Baidu Mobile Application & Search On Mobile

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Agenda

- About Baidu Mobile and Search Application
- The Architecture of Baidu Mobile
- Mobile Search Basic
- Mobile Search Enhancement

About Baidu Mobile and Search Application

Features of Baidu Mobile :

- Search => Text , Image , Voice
- Browse => WebApp and Native UI
- Cards => Entries of everything
- O2O => Connect People to Service
- Payment => Service Closed-loop

MAU of Baidu Mobile Application
> US population

Cards

Plug-in

Service Close-Loop

Search (Text , Image , Voice)

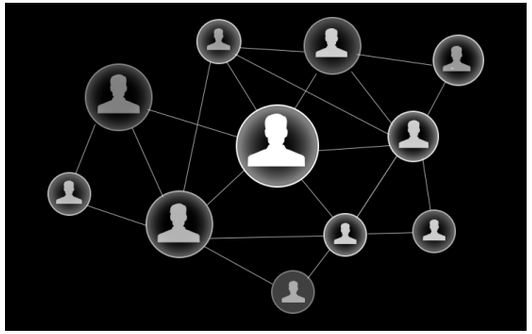
About Baidu Mobile and Search Application

Different Search

Vertical Field
Novel Video News

O2O

Crowd Segmentation



Social Networking
Services

About Baidu Mobile and Search Application

User Experience

Compatible

Accumulation

Multifunction On Client

Big Data

High-Concurrency

Monitor

Respond Quickly

Search On Mobile Application

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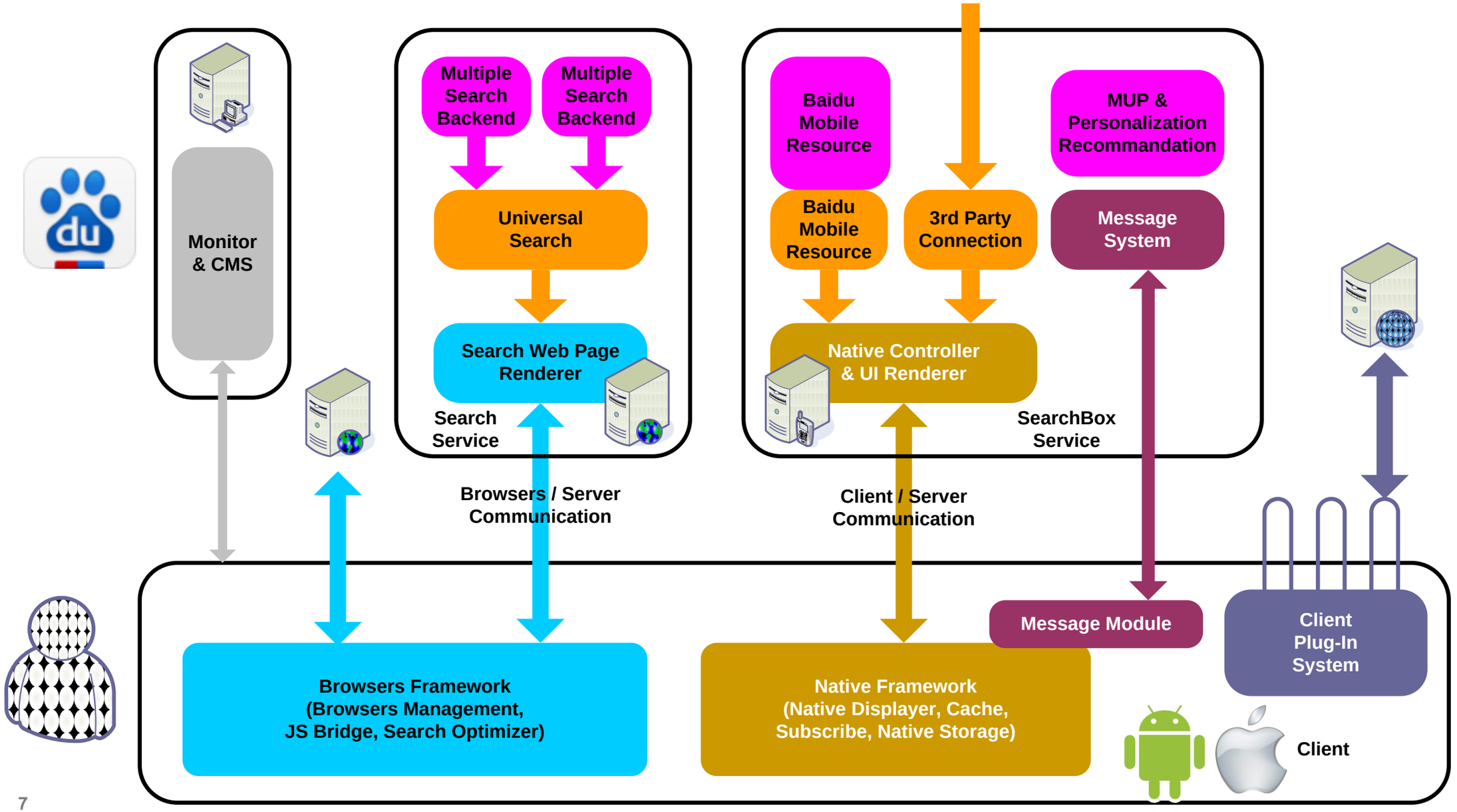
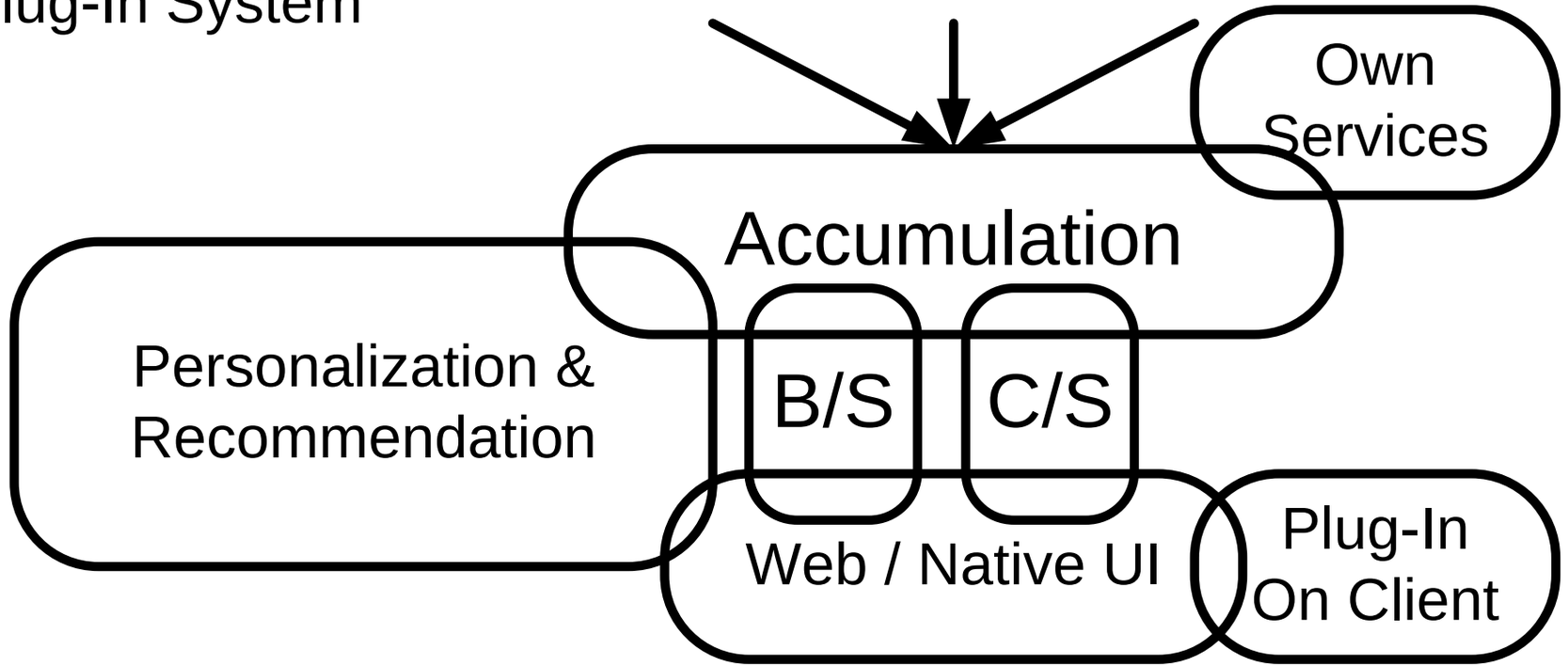
The Architecture of Baidu Mobile



The Architecture of Baidu Mobile

- Enhanced Browser and WebApp —— B/S Mode
- Super Client-Server Application —— C/S Mode
- Accumulation of Information and Service
- Personalization And Recommendation
- Client Plug-In System



Enhanced Browser and Web App

Baidu Mobile Application can work as enhanced browser.
There is standard WebApp and special WebApp.

