                                                      |
| rsi | rsiType        | Integer                    | RSI RTS rsiType<br>YD/T 3709 signType GB<br>5768.2—2022<br>B<br>RSI RTE rsiType<br>YD/T 3709 eventType<br>GB/T 29100<br>B.2                          |
|     | eventSource    | Integer                    | [0..5] 0 Unknown 1 traffic<br>police 2 government 3<br>meteorological department 4<br>internet services 5 local<br>detection<br>RSI RTE<br>eventType |
|     | eventRadius    | Integer                    | [0..65535] 0.1 m                                                                                                                                     |
|     | referenceLinks | Array of<br>referenceLinks | [1..16]<br>B.4.4.3 referenceLinks                                                                                                                    |
|     | timestamp      | Long                       | UUID<br>ms                                                                                                                                           |
|     | content        | String                     |                                                                                                                                                      |
|     | priority       | Integer                    | [0..7]<br>0                                                                                                                                          |
|     | pathRadius     | Integer                    | [0..1024]<br>pathPoint alertRadius<br>RSI<br>pathPoint<br>alertRadius                                                                                |
| /   | longitude      | Double                     | [-180..180]<br>7                                                                                                                                     |
| /   | latitude       | Double                     | [-90..90]<br>7                                                                                                                                       |
| /   | elevation      | Double                     | m 1                                                                                                                                                  |
|     | status         | Integer                    | 0 1                                                                                                                                                  |
|     | strategy       | Array of<br>Strategy       | B.4.4.4<br>Strategy                                                                                                                                  |

#### B.4.4.3 referenceLinks

|    |                  |                  |                                                                                                                                                                                                                                           |
|----|------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                  |                  |                                                                                                                                                                                                                                           |
| id | upstreamNodeId   | Integer          | referenceLink                                                                                                                                                                                                                             |
| id | downstreamNodeId | Integer          | referenceLink                                                                                                                                                                                                                             |
|    | referenceLanes   | Array of Integer | <p>[0..15]      0 reserved 1 lane1<br/> 2 lane2 3 lane3 4 lane4 5 lane5<br/> 6 lane6 7 lane7 8 lane8 9 lane9<br/> 10 lane10 11 lane11 12 lane12 13<br/> lane13 14 lane14 15 lane15</p> <p>lane1,3,5.</p> <p>"referenceLanes": [1,3,5]</p> |

#### B.4.4.4 Strategy

|  |           |         |                          |
|--|-----------|---------|--------------------------|
|  |           |         |                          |
|  | type      | Integer | <p>0      1</p> <p>2</p> |
|  | beginTime | Long    | —                        |
|  | endTime   | Long    | —                        |
|  | interval  | Integer | ms [50..50000] 50        |

### B.4.5

#### B.4.5.1

|  |               |            |                    |
|--|---------------|------------|--------------------|
|  |               |            |                    |
|  | valid         | Integer    | 0      1      255  |
|  | pos           | Position3D | B.2.1.3 Position3D |
|  | visibilityDis | Double     | 1      m           |

### B.4.6

#### B.4.6.1

|    |             |            |         |
|----|-------------|------------|---------|
|    |             |            |         |
| ID | parkId      | String     |         |
|    | parkName    | String     |         |
|    | totalNum    | Integer    |         |
|    | freeNum     | Integer    |         |
|    | carSlotList | JSONObject | B.4.6.2 |

#### B.4.6.2

|    |             |         |      |
|----|-------------|---------|------|
|    |             |         |      |
| ID | id          | String  | ID   |
|    | slotName    | String  |      |
|    | areaName    | String  |      |
|    | floor       | String  |      |
| ID | areaId      | String  | ID   |
|    | carType     | String  |      |
|    | limitLen    | Integer | 0 mm |
|    | limitWidth  | Integer | 0 mm |
|    | limitHeight | Integer | 0 mm |
|    | freeState   | Integer | 0 1  |

### B.4.7

#### B.4.7.1

|    |             |         |         |
|----|-------------|---------|---------|
|    |             |         |         |
| ID | uuid        | String  | ID      |
|    | valid       | Integer | 0 1 255 |
|    | len         | Double  | 1 m 255 |
|    | wid         | Double  | 1 m 255 |
|    | hei         | Double  | 1 m 255 |
|    | laneOfEvent | Array   | id 1    |
|    | laneId      | Integer |         |
|    | distance    | Double  | 1 m     |

