毕方教练团

DDD驱动测试体系建设

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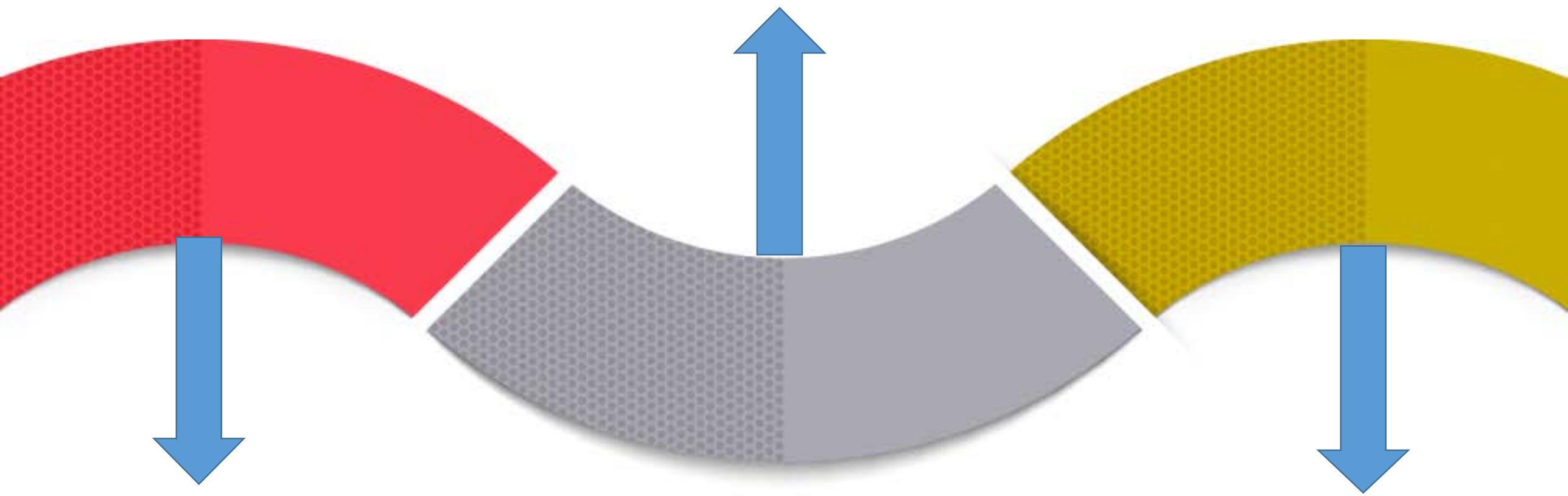
2017-12-9