- Supporting standard WebApp.
- Some UI features on Browser
- Additional Web APIs for hybrid
- Search Result Page as Core content
- Special WebApp as Own UI

Novel

Video

CardCenter

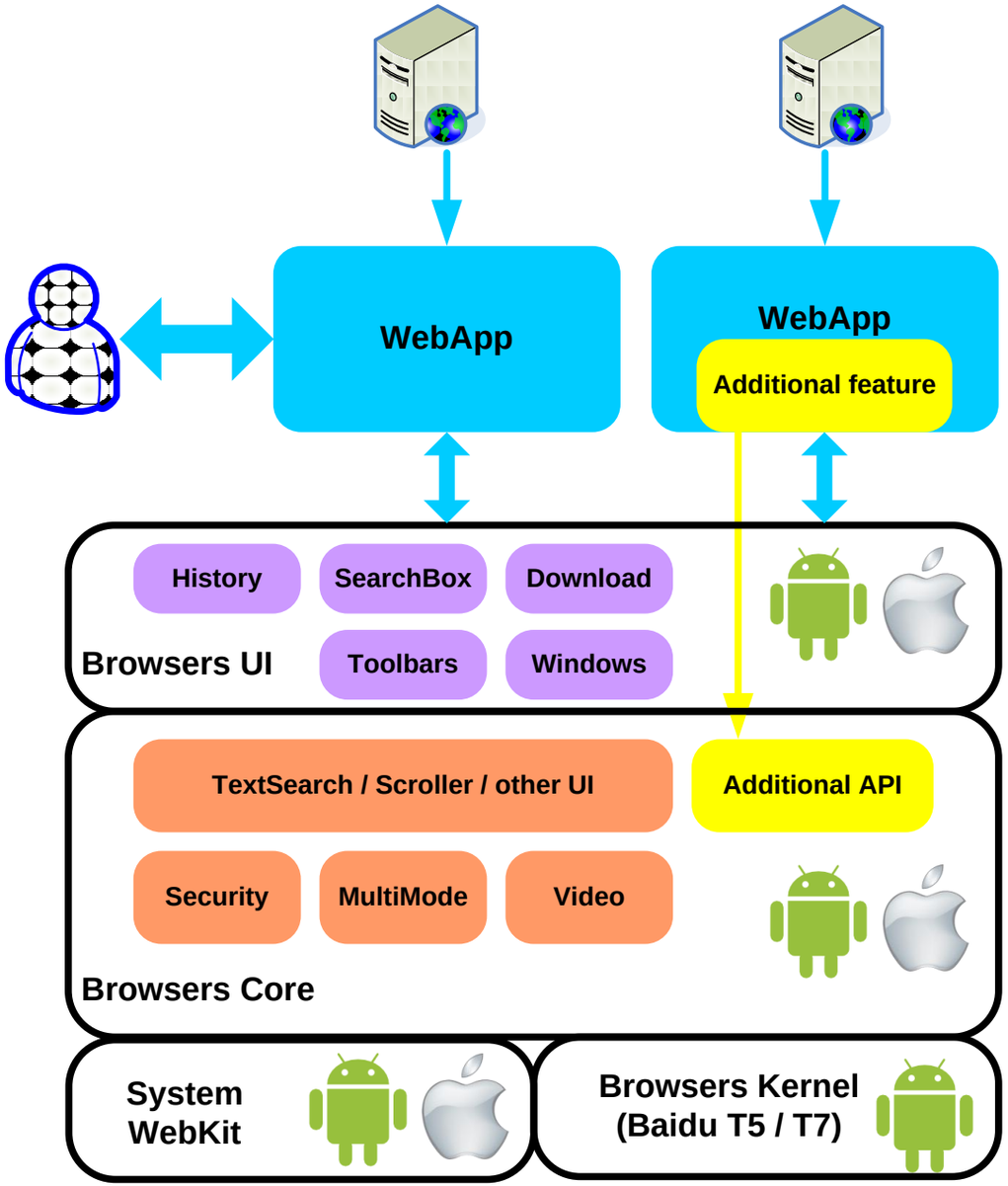
Enhanced Browser and Web App

Browser of Baidu Mobile :

- Baidu T5/T7 Kernel for Android.
- Browsers Core with additional modules
- CloudaJS WebAPI
- Different Browsers UI for different situations

WebApp of Baidu Mobile:

- Search Result Page is optimized.
- Internal WebApp can use additional module to build the application UI.
- Some external O2O WebApp (@) can also use additional WebAPI and run in different UI



Super Client-Server Application

Baidu Mobile is a super application. The main design conception is cross-platform template. Client-Server mode is a basic of UI mechanism of Baidu Mobile.

WebApp Conception → **reuse** → **Client /Server UI Implementation**

Performance

Compatibility and Expansibility

Controllability

Super Client-Server Application：Performance

We consider two aspects of Client-Server application:

- Capability of Server (CPU , Memory , IO)
- User Experience (data channel , display speed)

Optimizations Points:

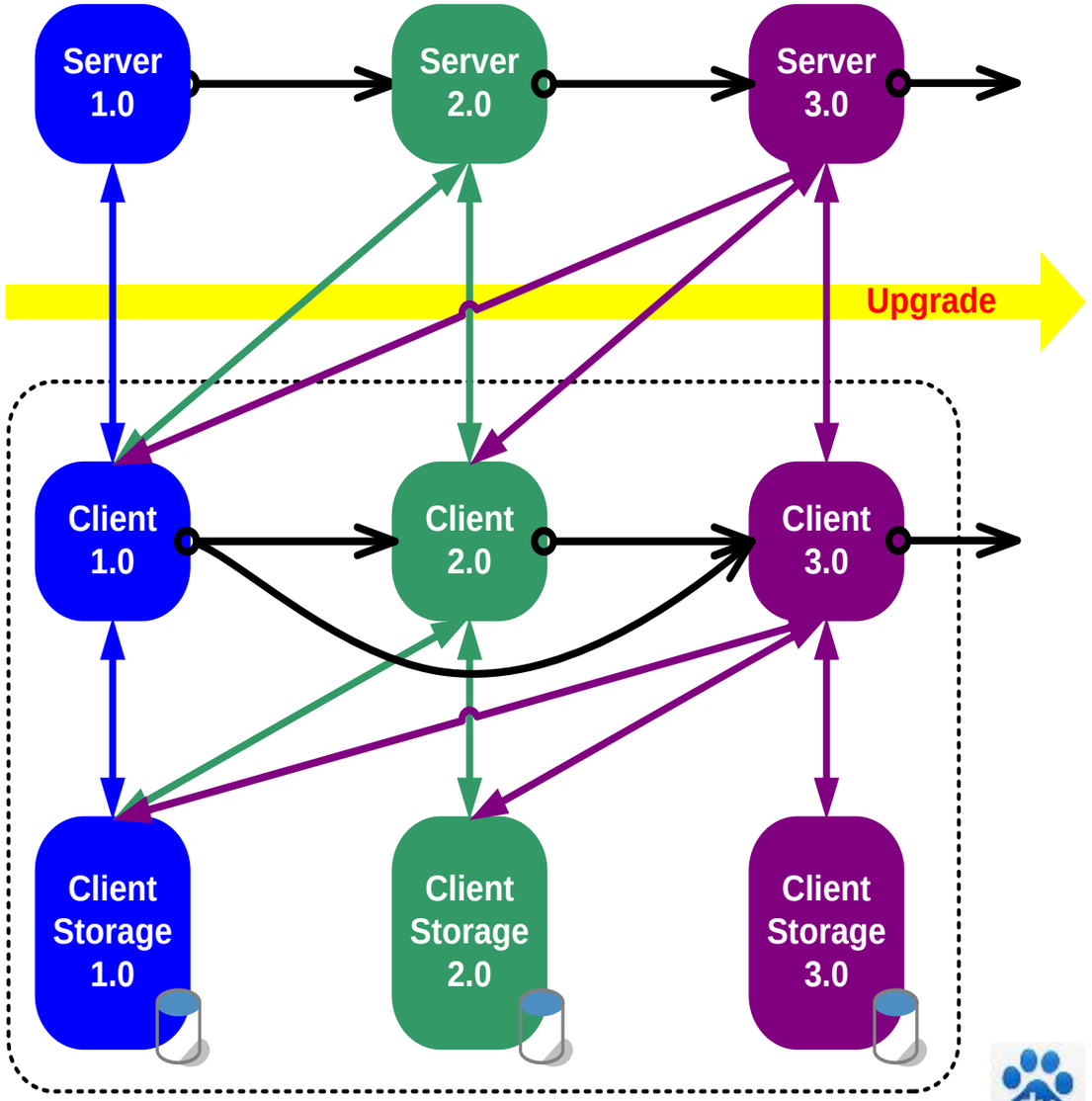
- Server Page Cache => Separate / Force Time / Permutation & Combination
- Asynchronous Loader and Displayer => Image Loader, display sequence
- Request Merging => JSON data , protocol buffer
- Cache Negotiation => Client stores data cache and use the return code ,Server judges both timestamp and data signature

Data Format | Server Cache | Protocol Cache | Download Method | Client Storage | Dynamic Code

Super Client-Server Application : Compatibility and Expansibility

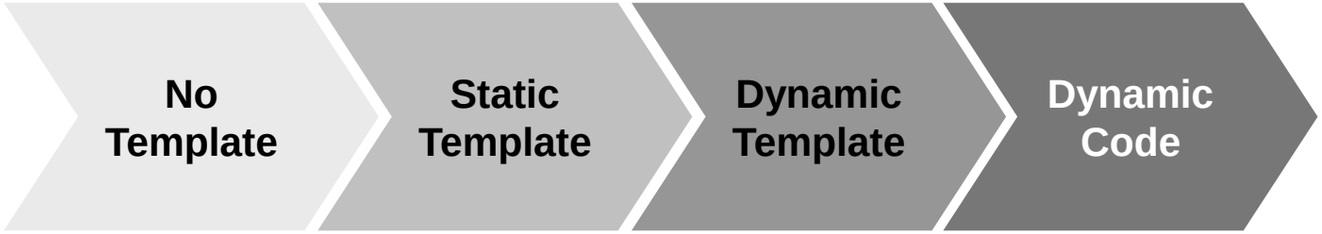
There is program on Client side and Complex Client Storage. Compatibility and expansibility are core conception of CS Mode application.