---

## B.5

1

2

### B.5.1

8.8.9.3.1      64      65  
CLOUD2VEH\_ASTFUNC\_TLM

### B.5.2

8.5.6.3.1      25      26  
CLOUD2VEH\_ADVICE\_GLOSA

#### B.5.2.1

| ID | vehicleId       | String  | 8                             |
|----|-----------------|---------|-------------------------------|
|    | valid           | Integer | 0      1      255             |
|    | type            | Integer | 0      1      2      3        |
|    | d2StopLine      | Double  | -1<br>1      m                |
|    | numAdvSpd       | Integer | 0~255   0<br>255              |
|    | advSpd          | Array   |                               |
|    | spdMax          | Double  | 2      mps                    |
|    | spdMin          | Double  | 2      mps                    |
|    | spdExp          | Double  | 2      mps                    |
|    | maneuver        | Integer | 0      1<br>3      4      255 |
|    | numIntersection | Integer | 0-255   0<br>1      2         |

|  |  |  |     |
|--|--|--|-----|
|  |  |  |     |
|  |  |  | 255 |

### B.5.3

8.5.14.3.1 42 43 44  
CLOUD2VEH\_ADVICE\_COM\_RSI

#### B.5.3.1

|    |             |         |                    |
|----|-------------|---------|--------------------|
|    |             |         |                    |
| ID | vehicleId   | String  | 8                  |
|    | valid       | Integer | 0 1 255            |
|    | d2StopLine  | Double  | -1<br>1 m          |
|    | numPhase    | Integer | 0-255 0 255        |
|    | spatWarning | Array   |                    |
| ID | phaseId     | Integer | ID                 |
|    | warningType | Integer | 0-255 0 1<br>2 255 |

### B.5.4

8.5.14.3.1 42 43 44  
CLOUD2VEH\_ADVICE\_COM\_RSI

#### B.5.4.1

|    |               |         |                        |
|----|---------------|---------|------------------------|
|    |               |         |                        |
| ID | vehicleId     | String  | 8                      |
|    | valid         | Integer | 0 1 255                |
|    | tagLaneSeq    | Integer | 0-255 0 1<br>255       |
|    | curLaneSeq    | Integer | 0-255 0 1<br>255       |
|    | directionType | Integer | 0-255 0 1 2<br>3 4 255 |
|    | laneChgType   | Integer | 0-255 0 1 2<br>3 255   |

## B.5.5

8.5.14.3.1 42 43 44  
CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.5.1

|    |                      |         |          |
|----|----------------------|---------|----------|
|    |                      |         |          |
| ID | vehicleId            | String  | 8        |
|    | valid                | Integer | 0 1 255  |
|    | linkAvgSpeed         | Array   |          |
| id | upstreamNode<br>Id   | Integer | id       |
| id | downStreamNo<br>deId | Integer | id       |
|    | avgSpeed             | Double  | ,2 mps   |
|    | laneNum              | Integer |          |
| 1  | VALane1              | Double  | 1 ,2 mps |
| 2  | VALane2              | Double  | 2 ,2 mps |
|    | vdis2start           | Double  | m        |
|    | RsiLaneId            | Integer | 1<br>255 |

## B.5.6

8.5.14.3.1 42 43 44  
CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.6.1

|           |              |         |                |
|-----------|--------------|---------|----------------|
|           |              |         |                |
| ID        | vehicleId    | String  | 8              |
|           | valid        | Integer | 0 1 255        |
| vehicleId | RV_vehicleId | String  | 8 vehicleId    |
|           | type         | Integer | 0 1 2<br>3 255 |
|           | velocity     | Double  | 2 mps          |
|           | heading      | Double  | 4 deg          |

|  |            |         |              |
|--|------------|---------|--------------|
|  |            |         |              |
|  |            |         |              |
|  | RsiLaneSeq | Integer | 1<br>255     |
|  | distance   | Double  | 1<br>m 65535 |

## B.5.7

8.7.4.1 53 54 44  
CLOUD2VEH\_REMOTECTL

### B.5.7.1

|    |           |         |         |
|----|-----------|---------|---------|
|    |           |         |         |
| ID | vehicleId | String  | 8       |
|    | valid     | Integer | 0 1 255 |