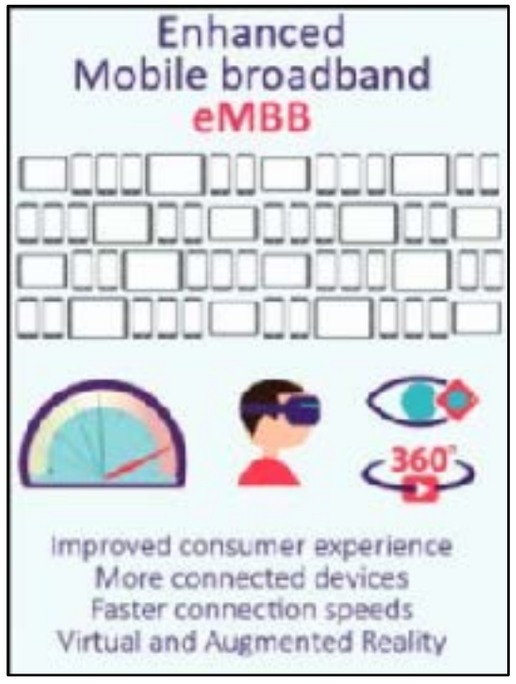
测试体系

目录

典型问题

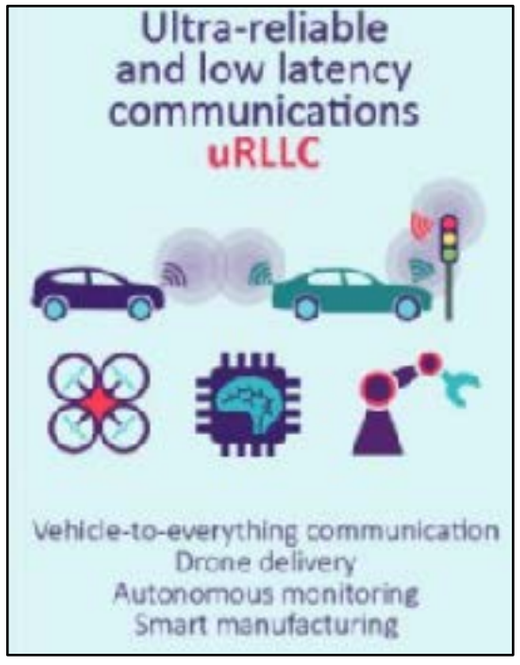


测试的场景问题



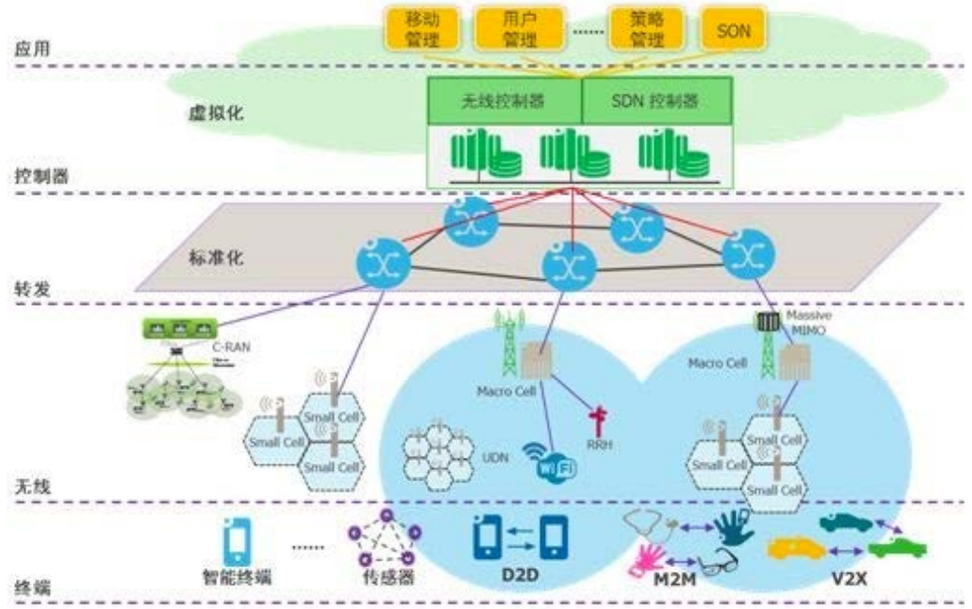
大容量

大规模互联



实时通讯

测试的环境问题



工具软件 **系统设备** **通信仪表**

测试的人员问题

- 代码能力欠缺
- 不了解实现细节

- 不熟悉测试业务
- 不熟悉测试环境

自动化测试

数据驱动的用例设计

- 自研自动化测试平台
- 测试数据和测试过程分离
- 面向过程的脚本语言
- 一个用例一个文件

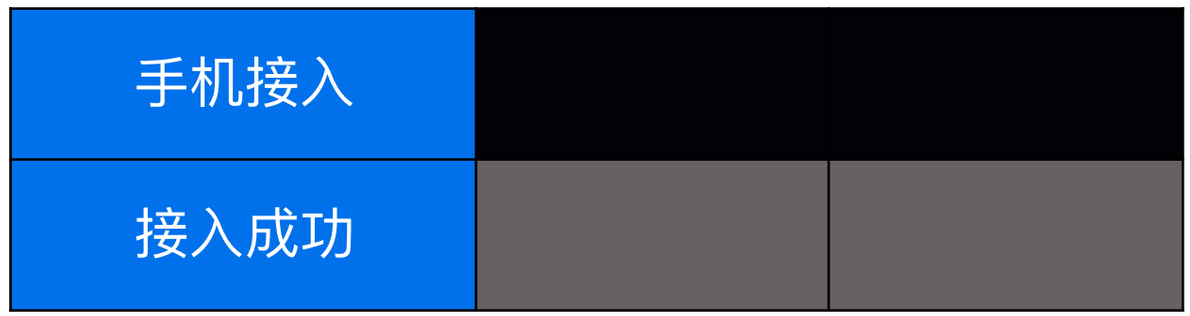
用例示意

存在的问题

- 代码复用困难
- 难以理解，过大的用例文件
- 不易变化，难以扩展
- 平台影响用例实现效率