- Code policy
  - Forwards compatible on Client Side
  - Backward compatible on Server Side
- Cache Policy
  - Distributed Cache Adjustment
  - Cache on Client
- Storage Policy
  - Persistent Storage Optimization
  - Storage on Client



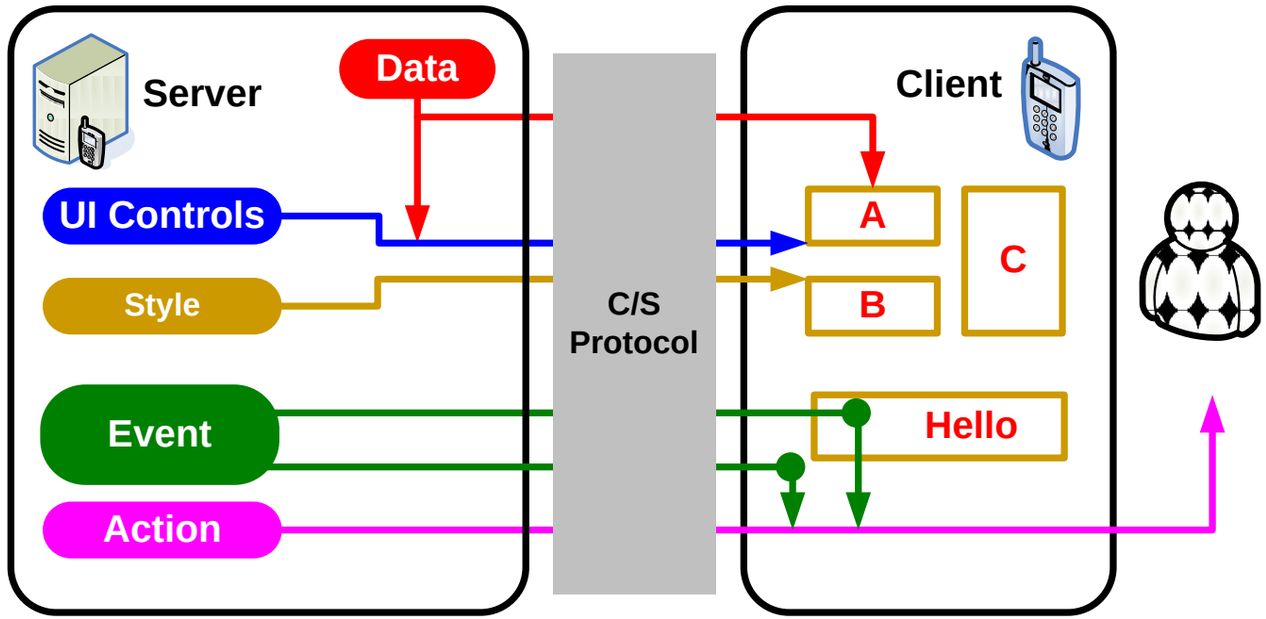
Super Client-Server Application ： Controllability

The distribution of Mobile Application is not easy. When we want to update the content to user, the mobile application cannot be updated immediately.



Powerful controllability:

- Several template methods
- Content : Data, UI , Behavior
- 2 sides : Flexibility vs Complexity
- Customer Schema and Browsers ?



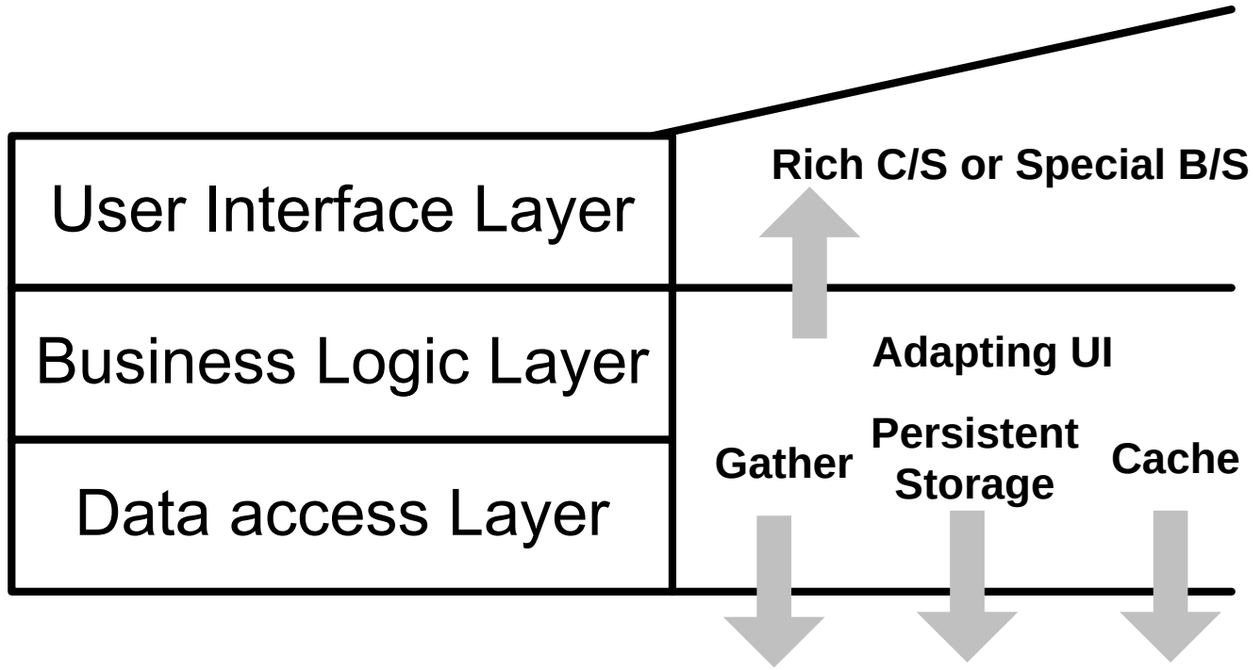
Accumulation of Information and Services

Information and services are from own resource and upstream service.

- Information : news , video , novel , gallery and so on.
- Services: lots of O2O support

The Resource of Baidu Mobile include:

- Multiple high concurrency business
- Resource connectivity center
- O2O business support
- Connecting to the World