## B.5.8

8.8.14.3.1 42 43 44  
CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.8.1

|    |           |         |         |
|----|-----------|---------|---------|
|    |           |         |         |
| ID | vehicleId | String  | 8       |
|    | valid     | Integer | 0 1 255 |
|    | d2Point   | Double  | 1 m     |

## B.5.9

8.5.14.3.1 42 43 44  
CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.9.1

|    |           |         |         |
|----|-----------|---------|---------|
|    |           |         |         |
| ID | vehicleId | String  | 8       |
|    | valid     | Integer | 0 1 255 |



|  |             |         |      |
|--|-------------|---------|------|
|  |             |         |      |
|  | alertType   | Integer |      |
|  | laneOfEvent | Array   | id 1 |
|  | d2Event     | Double  | m    |
|  | startTime   | Long    |      |
|  | endTime     | Long    |      |

## B.5.10

8.5.14.3.1 42 43 44  
CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.10.1

|    |                  |         |           |
|----|------------------|---------|-----------|
|    |                  |         |           |
| ID | vehicleId        | String  | 8         |
|    | valid            | Integer | 0 1 255   |
|    | linkSpeedLimit   | Array   |           |
| id | upstreamNodeId   | Integer | id        |
| id | downStreamNodeId | Integer | id        |
|    | speedLimit       | Double  | , 2 mps   |
|    | laneNum          | Integer |           |
| 1  | SLLane1          | Double  | 1 , 2 mps |
| 2  | SLLane1          | Double  | 2 , 2 mps |

## B.5.11

8.5.14.3.1 42 43 44  
CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.11.1

|    |           |         |                 |
|----|-----------|---------|-----------------|
|    |           |         |                 |
| ID | vehicleId | String  | 8               |
|    | valid     | Integer | 0 1 255         |
|    | type      | Integer | 0: 1: 2: 255: : |
|    | velocity  | Double  | 2 mps           |
|    | heading   | Double  | 4 deg           |

|  |          |        |    |
|--|----------|--------|----|
|  |          |        |    |
|  | distance | Double | dm |

## B.5.12

8.5.14.3.1 42 43 44  
CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.12.1

|    |             |         |                    |
|----|-------------|---------|--------------------|
|    |             |         |                    |
| ID | vehicleId   | String  | 8                  |
|    | valid       | Integer | 0 1 255            |
|    | d2StopLine  | Double  | -1<br>1 m          |
|    | numPhase    | Integer | 0-255 0 255        |
|    | spatWarning | Array   |                    |
| ID | phaseId     | Integer | ID                 |
|    | warningType | Integer | 0-255 0 1<br>2 255 |

## B.5.13

8.5.14.3.1 42 43 44  
CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.13.1

|    |             |         |         |
|----|-------------|---------|---------|
|    |             |         |         |
| ID | vehicleId   | String  | 8       |
|    | valid       | Integer | 0 1 255 |
|    | len         | Double  | 1 m     |
|    | wid         | Double  | 1 m     |
|    | hei         | Double  | 1 m     |
|    | laneOfEvent | Array   | id 1    |
|    | laneId      | Integer |         |
|    | distance    | Double  | 1 m     |

---

## B.5.14

8.5.14.3.1    42       43       44  
CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.14.1

|    |               |            |                     |
|----|---------------|------------|---------------------|
|    |               |            |                     |
| ID | vehicleId     | String     | 8                   |
|    | valid         | Integer    | 0       1       255 |
|    | pos           | Position3D | 2.3 Position3D      |
|    | visibilityDis | Double     | 1       m           |

## B.5.15

8.5.14.3.1    42       43       44  
CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.15.1

|  |           |         |                        |
|--|-----------|---------|------------------------|
|  |           |         |                        |
|  | vehicleId | String  |                        |
|  | valid     | Integer | 0       1       255    |
|  | velocity  | Double  | 2       mps            |
|  | heading   | Double  | 4       deg            |
|  | RsiLaneId | Integer | 0-255 0       1<br>255 |
|  | distance  | Double  | 1       m              |
|  | objId     | String  | uuid                   |