- 用例较开发速度低

关键字驱动的用例设计

- RobotFramework
- 表格式语法
- 关键字驱动
- Python
- 面向资源设计

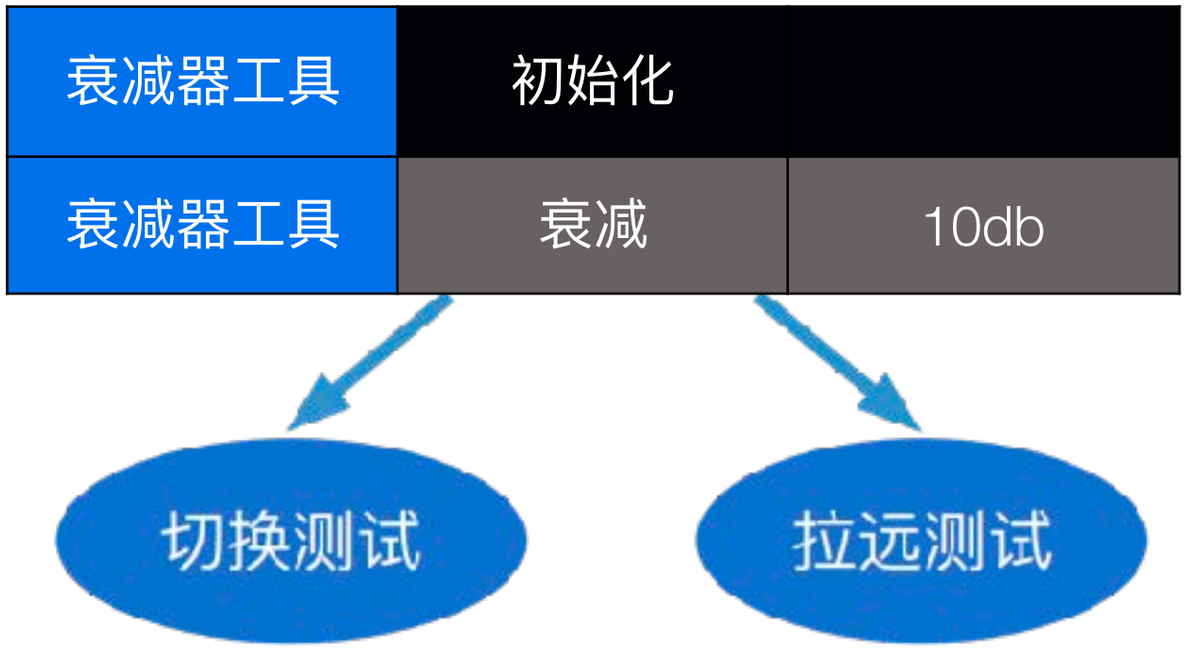


用例示意

KW:手机接入

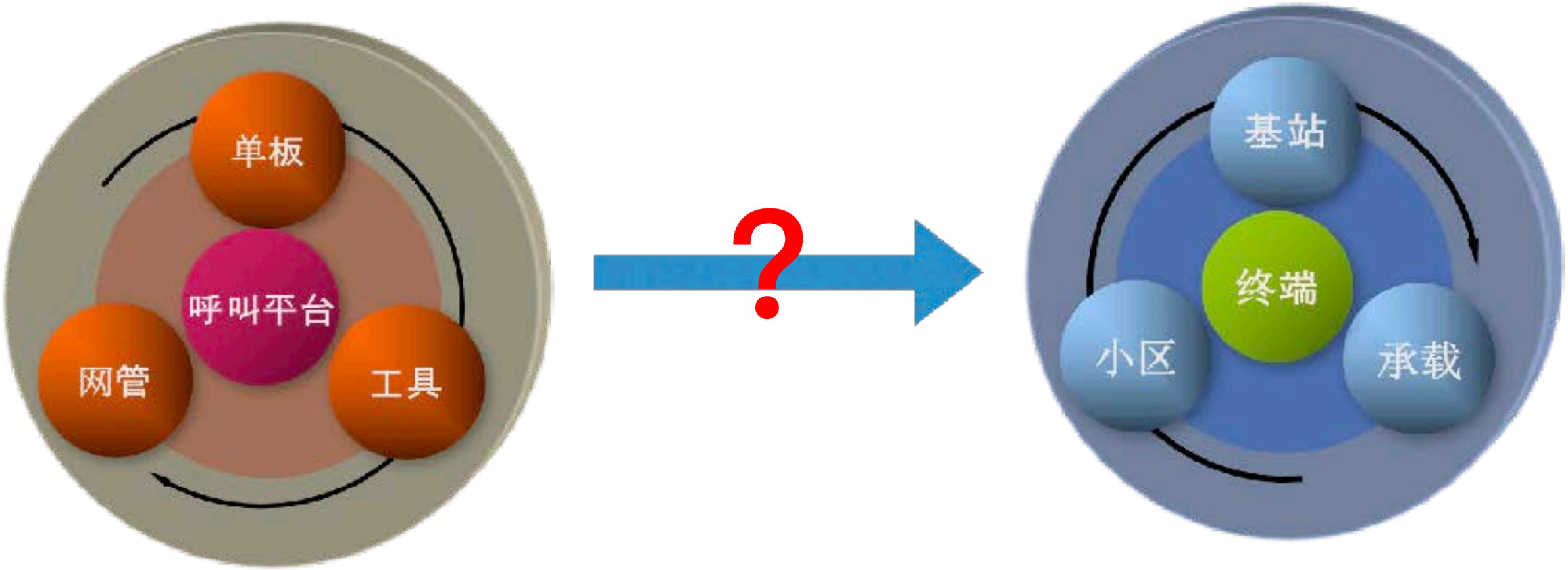
未解决的问题

- 抽象层次低
- 人员介入困难
- 稳定性差
- 可扩展性



目录

认知升级

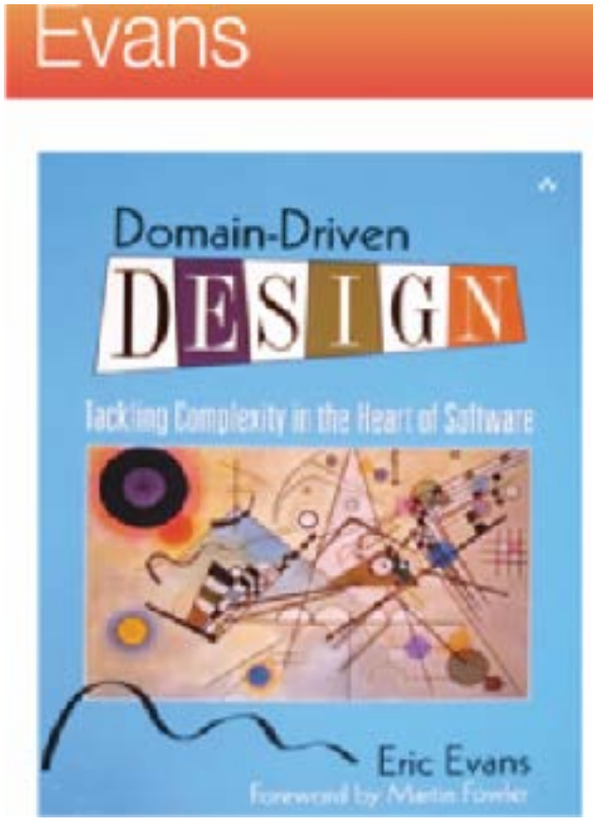


资源模型

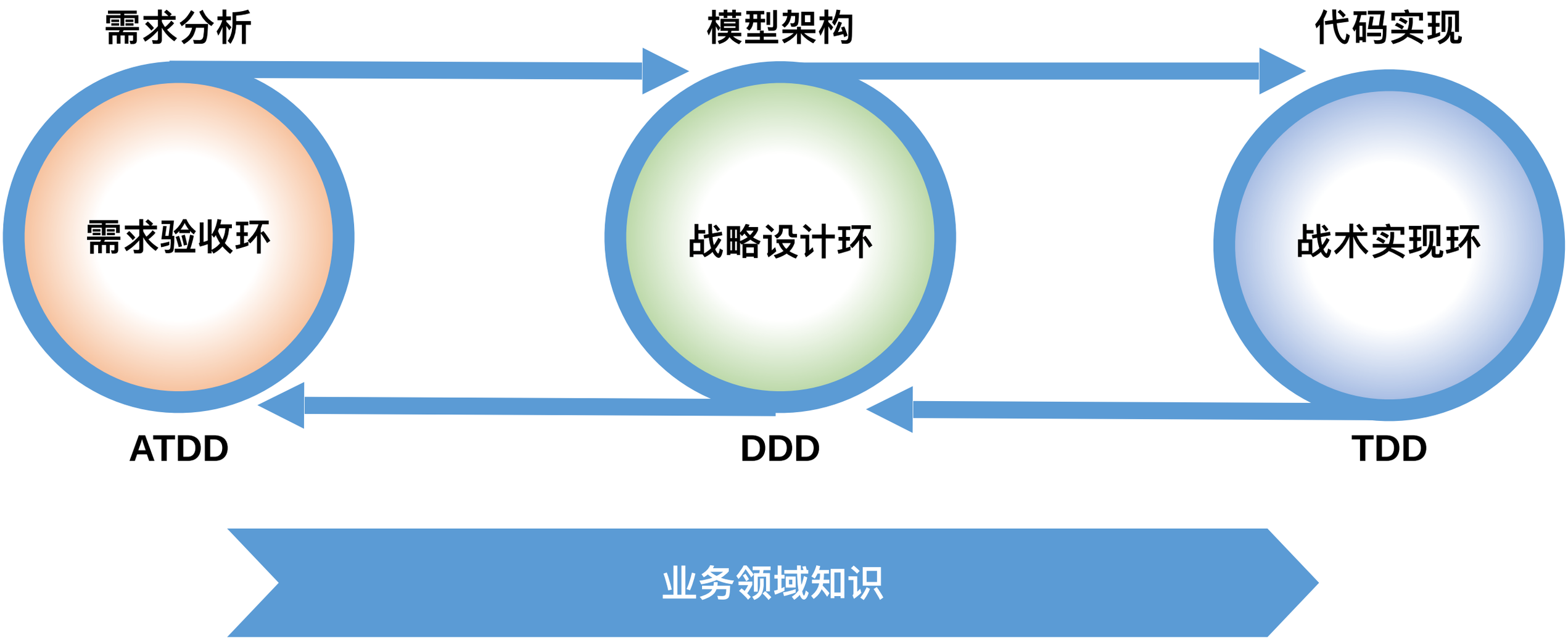
业务模型

DDD领域驱动设计

领域驱动设计是一种设计方法，试图解决的问题是软件的难以理解、难以演化。领域驱动设计试图分离技术实现的复杂性，用**围绕业务概念**来构建领域模型的方式来控制业务的复杂性。