Accumulation of Information and Service

Offline System and Storage

Cache System

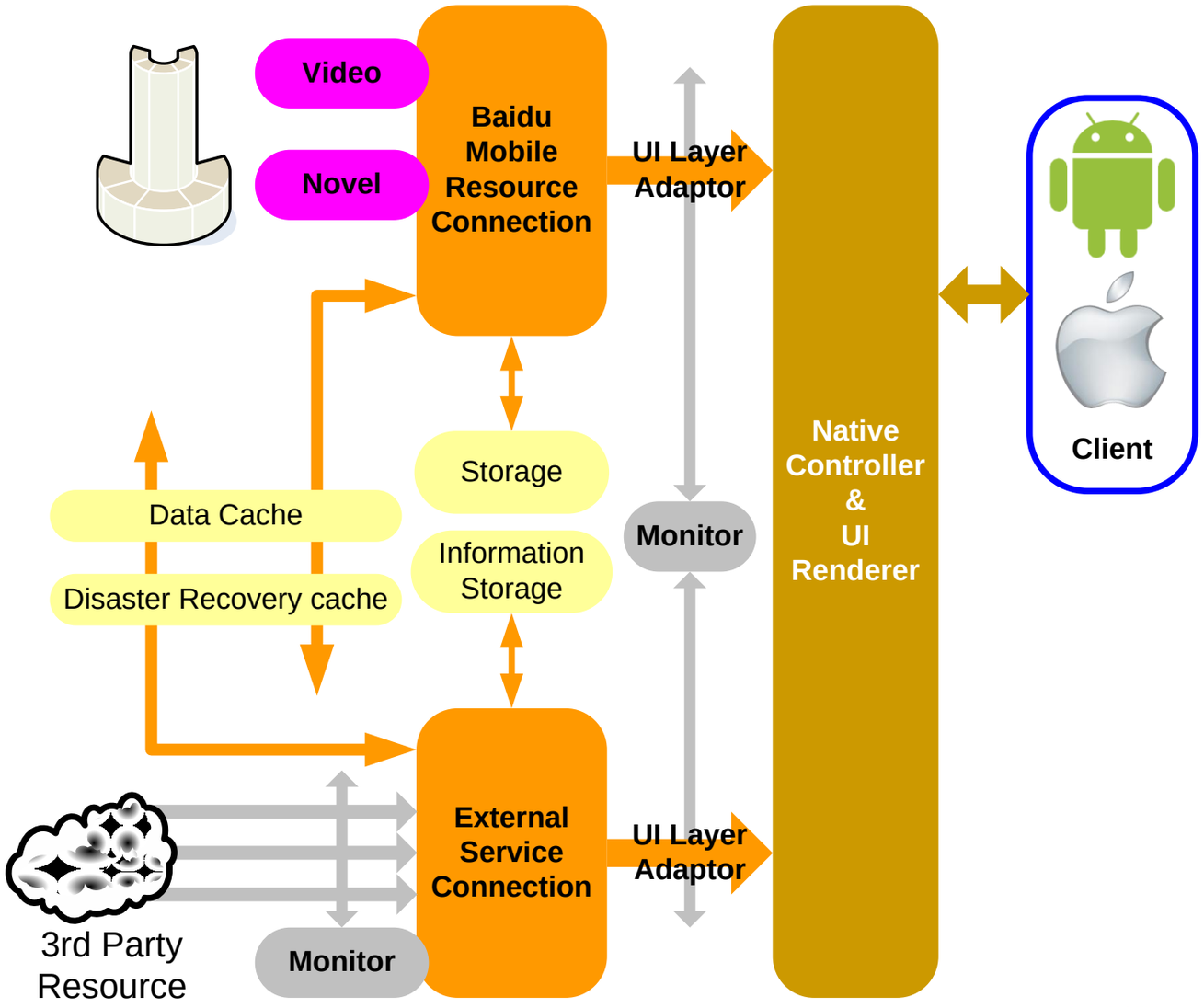
- Data cache
- Disaster Recovery cache

Adapting UI Layer

- Totally Different Resources
- Fill the template
- Abstract the schema

Resource Management

- Resource Switcher and MAP
- Resource Monitor



Personalization And Recommendation

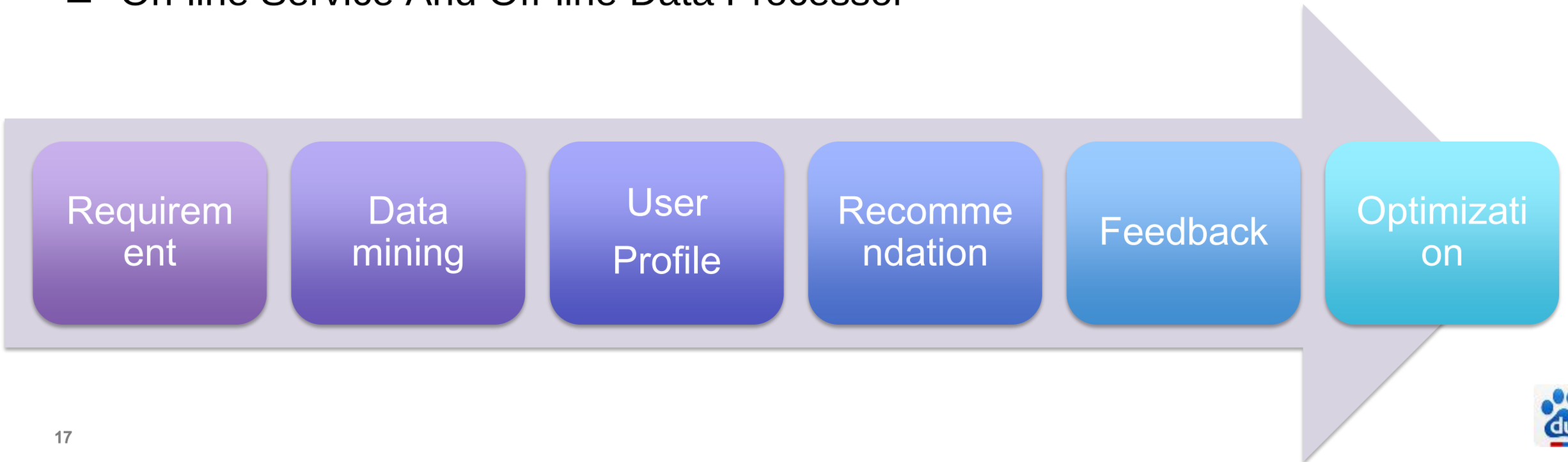
The goal is different services for different users.

The main points are:

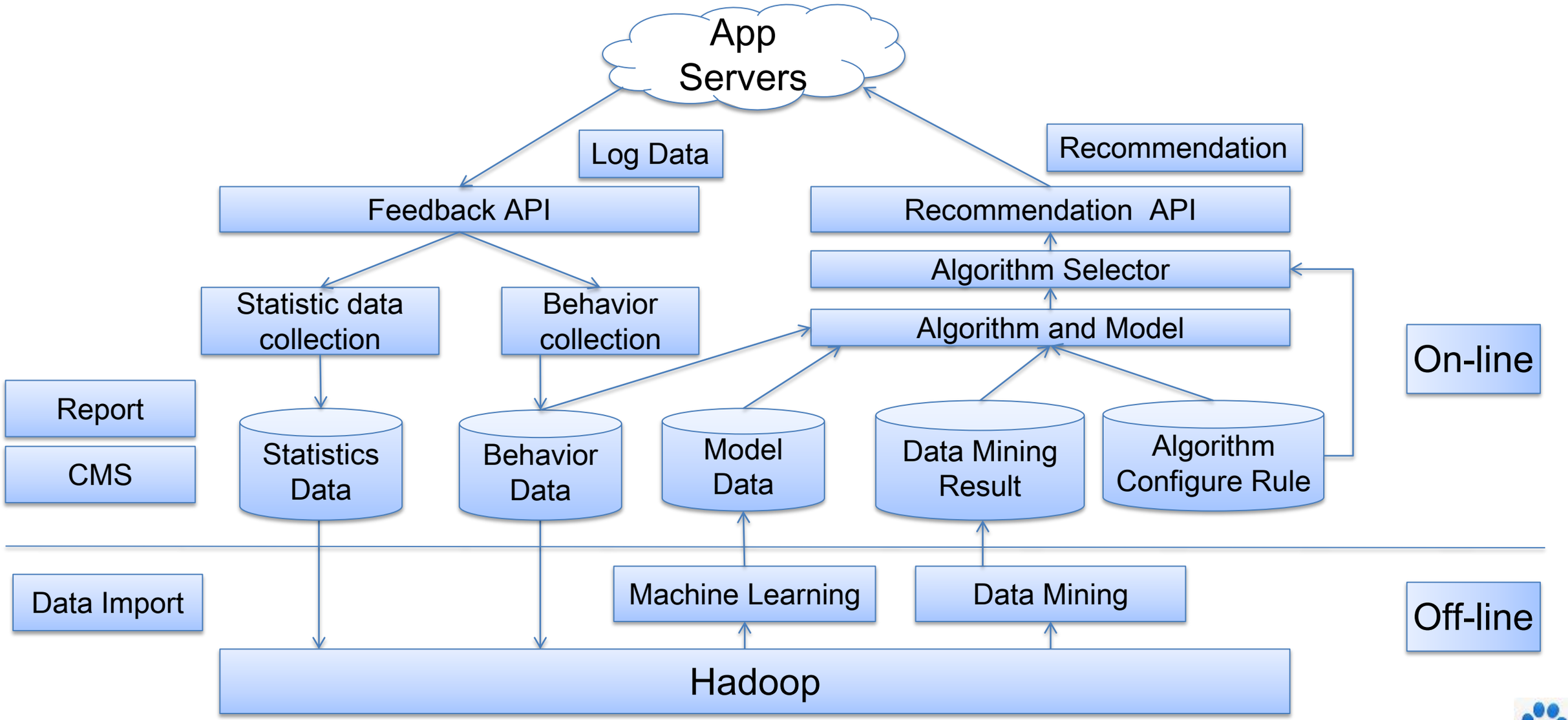
- Storage and Management of big data
- Mobile User Profile
- On-line Service And Off-line Data Processor

User Behavior

User Scene



Personalization And Recommendation



Client Plug-in System

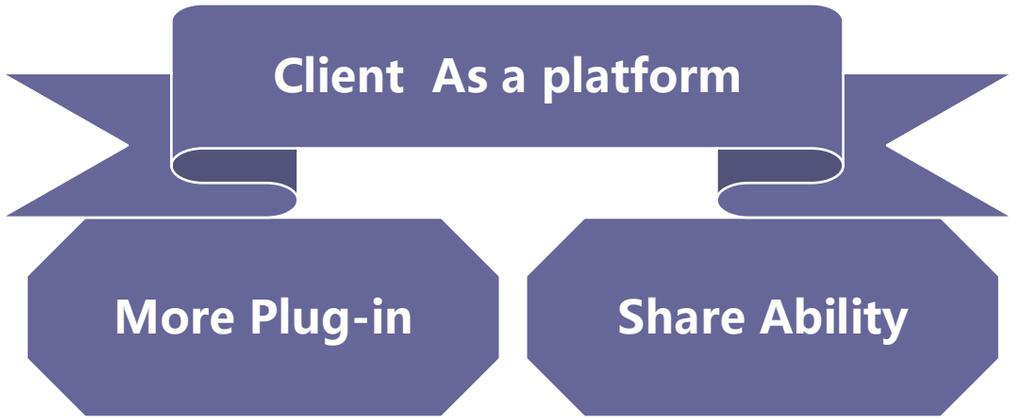
Client Plug-in System make Baidu Mobile have multiple functions.

Plug-in feature:

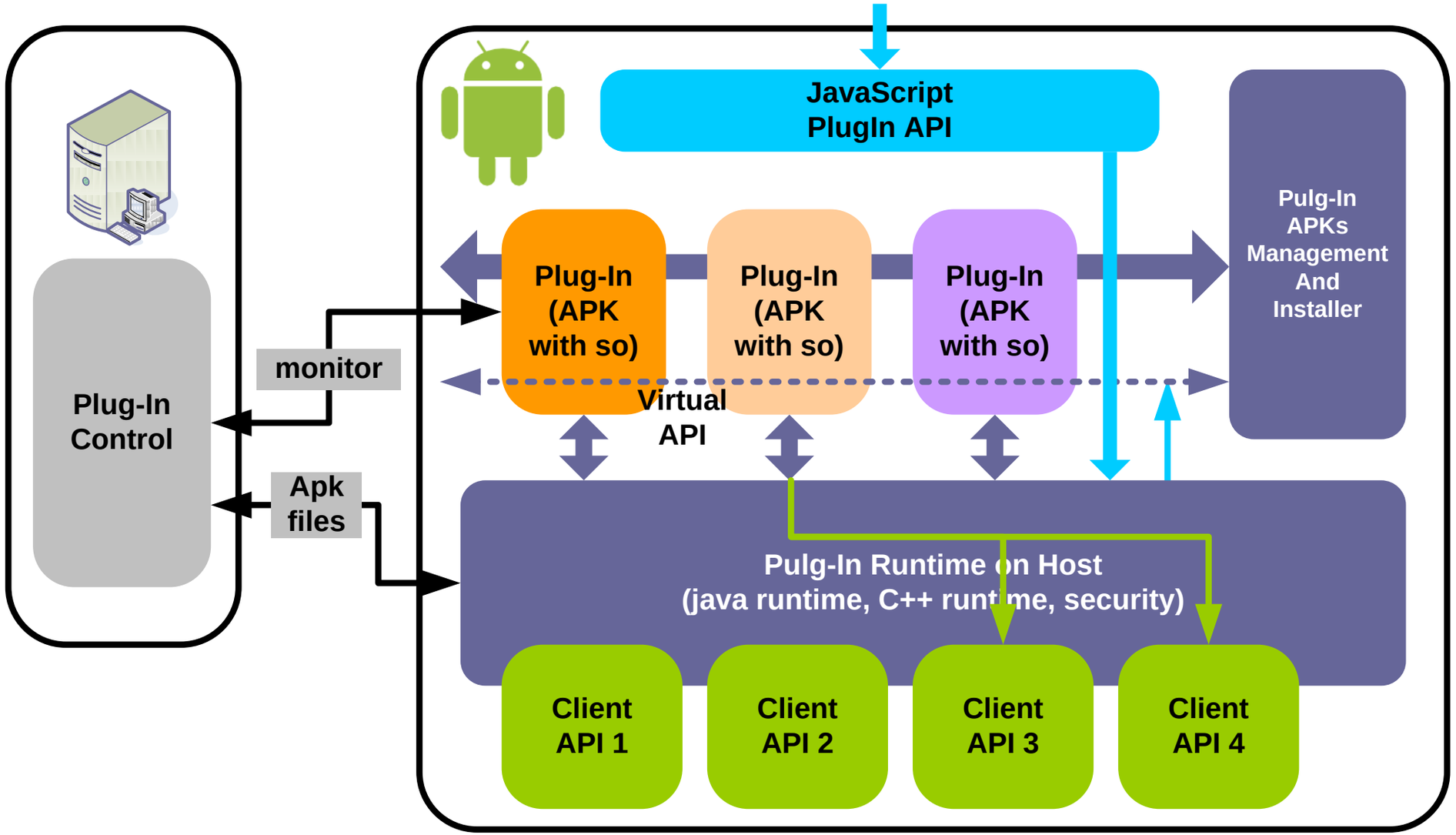
- Dynamic and Static Plug-in
- Common Host API for Plug-Ins
- Virtual API between Plug-Ins
- JavaScript PlugIn API for WebApp