---

## B.5.16

8.5.14.3.1 42 43 44  
CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.16.1

|    |           |         |           |
|----|-----------|---------|-----------|
|    |           |         |           |
| ID | vehicleId | String  | 8         |
|    | valid     | Integer | 0 1 255   |
|    | spdExp    | Double  | 2 mps 255 |

## B.5.17

8.5.14.3.1 42 43 44  
CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.17.1

|  |           |         |                |
|--|-----------|---------|----------------|
|  |           |         |                |
|  | vehicleId | String  |                |
|  | valid     | Integer | 0 1 255        |
|  | velocity  | Double  | 2 mps          |
|  | inRamp    | Integer | 0 1 255        |
|  | lcValid   | Integer | 0 1 2<br>3 255 |
|  | spdExp    | Double  | 2 mps 255      |
|  | d2Point   | Double  | 1 m            |

## B.5.18 AEB

8.5.5 23 8.5.10.3.1 34  
CLOUD2VEH\_ADVICE  
CLOUD2VEH\_ADVICE 8.5.5 23  
CLOUD2VEH\_ADVICE\_FCW

### B.5.18.1 AEB

|  |      |            |          |
|--|------|------------|----------|
|  |      |            |          |
|  | uuid | STRING[36] | 36 UTF-8 |

|  |             |             |                                                   |
|--|-------------|-------------|---------------------------------------------------|
|  |             |             |                                                   |
|  |             |             | uuid                                              |
|  | timestamp   | TIMESTAMP   | ms UTC<br>0xFFFFFFFFFFFFFFFF                      |
|  | alertType   | WORD        | 6518 RSI                                          |
|  | valid       | BYTE        | [0..1] 0 1                                        |
|  | alertRadius | WORD        | [0..1024] dm 0xFFFF                               |
|  | pointNum    | BYTE        | [0..31] 0                                         |
|  | alertPath   | POSITION[N] | N N<br>RSI<br>RSI<br>[0,0,0] POSITION<br>B.5.18.2 |
|  | objType     | BYTE        | [0..3] 0 1<br>2 3 0xFF                            |
|  | velocity    | WORD        | [0..20000] 0.01 m/s 0xFFFF                        |
|  | heading     | DWORD       | [0..3600000] 1e-<br>4 ° 0xFFFFFFFF                |
|  | objPostion  | POSITION2D  | POSITION2D B.5.18.2                               |
|  | fcwLevel    | BYTE        | [0..2] 0 1 1<br>2 2 0xFF                          |
|  | fcwDistance | WORD        | [0..65534] 0.1m<br>0xFFFF                         |
|  | fcwLaneId   | BYTE        | [0.255] laneId 0<br>1                             |

### B.5.18.2

|   |              |  |      |               |  |       |                                 |
|---|--------------|--|------|---------------|--|-------|---------------------------------|
|   |              |  | BYTE |               |  |       |                                 |
| 1 | POSIT<br>ION |  | 12   | longi<br>tude |  | DWORD | [0..3600000000]<br>1e-7 ° 180 - |

|   |                |  |      |               |  |       |                                                                                   |
|---|----------------|--|------|---------------|--|-------|-----------------------------------------------------------------------------------|
|   |                |  | BYTE |               |  |       |                                                                                   |
|   |                |  |      |               |  |       | 180.0000000 ° 180.0000000 °<br>0<br>0xFFFFFFFF                                    |
|   |                |  |      | latit<br>ude  |  | DWORD | [0..1800000000]<br>1e-7 ° 90 -<br>90.0000000 ° 90.0000000 °<br>0<br>0xFFFFFFFF    |
|   |                |  |      | eleva<br>tion |  | DWORD | [0..70000]<br>dm 5000 -5000<br>dm 65000 dm 0xFFFFFFFF                             |
| 2 | POSIT<br>ION2D |  | 8    | longi<br>tude |  | DWORD | [0..3600000000]<br>1e-7 ° 180 -<br>180.0000000 ° 180.0000000 °<br>0<br>0xFFFFFFFF |
|   |                |  |      | latit<br>ude  |  | DWORD | [0..9000000000]<br>1e-7 ° 90 -<br>90.0000000 ° 90.0000000 °<br>0<br>0xFFFFFFFF    |