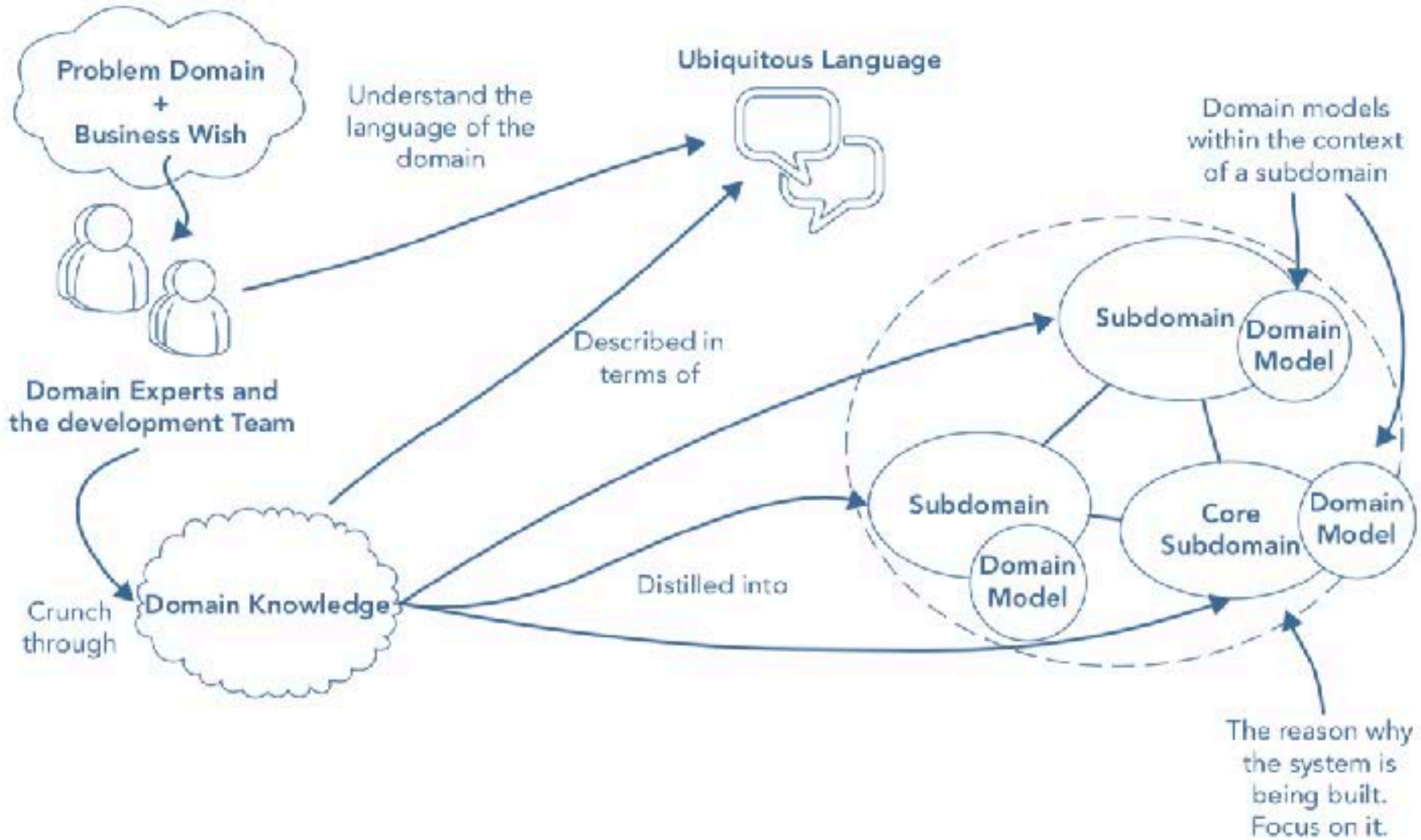
研发闭环



需求&验收

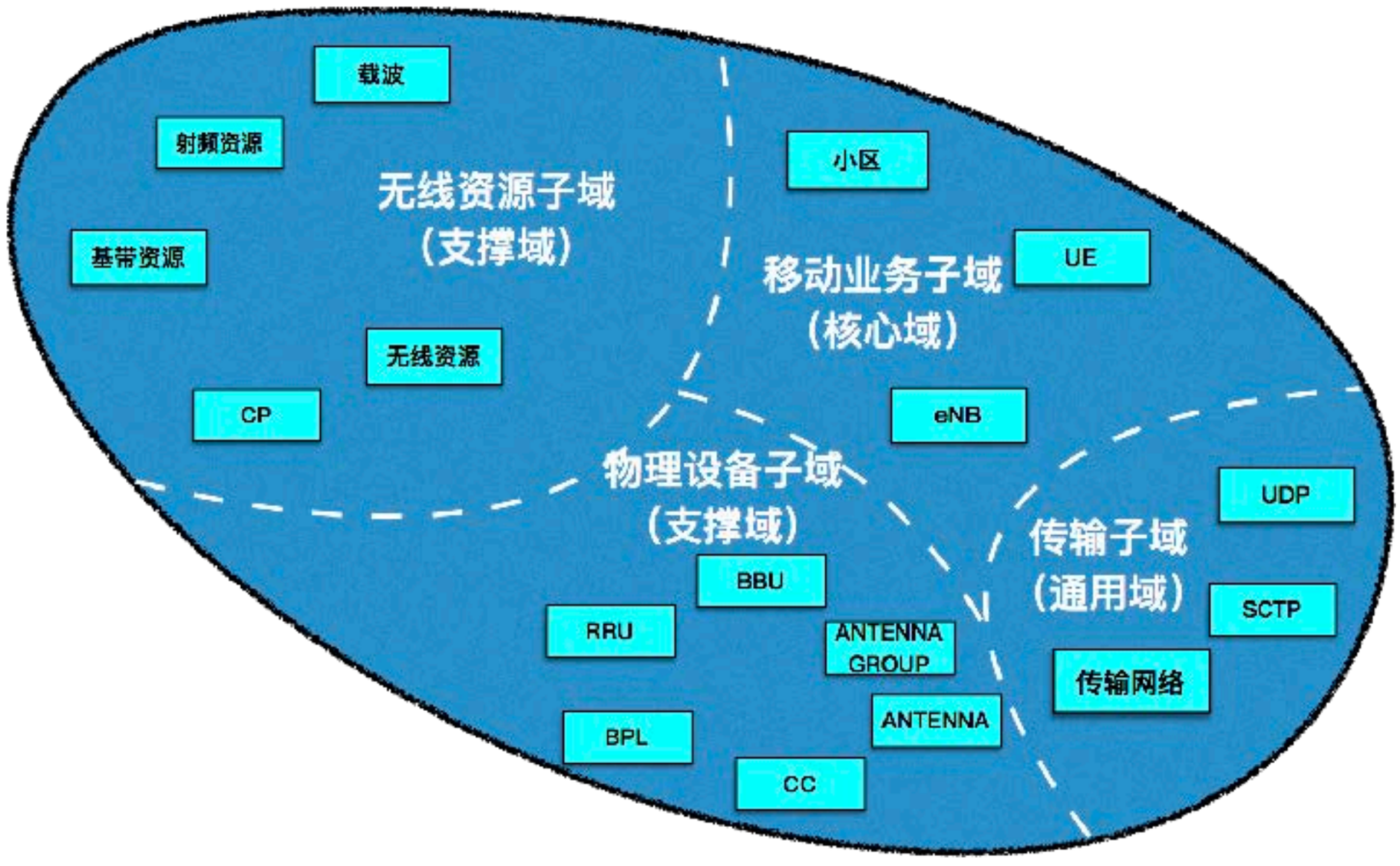
解决用例设计中的全面性和有效性问题

战略设计

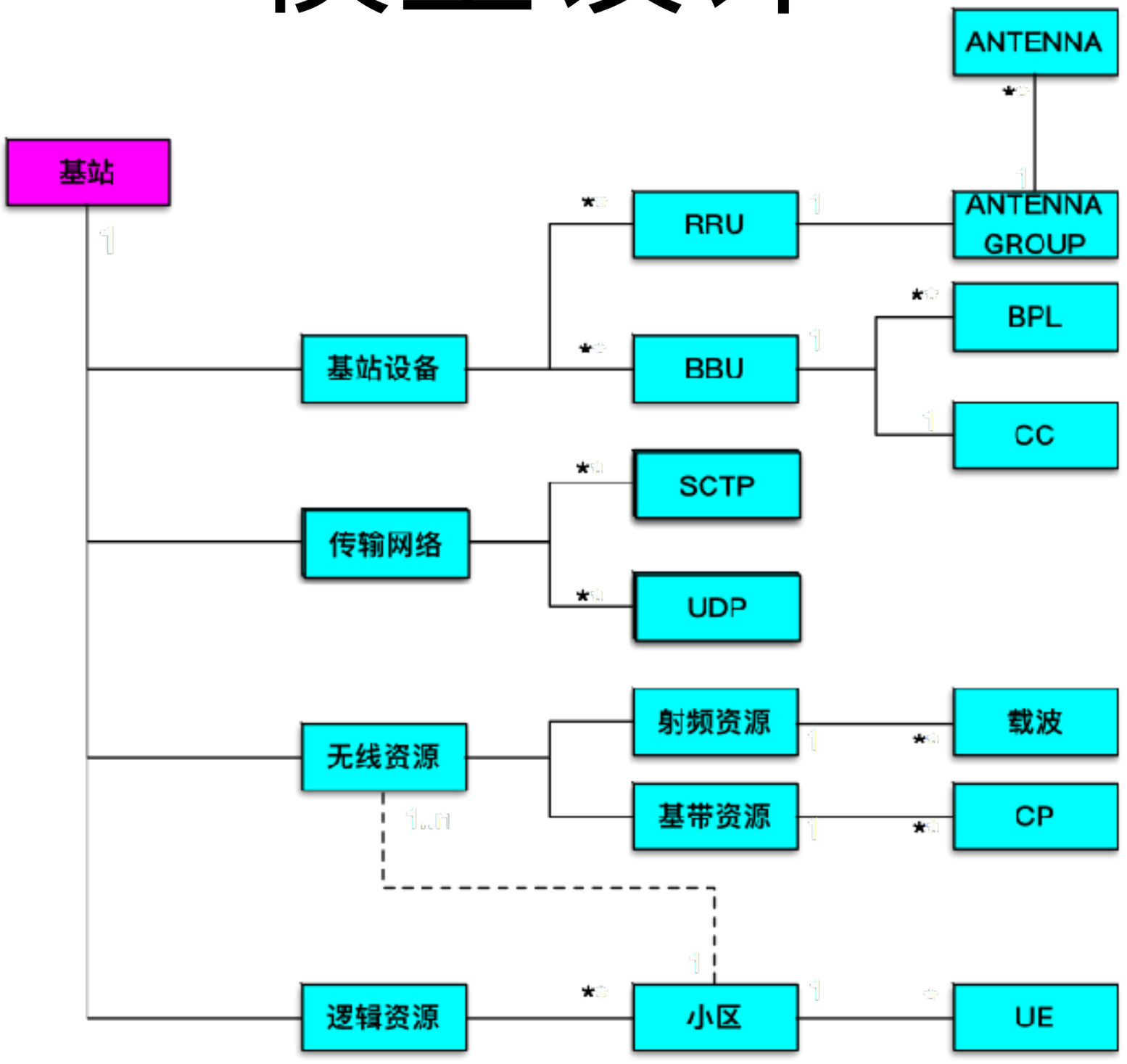

Problem Domain
+
Business Wish
Domain Experts and
the development Team
Understand the
language of the
domain
Ubiquitous Language
Described in
terms of
Domain models
within the context
of a subdomain
Subdomain
Domain
Model
Subdomain
Domain
Model
Core
Subdomain
Domain
Model
Crunch
through
Domain Knowledge
Distilled into
The reason why
the system is
being built.
Focus on it.