Some capabilities for PlugIn:

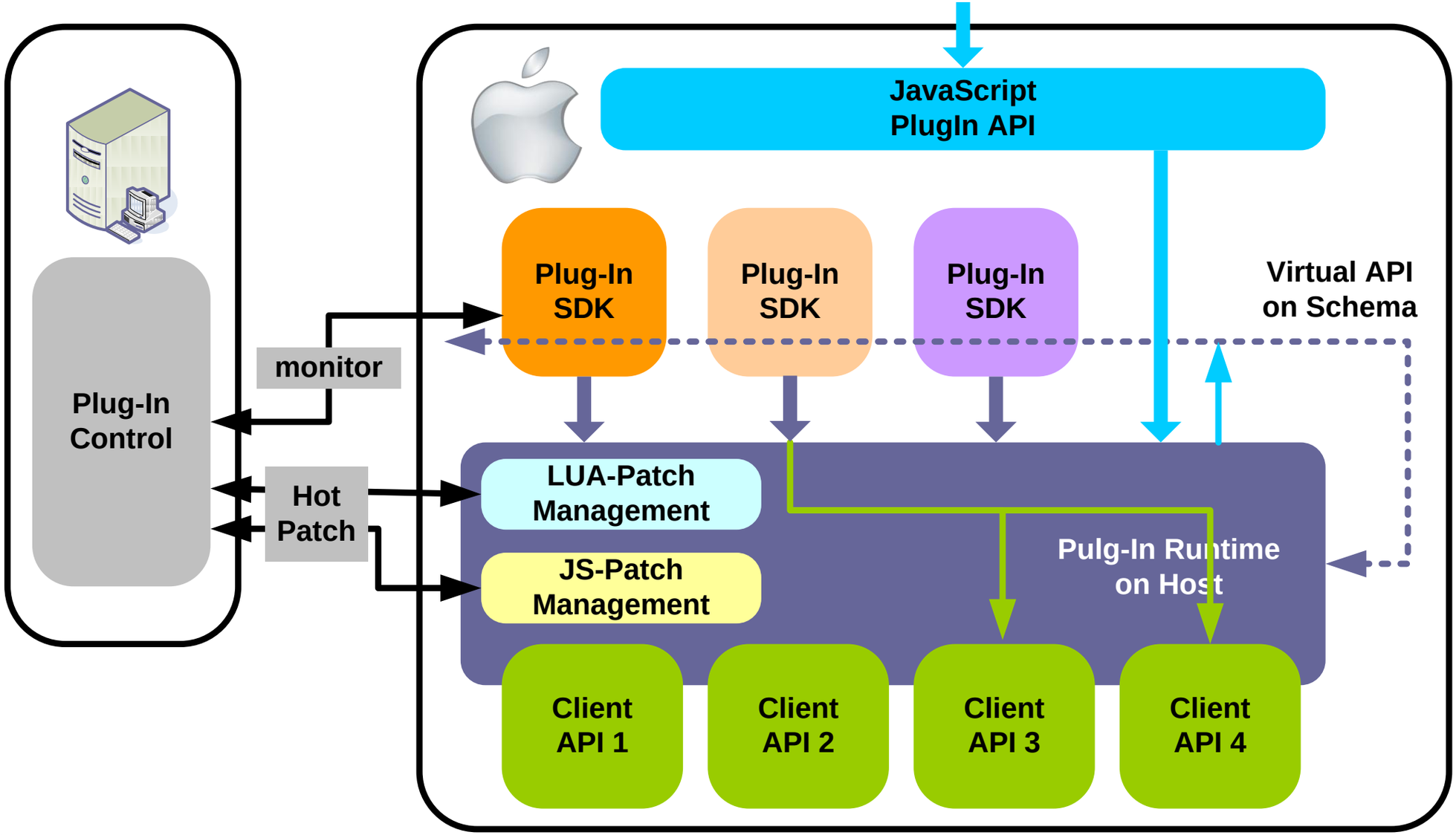
- Account
- Share
- Pay
- Cards
- Some UIs
- ……



Client Plug-in System: Android



Client Plug-in System: iPhone



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Mobile Search Basic

Difficulties on Mobile

- Adapt screens
- Adapt networks
- Adapt devices

Differences on Mobile

- UI Behavior
- User Scene

Features on Mobile

- Enhance the display for results
- Media-Rich Search

(Voice Search, Image Search)

Chrome

Baidu Browser

Baidu Mobile

Page Display Layer

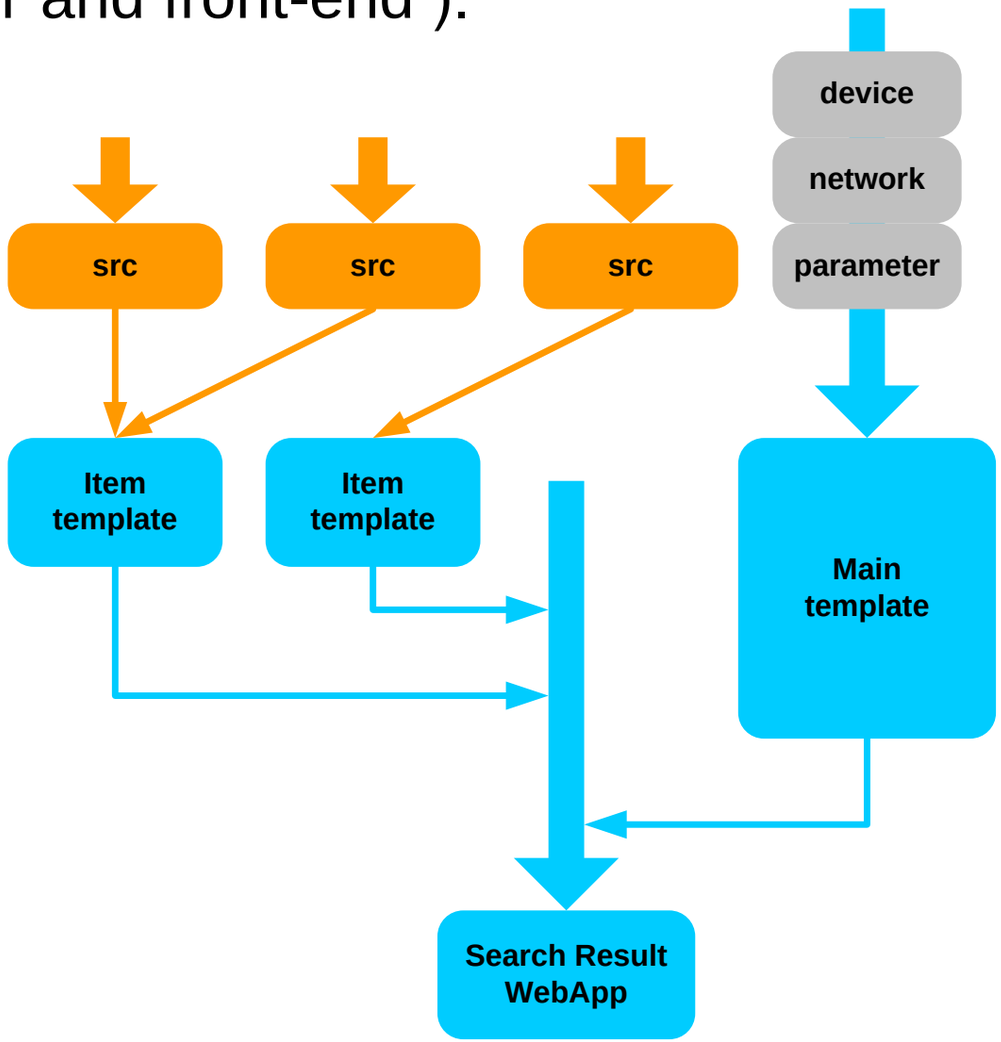
Page Display Layer works as container (server and front-end).