## B.5.19

### 8.5.14.3.1 42 43 44 CLOUD2VEH\_ADVICE\_COM\_RSI

#### B.5.19.1

|  |           |         |              |
|--|-----------|---------|--------------|
|  |           |         |              |
|  | vehicleId | String  |              |
|  | valid     | Integer | 0 1 255      |
|  | velocity  | Double  | 2 mps        |
|  | inRamp    | Integer | 0 1 255      |
|  | lcValid   | Integer | 0 1<br>2 255 |
|  | d2RV      | Double  | 1 m          |

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## B.5.20

8.5.14.3.1    42       43       44  
CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.20.1

|  |           |         |                     |
|--|-----------|---------|---------------------|
|  |           |         |                     |
|  | vehicleId | String  |                     |
|  | valid     | Integer | 0       1       255 |
|  | RsiLaneId | Integer | 1<br>255            |
|  | d2RV      | Double  | 1       m           |

## B.5.21

8.5.14.3.1    42       43       44  
CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.21.1

|  |             |         |                     |
|--|-------------|---------|---------------------|
|  |             |         |                     |
|  | valid       | Integer | 0       1       255 |
|  | laneOfEvent | Array   | 1<br>255            |
|  | d2Event     | Double  | 1       m           |

## B.5.22

8.5.14.3.1    42       43       44  
CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.22.1

|  |           |         |                     |
|--|-----------|---------|---------------------|
|  |           |         |                     |
|  | vehicleId | String  |                     |
|  | valid     | Integer | 0       1       255 |
|  | RsiLaneId | Integer | 1<br>255            |
|  | d2Event   | Double  | 1       m           |

## B.5.23

8.5.14.3.1    42       43       44

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## CLOUD2VEH\_ADVICE\_COM\_RSI

### B.5.23.1

|  |           |         |          |
|--|-----------|---------|----------|
|  |           |         |          |
|  | vehicleId | String  |          |
|  | valid     | Integer | 0 1 255  |
|  | RsiLaneId | Integer | 1<br>255 |
|  | d2Event   | Double  | 1 m      |
|  | heading   | Double  | 4 deg    |



## B.6

### B.6.1

#### B.6.1.1

| ID | vehicleId        | String           | 8                                       |
|----|------------------|------------------|-----------------------------------------|
|    | controlMode      | Integer          | [1..2] 1 2                              |
|    | cloudMessageId   | Long             | $[0..2^{64}-1]$<br>2 <sup>64</sup> -1 1 |
|    | driveControlData | DriveControlData | B.6.1.2<br>DriveControlData             |
|    | stateControlData | StateControlData | B.6.1.3<br>StateControlData             |

#### B.6.1.2 DriveControlData

|  | steeringAngle           | Integer | $[0..200000000]$ , 1e-4 °<br>1000 -1000.0000 ° 1000.0000 ° ,<br>0xFFFFFFFF |
|--|-------------------------|---------|----------------------------------------------------------------------------|
|  | steeringAngularVelocity | Integer | $[0..20000]$ 0.01 ° /s<br>100 -100 ° /s 100 ° /s 0xFFFF                    |
|  | accelPos                | Integer | $[0..1000]$ 0.1% 0xFFFF                                                    |
|  | brakeFlag               | Integer | $[0..1]$ 0<br>1 0xFF                                                       |
|  | brakePos                | Integer | $[0..1000]$ 0.1% 0xFFFF                                                    |
|  | tapPos                  | Integer | $[0..50]$ 0 1-20<br>1 1 2 2<br>21-30<br>21 R1 22 R2 31<br>D 32 R 33 P      |

|  |  |  |                                                                                                                |
|--|--|--|----------------------------------------------------------------------------------------------------------------|
|  |  |  |                                                                                                                |
|  |  |  | 34 N                      35 S<br>36 L                      37 H      38 HL<br>39-50                      0xFF |

#### B.6.1.3 StateControlData

|  |         |         |                                                                                                                                     |
|--|---------|---------|-------------------------------------------------------------------------------------------------------------------------------------|
|  |         |         |                                                                                                                                     |
|  | lights  | Integer | B.6.1.4 light                                                                                                                       |
|  | wipers  | Integer | [0..5] 0                      1                      2<br>3                      4                      5                      0xFF |
|  | doors   | Integer | B.6.1.5 door                                                                                                                        |
|  | windows | Integer | B.6.1.6<br>window                                                                                                                   |