设计流程

识别核心域

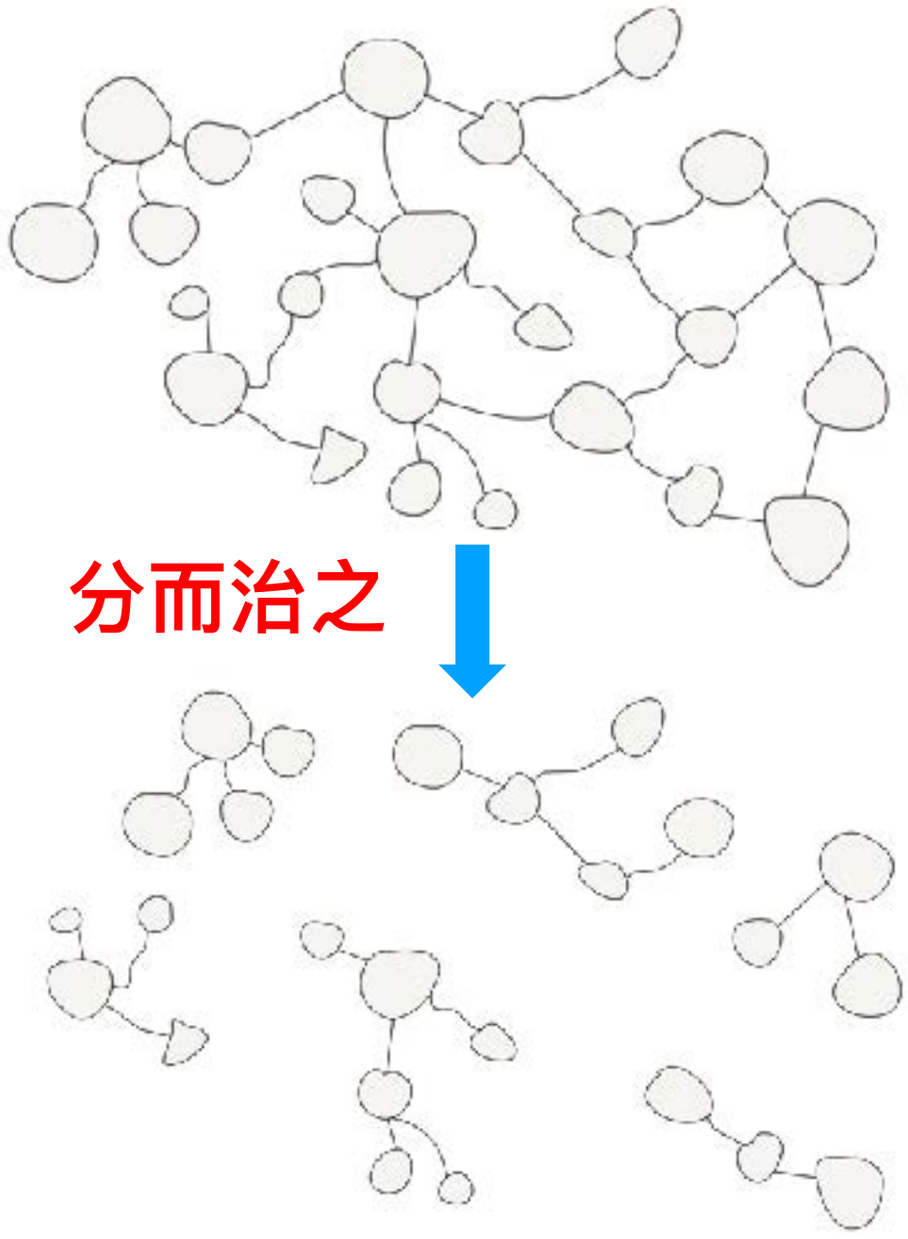

载波
射频资源
无线资源子域
（支撑域）
基带资源
无线资源
CP
小区
移动业务子域
（核心域）
UE
eNB
物理设备子域
（支撑域）
BBU
RRU
ANTENNA GROUP
BPL
CC
ANTENNA
传输子域
（通用域）
UDP
SCTP
传输网络

模型设计

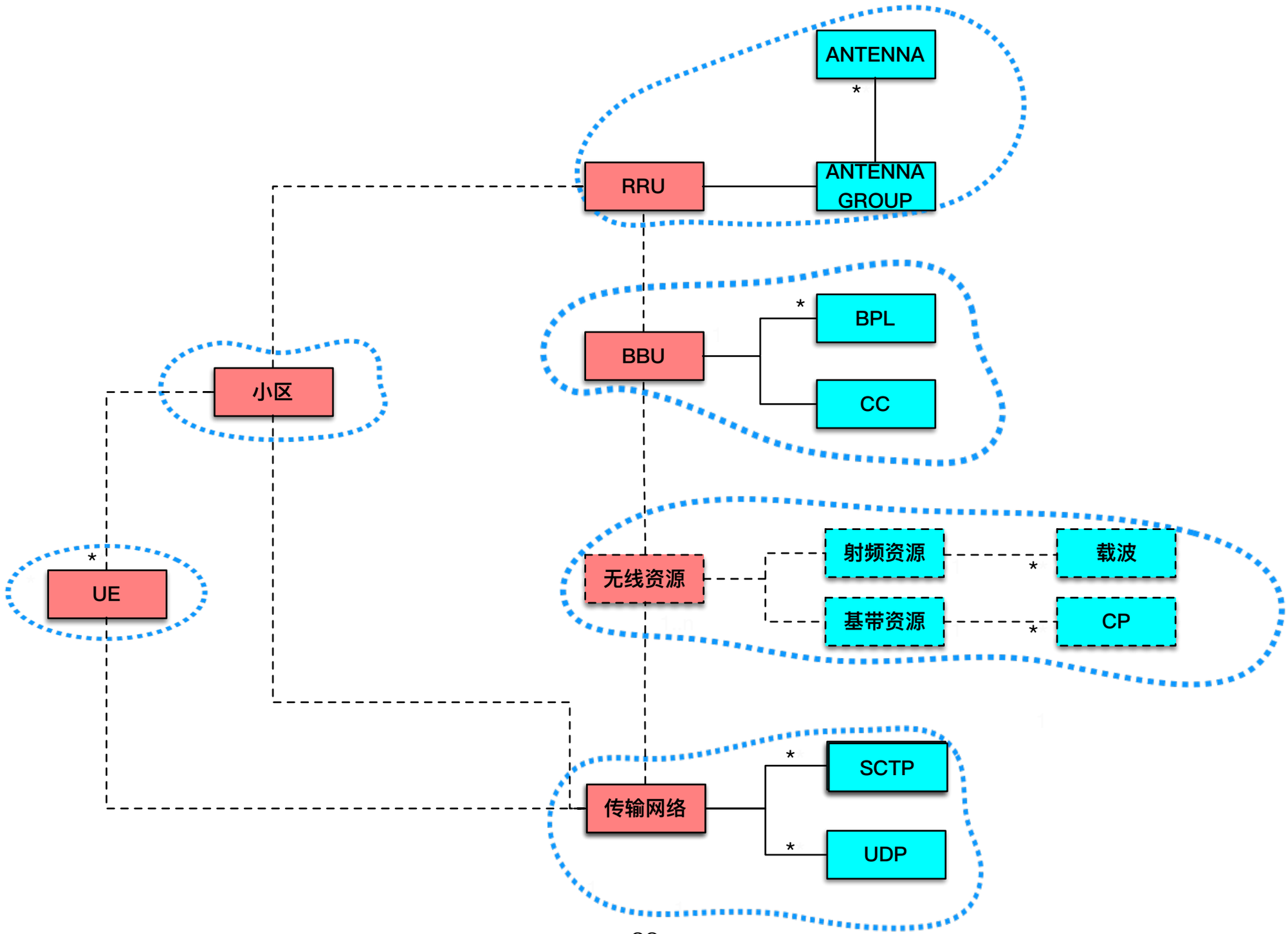

基站
基站设备
传输网络
无线资源
逻辑资源
RRU
BBU
SCTP
UDP
射频资源
基带资源
小区
ANTENNA
ANTENNA GROUP
BPL
CC
载波
CP
UE