Main Template:

- Depend on Devices, network, parameter
- Server => Distinguish difference
- JavaScript => Use host ability

Item Template:

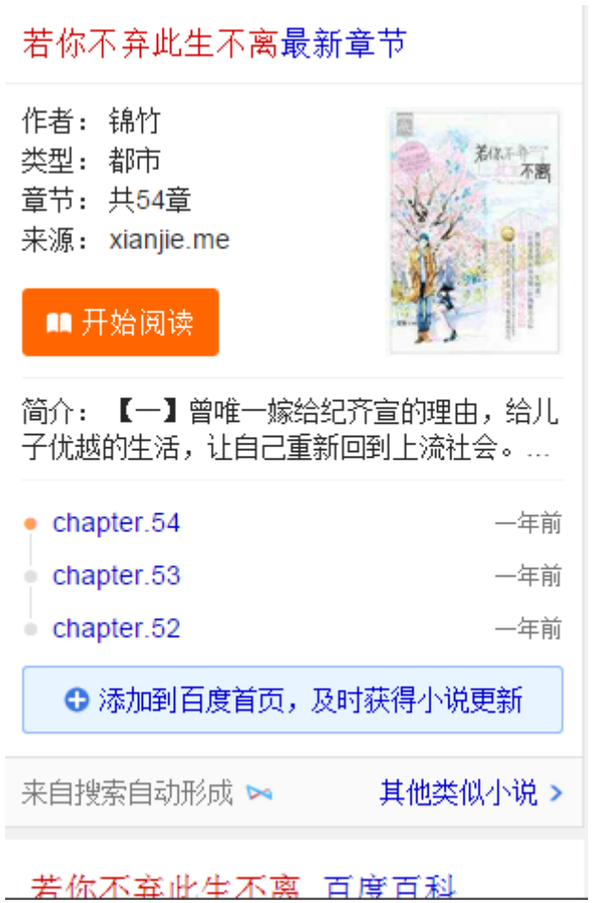
- Template + Resource => Display Item
- Only answer => highlight result
- Weak Item => for secondary order item
- Use behavior => feedback to order



Mobile Contents

The points for mobile contents:

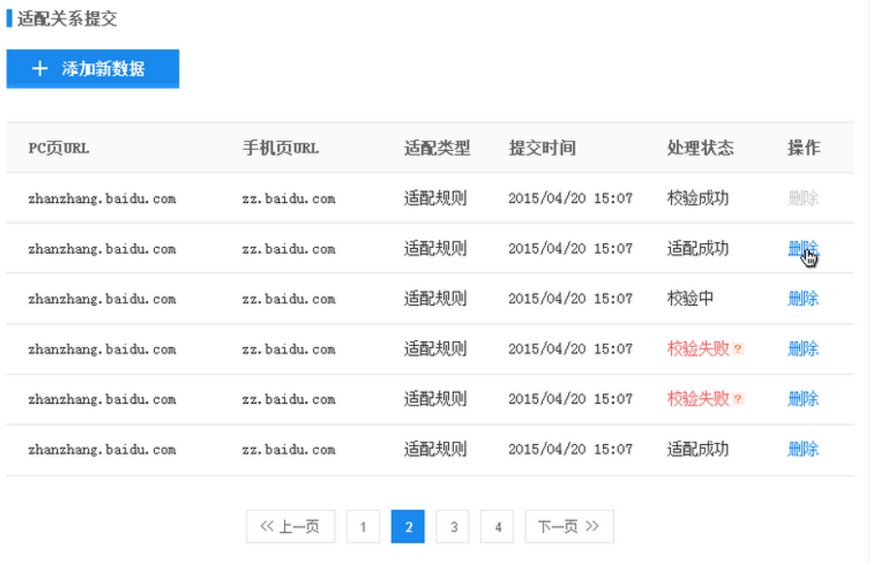
- Mobile device type and ability
  => different content
- When there is a mobile query request from mobile device. It will provide:
  - Mobile original content
  - Mobile transcoding content
- There is a rule for mapping the Mobile H5 Resource and PC resource.
- H5 Resource inherits the link relationship and right information of PC.



Demand Analysis

The points of Demand Analysis on Mobile Device:

- According to the orientation of query, recognize the user needs and find the corresponding standard category
- According to the corresponding category in the field of information, extract the specific tag field to support detailed query and selection of vertical resource ,
- Provide the internal subclass, and give the importance of distinguishing



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How to Enhance Searching on Mobile Application

Powerful Interactive

Information Closed-Loop

Communic ation on Search

Several Technical points For Business Feature

Connect Web Page and Native UI
Mechanism First , Vertical Business Later
Change one point => extend to global
Reserve the content and rank

JS-Bridge capability @ Search Result Page

Native UI capability @ Browsers

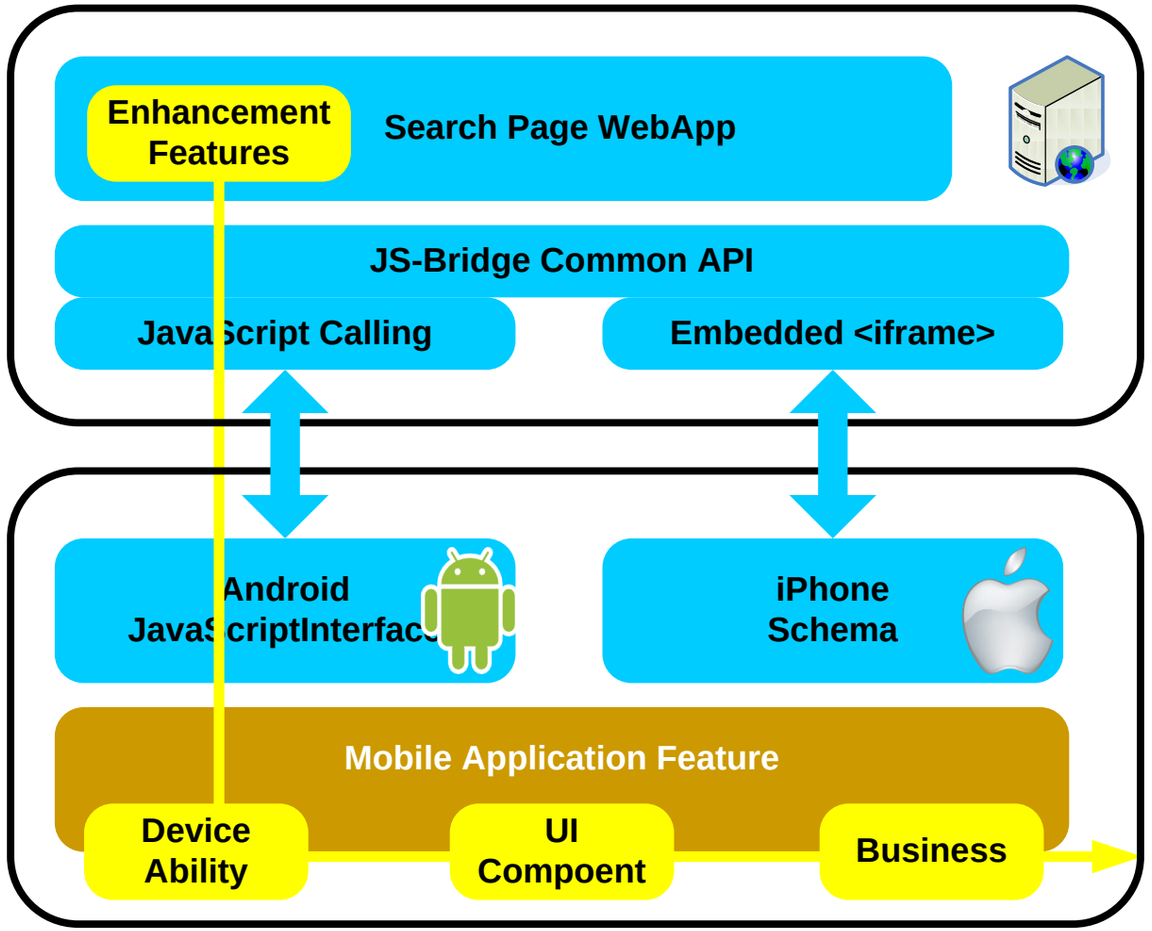
Message capability @ Mobile Client

Technical Core-Competitiveness

JS-Bridge capability @ Search Result Page

JS-Bridge capability => hybrid WebApp.

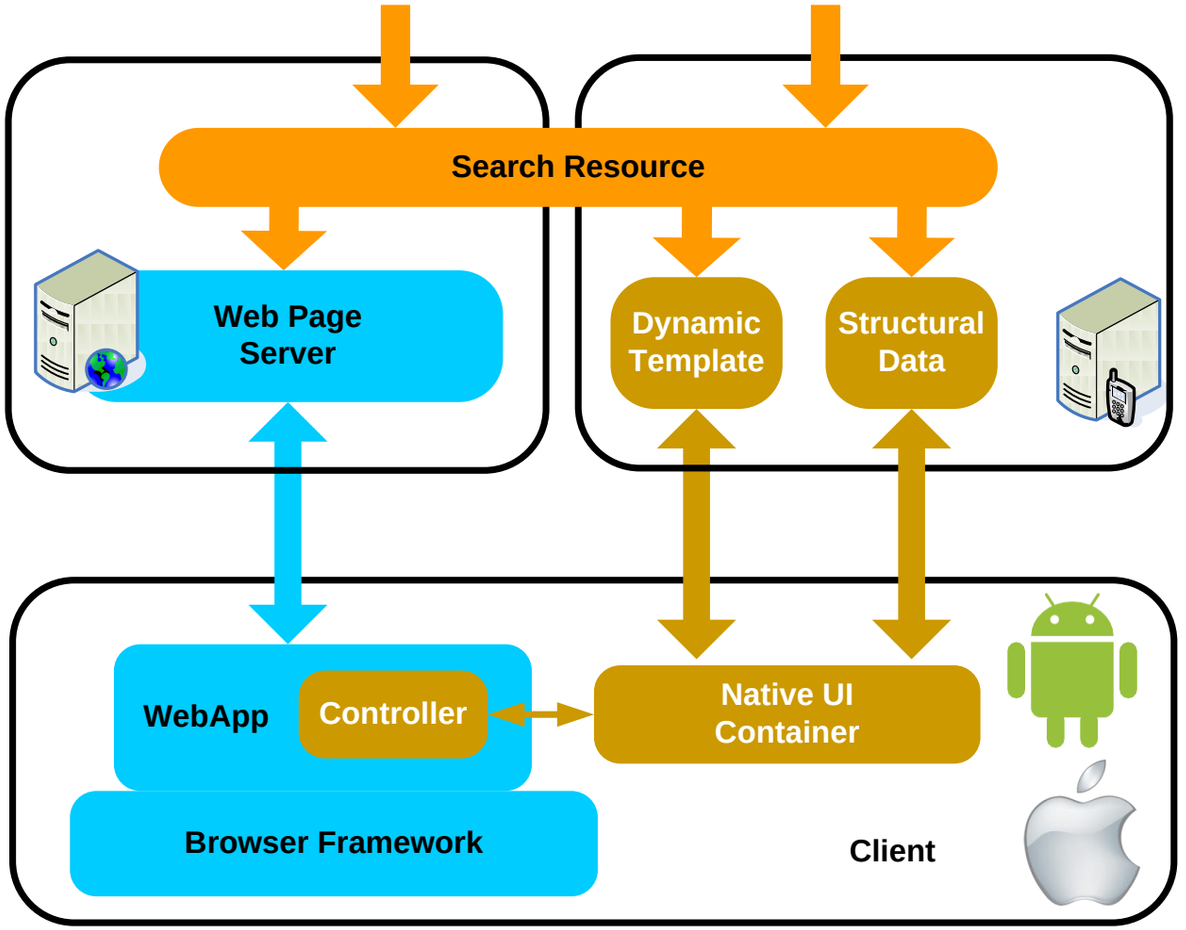
- Use native device or system ability
- Use the additional native UI
- Use additional API for special business
- JS-Bridge module works as separated component
- JS-Bridge can work with the every result item component
- Target also includes the landing page