#### B.6.1.4 light

|          |  |                          |
|----------|--|--------------------------|
|          |  |                          |
| BIT0     |  | 0                      1 |
| BIT1     |  | 0                      1 |
| BIT2     |  | 0                      1 |
| BIT3     |  | 0                      1 |
| BIT4     |  | 0                      1 |
| BIT5     |  | 0                      1 |
| BIT6     |  | 0                      1 |
| BIT7     |  | 0                      1 |
| BIT8     |  | 0                      1 |
| BIT9     |  | 0                      1 |
| BIT10    |  | 0                      1 |
| BIT11    |  | 0                      1 |
| BIT12    |  | 0                      1 |
| BIT13 14 |  | -                        |
| BIT15    |  | 0                      1 |

#### B.6.1.5 door

|             |  |         |
|-------------|--|---------|
|             |  |         |
| BIT0        |  | 0 1     |
| BIT1        |  | 0 1     |
| BIT2        |  | 0 1     |
| BIT3        |  | 0 1     |
| BIT4        |  | 0 1     |
| BIT5        |  | 0 1     |
| BIT6        |  | 0 1     |
| BIT7        |  | 0 1     |
| BIT8        |  | 0 1     |
| BIT9 13     |  | -       |
| BIT14 BIT15 |  | 0 1 2 3 |

#### B.6.1.6 window

|            |  |         |
|------------|--|---------|
|            |  |         |
| BIT0       |  | 0 1     |
| BIT1       |  | 0 1     |
| BIT2       |  | 0 1     |
| BIT3       |  | 0 1     |
| BIT4       |  | 0 1     |
| BIT5 BIT14 |  | -       |
| BIT15      |  | BIT15 1 |

### B.6.2 POI

#### B.6.2.1 POI

|        |          |        |                |
|--------|----------|--------|----------------|
|        |          |        |                |
| ID     | id       | String |                |
| POI ID | parent   | String | POI POI POI ID |
|        | name     | String |                |
|        | type     | String | /              |
|        | typecode | String | 051118         |
|        | biz_type | String |                |

|        |               |            |                     |
|--------|---------------|------------|---------------------|
|        |               |            |                     |
|        | rddress       | String     |                     |
|        | location      | String     | X,Y                 |
|        | distance      | String     |                     |
| POI    | tel           | String     |                     |
|        | postcode      | String     |                     |
| POI    | website       | String     |                     |
| POI    | pcode         | String     |                     |
| POI    | pname         | String     |                     |
|        | citycode      | String     |                     |
|        | cityname      | String     |                     |
|        | adcode        | String     |                     |
|        | adname        | String     |                     |
| POI    | entr_location | String     | X,Y                 |
| POI    | exit_location | String     | X,Y                 |
| POI id | navi_poiid    | String     |                     |
| ID     | gridcode      | String     |                     |
|        | alias         | String     |                     |
|        | parking_type  | String     | POI                 |
| POI    | tag           | String     |                     |
|        | indoor_map    | String     |                     |
|        | indoor_data   | JSONObject | B.6.2.2 indoor_data |

|  |               |            |                 |
|--|---------------|------------|-----------------|
|  |               |            |                 |
|  | groupby_num   | String     |                 |
|  | business_area | String     |                 |
|  | discount_num  | String     |                 |
|  | biz_ext       | JSONObject | B.6.2.3 biz_ext |
|  | protos        | JSONObject | B.6.2.4 protos  |

#### B.6.2.2 indoor\_data

|            |           |         |  |
|------------|-----------|---------|--|
|            |           |         |  |
| POI<br>POI | cpid      | String  |  |
|            | floor     | Integer |  |
|            | truefloor | String  |  |

#### B.6.2.3 biz\_ext

|  |                 |        |     |
|--|-----------------|--------|-----|
|  |                 |        |     |
|  | rating          | String | POI |
|  | cost            | String | POI |
|  | meal_ordering   | String | POI |
|  | seat_ordering   | String | POI |
|  | ticket_ordering | String | POI |
|  | hotel_ordering  | String | POI |