建模思索

- 聚合要尽可能小
- 对聚合内部的实体访问必须通过聚合根（可能与直观认知相违背）
- 聚合内部的实体可以持有其他聚合的聚合根ID

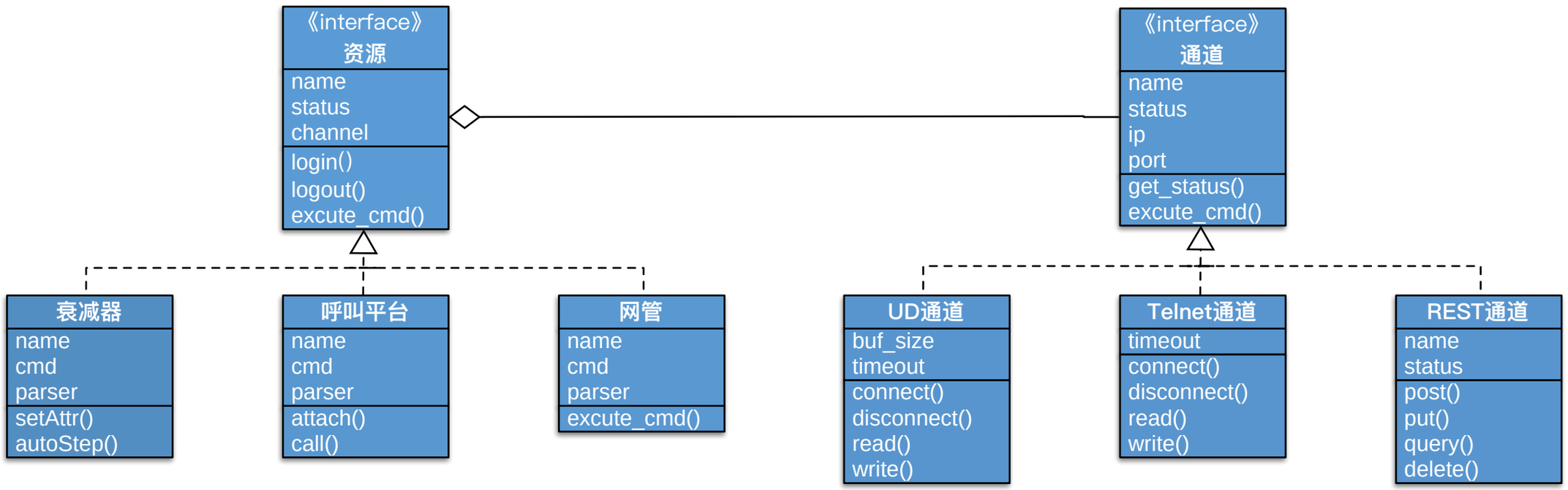


模型精炼

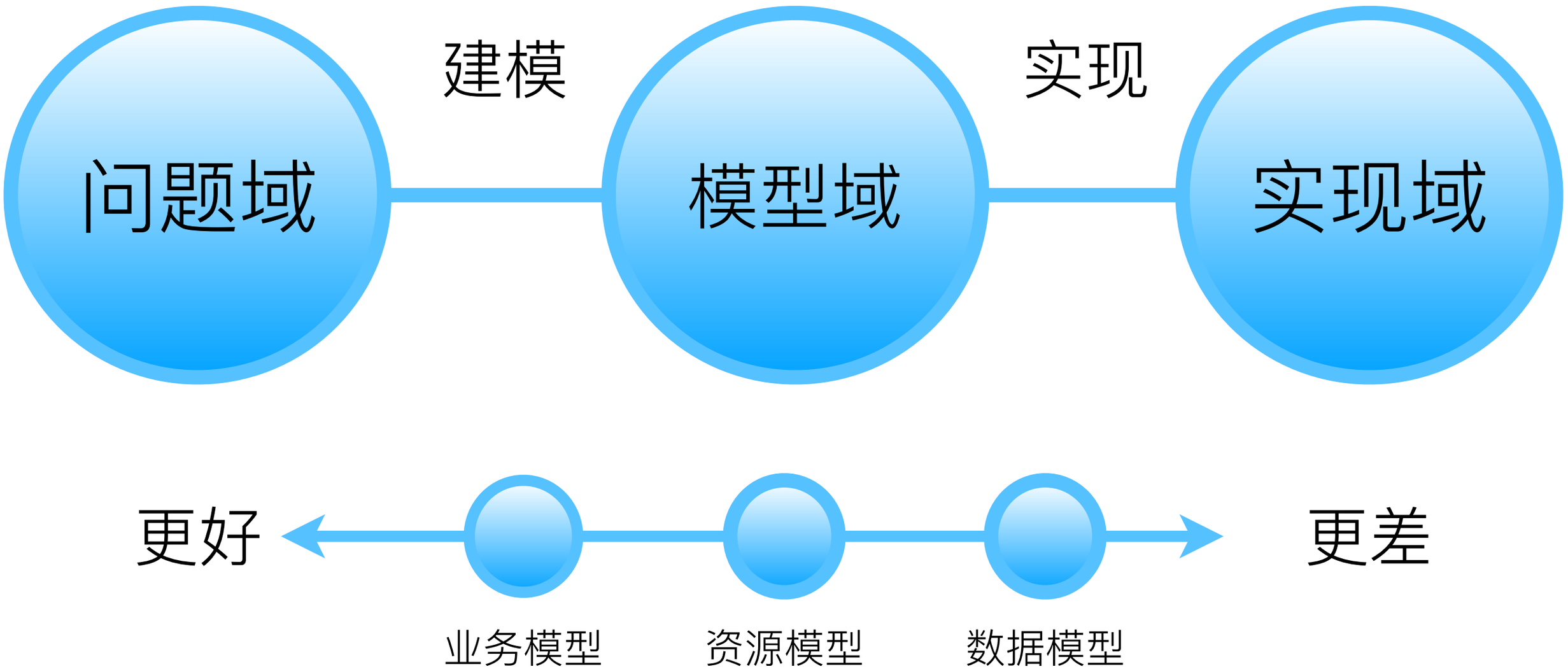

ANTENNA
*
RRU
ANTENNA GROUP
*
BPL
BBU
CC
小区
*
UE
无线资源
射频资源
*
载波
基带资源
*
CP
*
SCTP
传输网络
*
UDP