Native UI capability @ Browsers

Native UI with browsers framework:

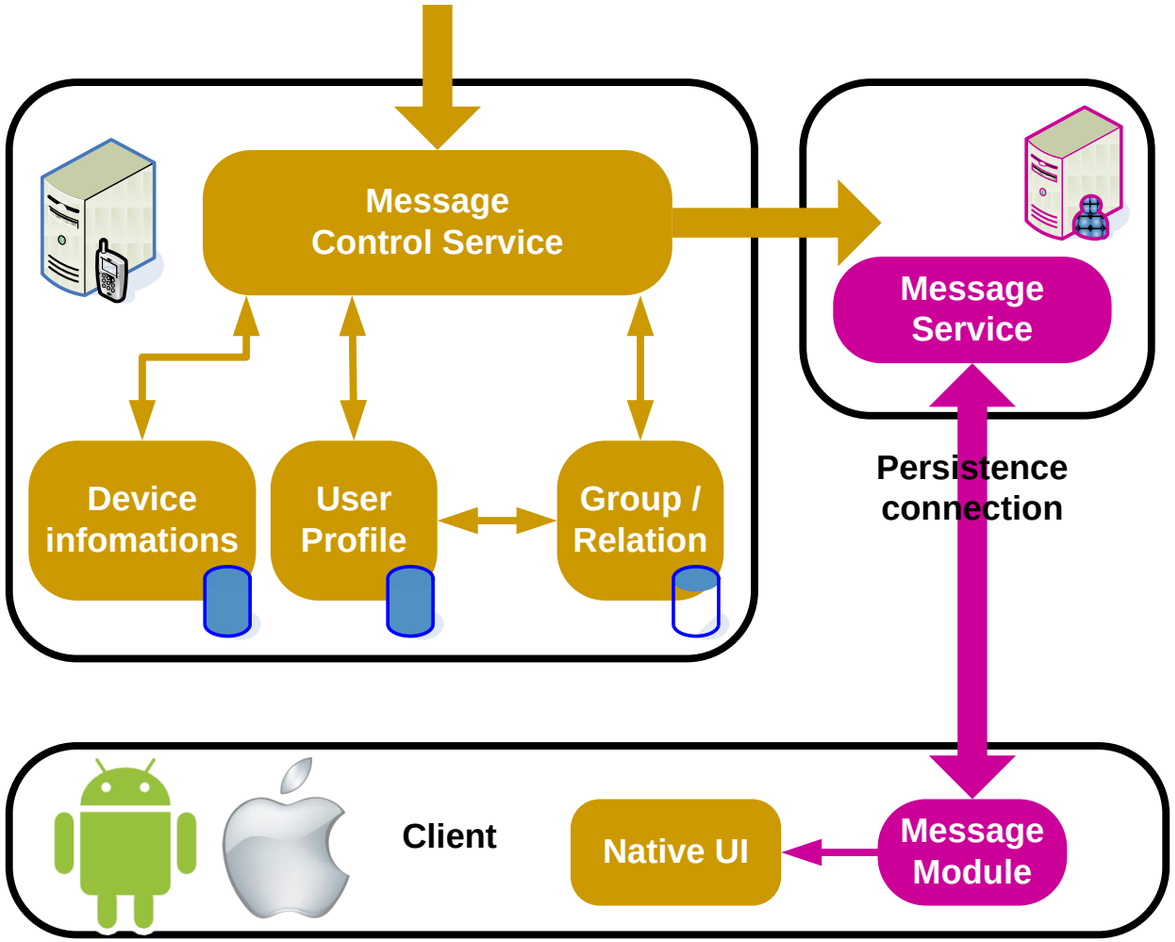
- Flexible as Web
- High performance
- Support Gesture
- Support the general browsers behavior(Back, Forward, Share, URL)
- Support Multi-Windows with browsers
- Maintain the state machine in webpage



Message capability @ Mobile Client

Message is special ability on Mobile Client:

- Persistence connection between Client and Server
- Client notification
- User Profile: from login users
- Device Profile: from mobile devices
- Data Collection: build the relations
- User Behavior: build the groups



Powerful Interactive

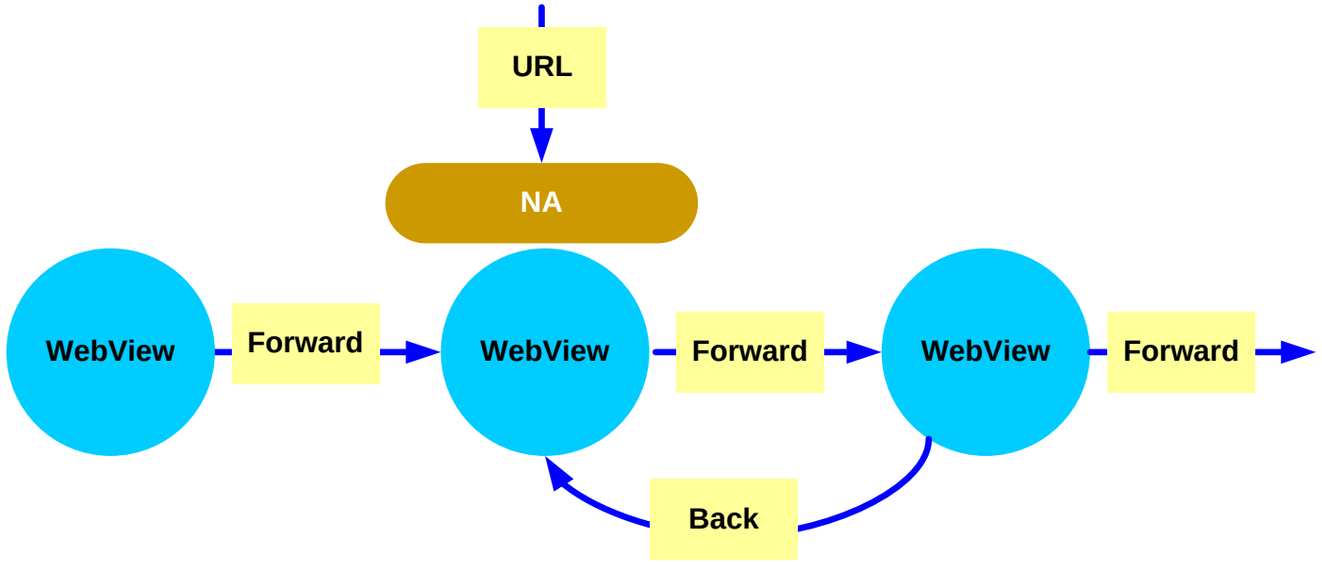
Features:

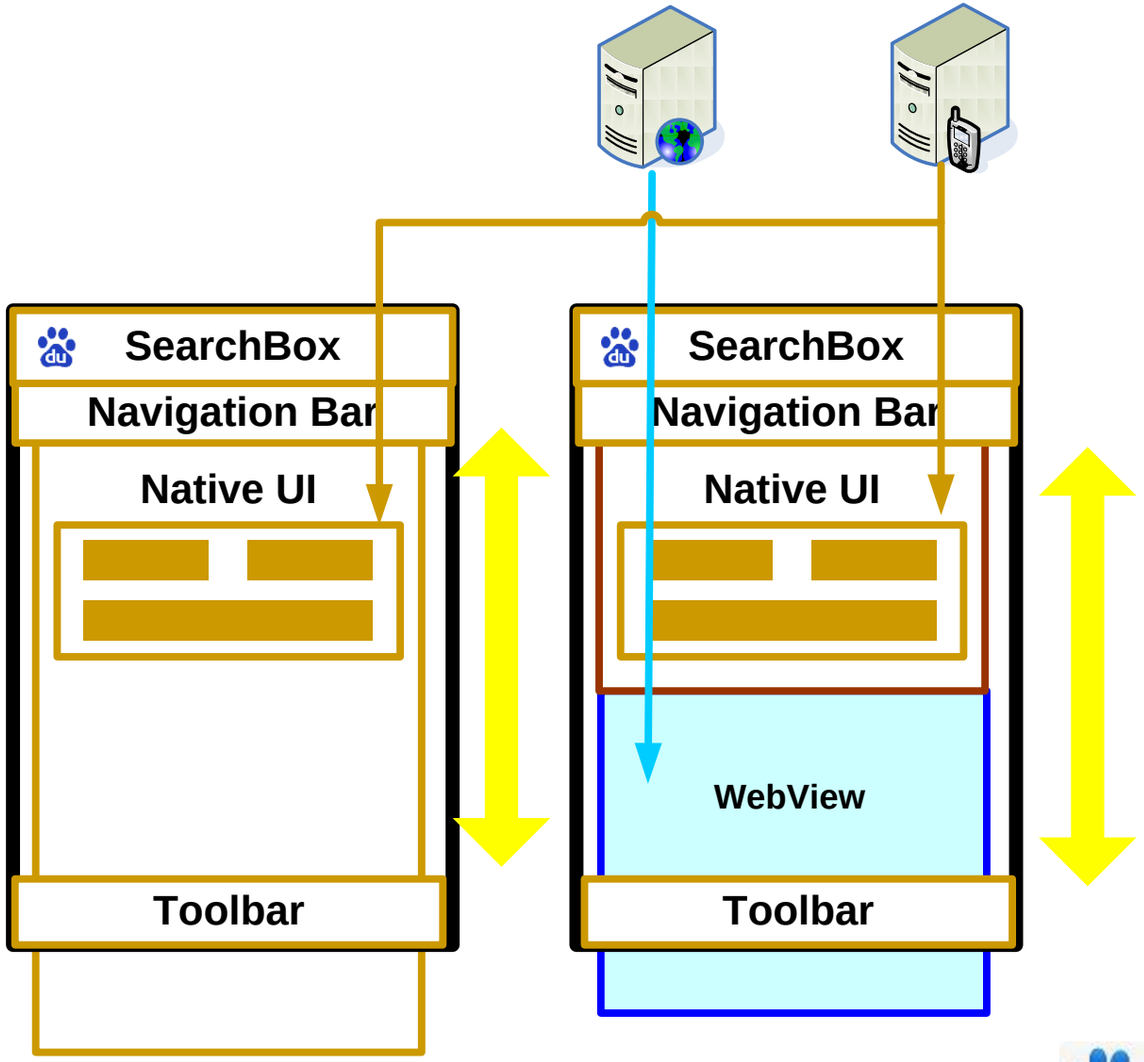
- Search Result as Application
- Powerful UI rather than web app
- Following the browsers behaviors
- Expanded Status for O2O
- Closed Status for other result