#### B.6.2.4 protos

|  |       |        |  |
|--|-------|--------|--|
|  |       |        |  |
|  | title | String |  |
|  | url   | String |  |

---

## B.7

### B.7.1

#### B.7.1.1

|  |           |           |         |
|--|-----------|-----------|---------|
|  |           |           |         |
|  | msgId     | String    | msgId   |
|  | partition | Integer   | 65535   |
|  | timestamp | Long      |         |
|  | targets   | JSONArray | B.7.1.2 |

#### B.7.1.2

|       |           |         |                                                         |
|-------|-----------|---------|---------------------------------------------------------|
|       |           |         |                                                         |
|       | uuid      | String  |                                                         |
|       | type      | Integer | B.7.1.3                                                 |
|       | longitude | Double  | 0..180                                                  |
|       | latitude  | Double  | 0..90                                                   |
|       | elevation | Integer | -50000..50000 dm                                        |
|       | speed     | Double  | m/s                                                     |
|       | heading   | Double  | 0..360                                                  |
|       | srcType   | Integer | 1<br>2<br>3<br>4                                        |
| rcuId | rcuIds    | String  | rcu rcuId<br>rcuId<br>"_CV_" rcuId, "_CV_,U-<br>BD0006" |
|       | vehicleId | String  |                                                         |

|     |         |            |                          |
|-----|---------|------------|--------------------------|
|     |         |            |                          |
| CAN | vehicle | JSONObject | CAN srcType 1 2 ,<br>CAN |
|     | plateNo | String     | rcu ,                    |
|     | len     | Integer    | cm                       |
|     | width   | Integer    | cm                       |
|     | height  | Integer    | cm                       |
|     | zindex  | Integer    | 1                        |

B.7.1.3

|                |  |
|----------------|--|
|                |  |
| 0              |  |
| 1              |  |
| 2              |  |
| 3              |  |
| 4              |  |
| 5              |  |
| 6              |  |
| 7              |  |
| 8              |  |
| 9              |  |
| 10             |  |
| 15             |  |
| 60             |  |
| 61             |  |
| 254            |  |
| 255            |  |
| 1 254<br>2 255 |  |

### B.7.2

‘ , 0

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## B.7.3

### B.7.3.1

|  |           |            |         |
|--|-----------|------------|---------|
|  |           |            |         |
|  | crossData | JSONObject | B.7.3.2 |
|  | linkData  | JSONObject | B.7.3.3 |

### B.7.3.2

|  |              |         |           |
|--|--------------|---------|-----------|
|  |              |         |           |
|  | crossId      | String  |           |
|  | carFlow      | Double  | / sum     |
|  | saturation   | Double  | (0-1) max |
|  | avgPassSpeed | Double  | km/h min  |
|  | avgDelay     | Double  | max       |
|  | overRate     | Integer | 1-5 min   |
|  | stopNums     | Integer |           |
|  | time         | Long    |           |

### B.7.3.3

|  |              |         |              |
|--|--------------|---------|--------------|
|  |              |         |              |
|  | linkId       | String  |              |
|  | carFlow      | Double  | / sum        |
|  | blockLevel   | Integer | 1 2 3 4<br>5 |
|  | blockLength  | Double  |              |
|  | saturation   | Double  | (0-1) max    |
|  | avgPassSpeed | Double  | km/h min     |
|  | stopNums     | Integer |              |



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|  |      |      |  |
|--|------|------|--|
|  |      |      |  |
|  | time | Long |  |

## B.7.4

### B.7.4.1

|  |           |           |         |
|--|-----------|-----------|---------|
|  |           |           |         |
|  | crossData | JSONArray | B.7.4.2 |
|  | linkData  | JSONArray | B.7.4.4 |

### B.7.4.2

|  |             |           |         |
|--|-------------|-----------|---------|
|  |             |           |         |
|  | crossId     | String    |         |
|  | dataDetails | JSONArray | B.7.4.3 |

### B.7.4.3

|  |         |        |       |
|--|---------|--------|-------|
|  |         |        |       |
|  | minute  | String | mm:ss |
|  | speed   | Long   | km/h  |
|  | carFlow | Long   |       |

### B.7.4.4

|  |             |           |         |
|--|-------------|-----------|---------|
|  |             |           |         |
|  | linkId      | String    |         |
|  | dataDetails | JSONArray | B.7.4.5 |