资源模型

- 封装复杂的资源对象操作逻辑
- 分离设备和通道两个变化方向
- 抽象命令处理过程

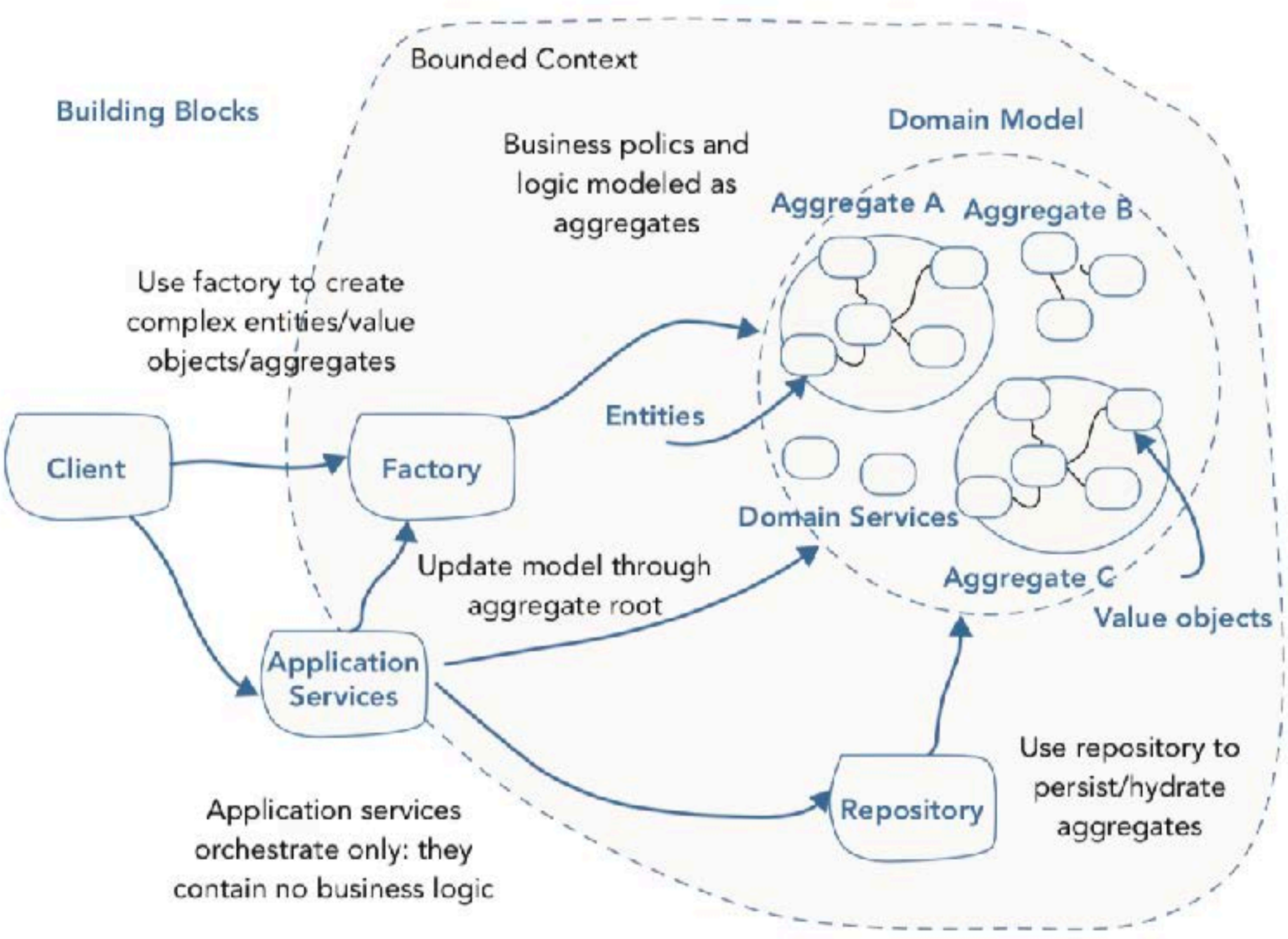


建模的本质



目录

战术设计


Bounded Context
Building Blocks
Domain Model
Business polics and logic modeled as aggregates
Aggregate A
Aggregate B
Use factory to create complex entities/value objects/aggregates
Entities
Client
Factory
Domain Services
Update model through aggregate root
Aggregate C
Value objects
Application Services
Use repository to persist/hydrate aggregates
Repository
Application services orchestrate only: they contain no business logic

实体

- 实体具有唯一ID
- 完整的生命周期
- 通过ID比较

Focus on who ,not on what.

```python
class Entity(object):
    """the entity meta class
    """
    __metaclass__ = ABCMeta
    _instance_id_generator = count()

    def __init__(self, id):
        self._id = id
        self._instance_id = next(Entity._instance_id_generator)

    def __eq__(self, other):
        return self._id == other.id

    def __ne__(self, other):
        return not self == other

    @property
    def instance_id(self):
        """the instance id of entity"""
        return self._instance_id

    @property
    def id(self):
        """the property of id"""
        return self._id
```

值对象

- 不具有身份
- 不可变型
- 通过所有属性比较

Focus on what ,not on who.

```
class ValueObject(object):
    __metaclass__=ABCMeta

    def __new__(cls, *args, **kwargs):
        self = super(ValueObject, cls).__new__(cls)

        args_spec = ArgsSpec(self.__init__)

        check_class_are_initialized()
        assign_instance_arguments()
        check_invariants()

        return self

    def __setattr__(self, name, value):
        raise CannotBeChangeException()

    def __eq__(self, other):
        return self.__dict__ == other.__dict__

    def __ne__(self, other):
        return self.__dict__ != other.__dict__

    @property
    def hash(self):
        return hash(self.__class__) and hash(frozenset(self.__dict__.i
```

聚合

- 拥有一个聚合根
- 聚合根拥有全局唯一ID
- 通过聚合根修改聚合内对象
- 销毁聚合根时销毁所有对象

工厂

- 封装复杂的领域对象创建逻辑
- 创建失败需抛出异常通知调用方

```python
from abc import ABCMeta, abstractmethod


class Factory(object):
    """Factory abstract class
    """
    __metaclass__ = ABCMeta

    @abstractmethod
    def create(self, *args):
        """the create method of factory"""
        raise NotImplementedError
```

仓储

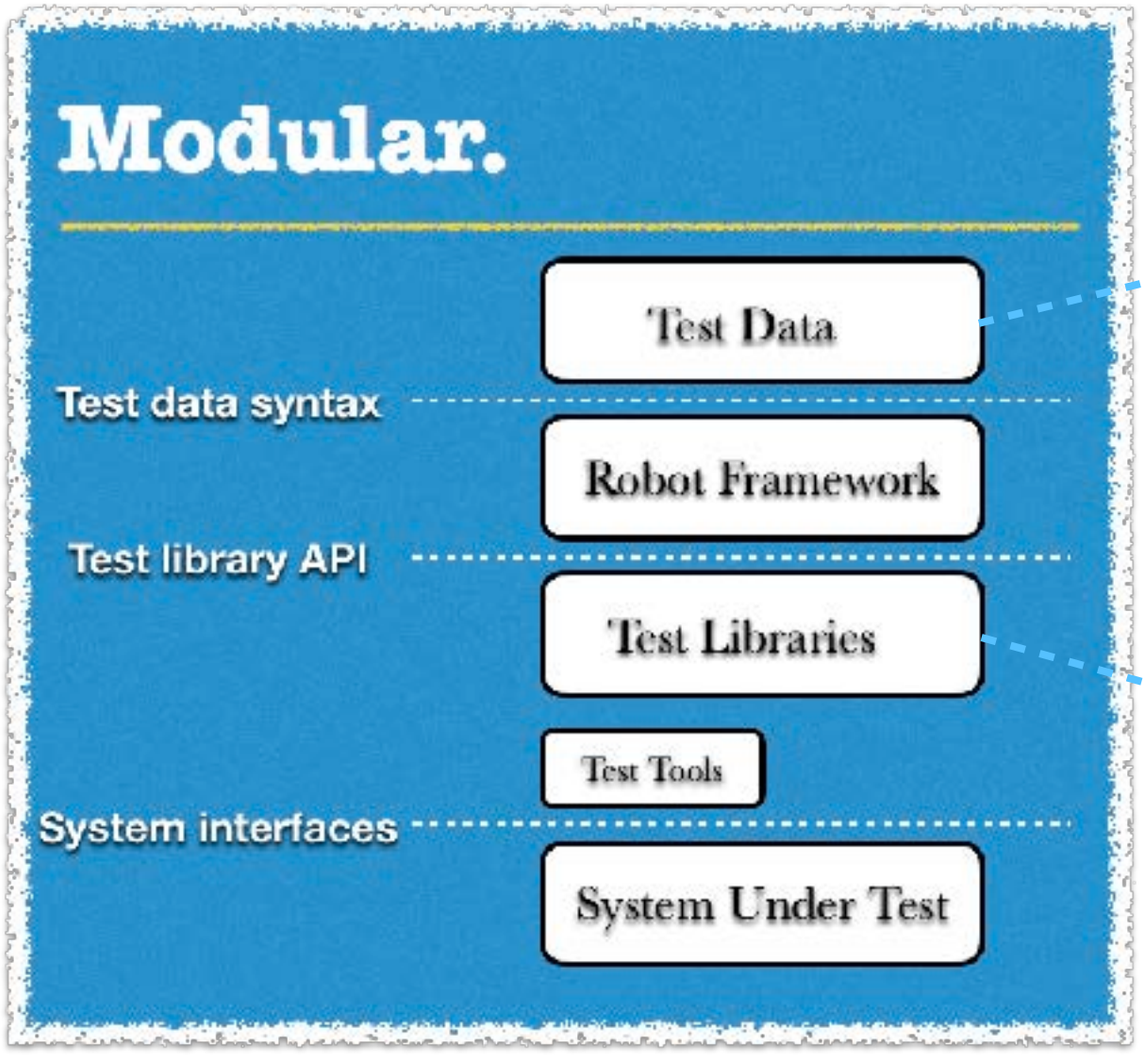
- 存储聚合的容器
- 封装与数据库的交互逻辑
- 接口根据业务需要来构建
- 由Domain定义，实现交给具体类
- 延迟加载是种异味