Powerful Interactive

The technical points:

- Dynamic template of Client / Server
- Associated behaviors and animation of Native UI and WebView
- History and re-entry of Web Pages





Information closed-loop

Features:

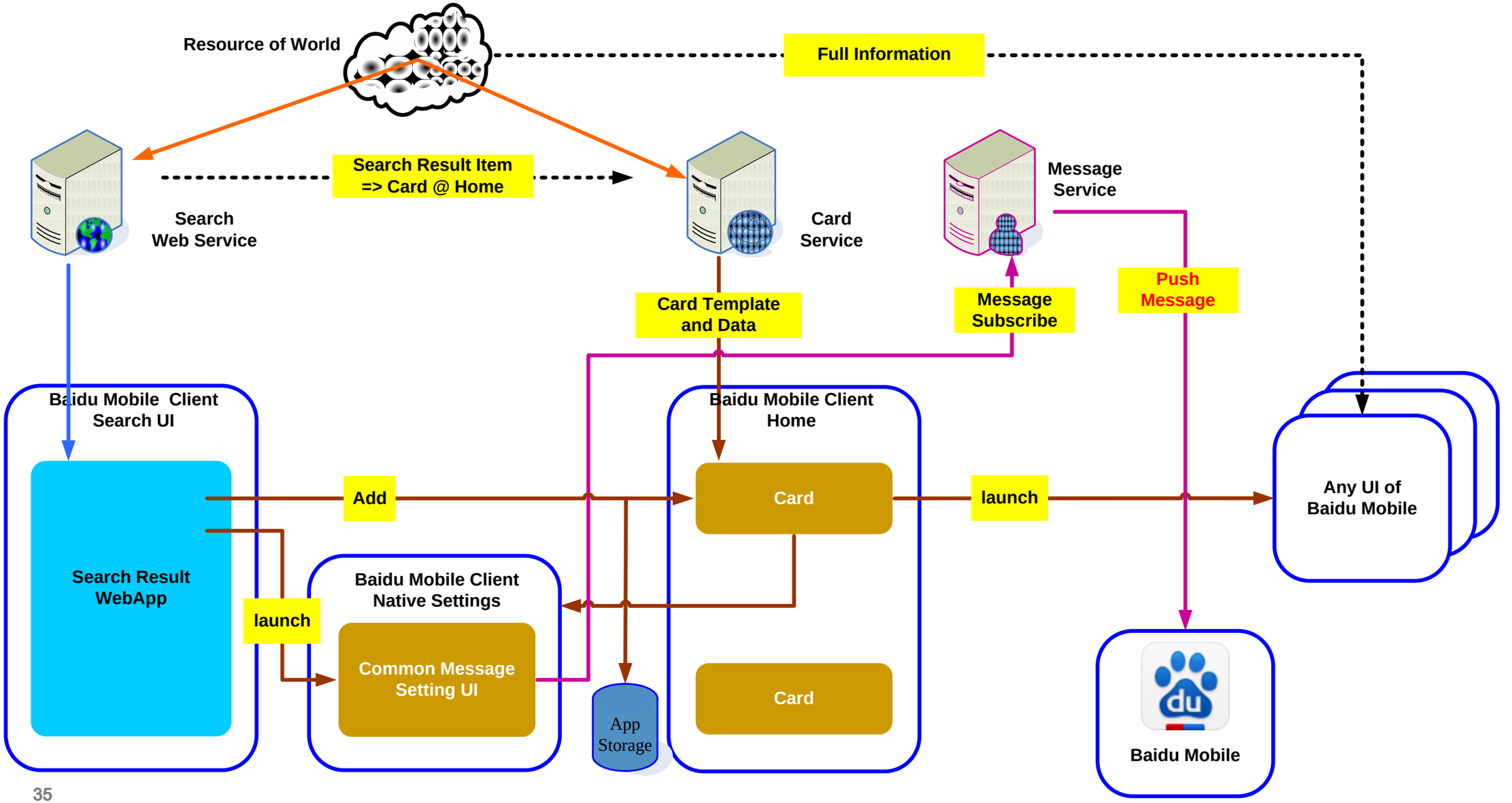
- Result => become a Card
- Card => show the information directly
- Card action => conduct user to any where
- Card => attach to a reminding
- Reminding => trigger some message
- Messages => back to the application

Search Result

Cards @ Home

Remind Settings

Information closed-loop



Communication on Search

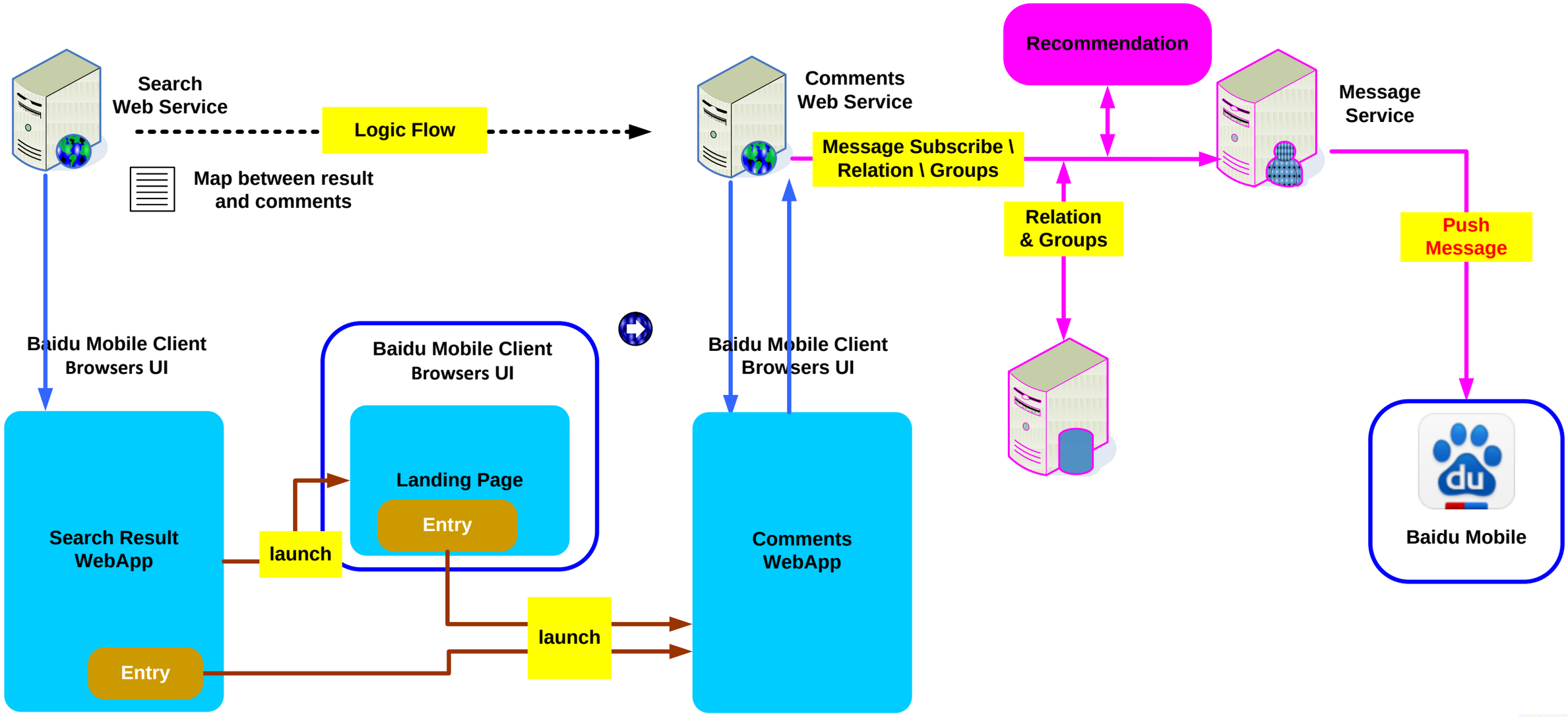
Features:

- Result => attach to comments entry
- The comments => attract users to communicate
- Users => Setup relation
- Users => Gather as groups
- User characters => be dug
- User information => Generate some messages
- Messages => a notification to users

Search Result

Comment Website

Communication on Search



Thanks!