#### B.7.4.5

|  |         |        |       |
|--|---------|--------|-------|
|  |         |        |       |
|  | minute  | String | mm:ss |
|  | speed   | Long   | km/h  |
|  | carFlow | Long   |       |

## B.8

### B.8.1

#### B.8.1.1

|      |           |         |                  |
|------|-----------|---------|------------------|
|      |           |         |                  |
|      | lane_id   | String  |                  |
|      | mesh_id   | Integer |                  |
| link | link_id   | String  | 1                |
|      | snode_id  | String  |                  |
|      | enode_id  | String  |                  |
|      | length    | Float   |                  |
|      | direction | Integer | 1<br>2<br>3<br>0 |
|      | lane_seq  | Integer | 1                |
|      | lane_type | Integer | B.8.1.2          |
|      | width     | Float   |                  |
|      | lmkg_id   | String  | lane roadMark    |
|      | rmkg_id   | String  | lane roadMark    |
|      | chg_flg   | Integer | 0                |

|  |              |         |                |
|--|--------------|---------|----------------|
|  |              |         |                |
|  |              |         | 1<br>2<br>3    |
|  | vt_type      | Integer | 0<br>1<br>2    |
|  | pre_lanes    | String  |                |
|  | suc_lanes    | String  |                |
|  | spd_max      | Integer | link           |
|  | spd_min      | Integer | link           |
|  | spd_max_type | Integer | 0<br>1<br>2    |
|  | spd_min_type | Integer | 0<br>1<br>2    |
|  | inters_id    | String  | 1              |
|  | conn_type    | Integer | 0-             |
|  | arrow_type   | Integer | rns_arrow type |

|  |            |         |         |
|--|------------|---------|---------|
|  |            |         |         |
|  | trans_type | Integer |         |
|  | memo       | String  |         |
|  | turn_info  | Integer | B.8.1.3 |

#### B.8.1.2

|  |         |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--|---------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |         |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|  | lane_id | String | <p>32bit , 0~31bit,<br/> bit ( ), 0/1<br/> / , : 0000 0000 0000 0000 0000 0000<br/> 0001 0001</p> <p>0bit: Regular Drivig<br/> Lane</p> <p>1bit: Bicycle Lane</p> <p>2bit: Predstrain Lane</p> <p>3bit Motor-Bicyle Mixed<br/> Lane</p> <p>4bit RapidLane</p> <p>5bit Slow Lane</p> <p>6bit (Accelerate Lane)</p> <p>7bit (Decelerate Lane)</p> <p>8bit Increase Lane</p> <p>9bit Decrease Lane</p> <p>10bit Waiting Turn Lane</p> <p>11bit Emergence Lane</p> |

|  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|  |  |  | 12bit                  Escape Lane<br>13bit                  Urgency Stop strip<br>Lane<br>14bit                  Parking Lane<br>15bit                  Exclusive Lane<br>16bit                  Bus Exclusive<br>Lane<br>17bit                  Reversal Lane ,<br>18bit                  Tidal Lane<br>19bit                  Shoulder Lane<br>20bit ETC                  ETC Lane<br>21bit<br>22bit<br>23bit HOV<br>24—31bit |

### B.8.1.3

|  |           |        |                                           |
|--|-----------|--------|-------------------------------------------|
|  |           |        |                                           |
|  | turn_info | Intger | 1<br>3<br>2<br>4<br>5<br>6<br>7<br>8<br>9 |

---

|  |  |  |    |
|--|--|--|----|
|  |  |  | 10 |
|  |  |  | 11 |
|  |  |  | 12 |
|  |  |  | 13 |
|  |  |  | 14 |
|  |  |  | 15 |
|  |  |  | 16 |
|  |  |  | 17 |
|  |  |  | 18 |
|  |  |  | 19 |
|  |  |  | 20 |
|  |  |  | 21 |
|  |  |  | 22 |
|  |  |  | 23 |
|  |  |  | 24 |
|  |  |  | 25 |
|  |  |  | 26 |
|  |  |  | 27 |
|  |  |  | 28 |
|  |  |  | 29 |
|  |  |  | 30 |
|  |  |  | 99 |