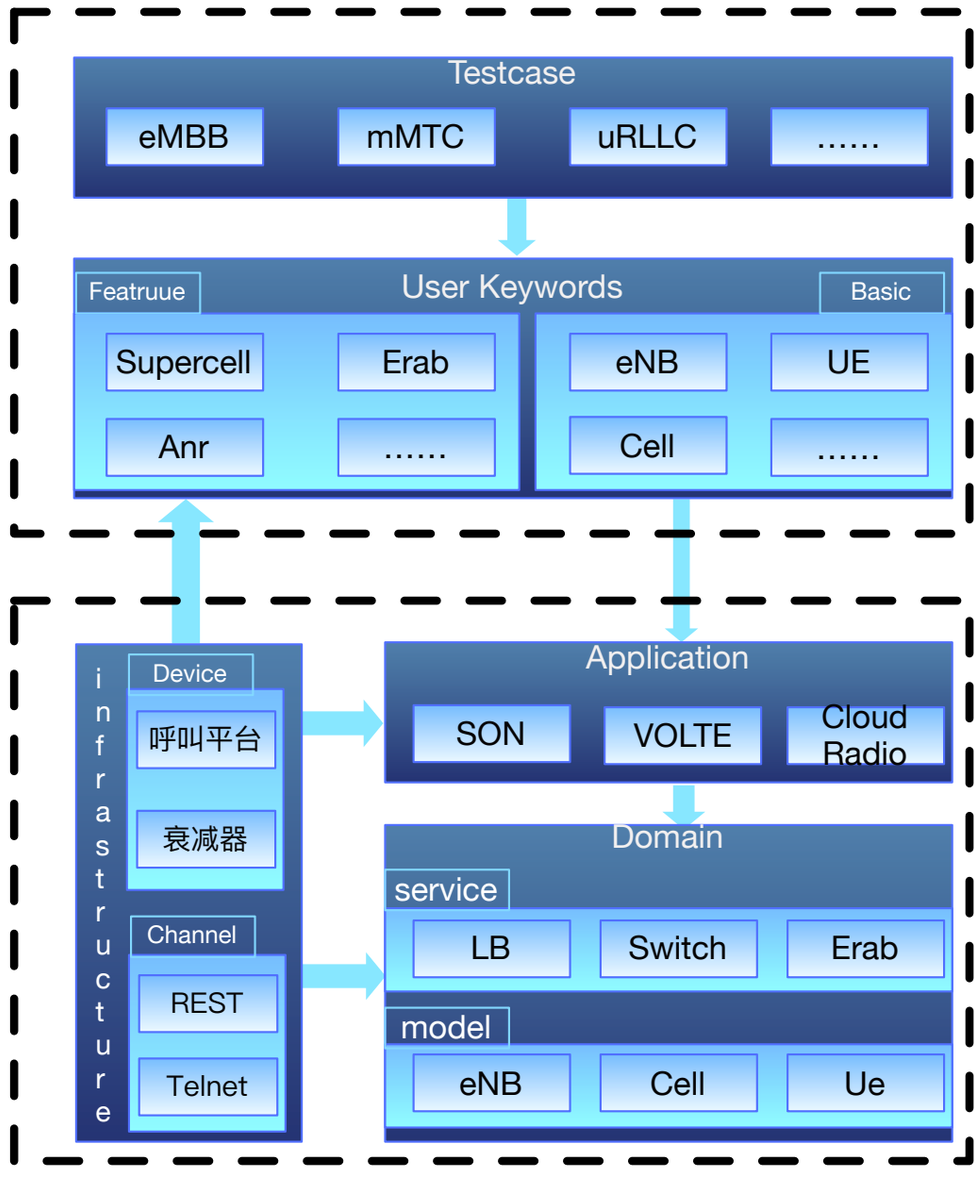
```
@Singleton
class CellRepository(ObjectRepository):
    def __init__(self):
        ObjectRepository.__init__(self)

    ......

    def find_all_available_cells(self):
        return filter(lambda x: x.get_cell_state() == 'availa
                      self._objDict.values())
```

领域服务

- 协调多个领域
- 无业务状态
- 封装业务逻辑，避免领域逻辑外泄的操作
- 以动词开头来命名

分层架构


Modular.
Test Data
Test data syntax
Robot Framework
Test library API
Test Libraries
Test Tools
System interfaces
System Under Test


Testcase
eMBB
mMTC
uRLLC
.....
Featruue
User Keywords
Basic
Supercell
Erab
eNB
UE
Anr
.....
Cell
.....
infrastructure
Device
呼叫平台
衰减器
Channel
REST
Telnet
Application
SON
VOLTE
Cloud Radio
Domain
service
LB
Switch
Erab
model
eNB
Cell
Ue

演进过程中的问题

- 充血模型
- 上帝类
- 单场景只使用少量方法

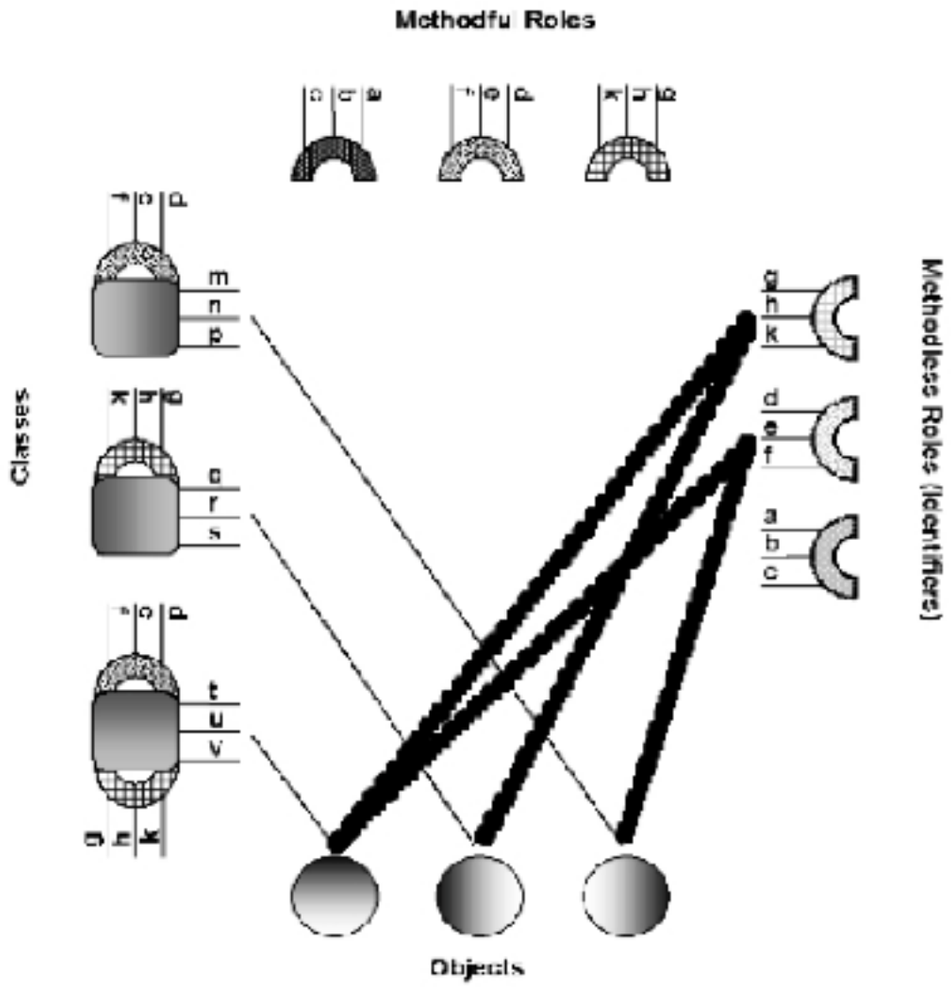
DCI

- 通过给予系统行为一等公民的地位来提升面向对象的代码的可读性；

- 干净地分离高频变化的系统行为（描述系统做什么）和低频变化的领域知识（描述系统是什么），而非将两者混合在一个类中；

- 帮助理解系统级状态和行为，而非仅有对象状态和行为；

- 基于对象而非基于类的思维方式，前者更接近于人类心智模型，而后者，在面向对象编程语言中常导致过早地屏蔽了基于对象的思考。



小类，大对象

整体效果

- 用例开发效率大幅提升
- 在整个公司范围推广基于DDD的测试方法
- 共计实现用例数超过10W

“ST领域”是DDD可全面落地的领域！

相关资源

代码示例：

- https://github.com/kaelzhang81/python_ddd_sample

动态DDD：

- https://github.com/kaelzhang81/ddd-dynamic

毕方教练团