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TOWARDS A SMART CLOUD GATE FOR SMART DEVICES

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Technology)

Introduction

2

CLOUD SPECTATOR **CLOUD COMPUTING** 6 of the most interesting, tossed-around industry statistics that you have to know.

\$150 BILLION

The size of the cloud computing market by 2013, as predicted by Gartner. Merrill Lynch gives similar estimates, predicting a growth to **\$160 billion** by 2013.

\$750 MILLION
The amount Amazon.com's AWS expects to earn in 2011, as predicted by UBS analysts.

54%

SECURITY: THE TOP CONCERN
for migrating applications to the cloud, according to a very recent LinkedIn[™] survey out of 7052 participants. GoGrid conducted a similar survey and also concluded Security as a top concern for migrating.

57% DISAGREE
A 2010 survey by Mimecast discovered 57% of respondents agreed cloud computing actually improved their security.

7/10

A study by Mimecast in 2010 discovered that **7 out of 10** companies using cloud services are willing to and will move new applications to the cloud. Many would have done so by 2011.

60% **VIRTUALIZATION**

By 2014, approximately **60%** of server workloads will be virtualized, according to predictions from Gartner. Compare that to **12%** of server workloads virtualized in 2008.

FOR MORE CLOUD COMPUTING INFORMATION GO TO [HTTP://WWW.CLOUDSPECTATOR.COM](http://www.cloudspectator.com)

Visions

3

- Information at your fingertip **any Where any Time.**
- provide ubiquitous PC-like functionality to mobile users.
- Making mobile devices efficient by extending battery life, storage capacity, etc...

Mobile Cloud Computing as a Solution

4

- Mobile Cloud computing (MCC) has been introduced to be a potential technology for mobile services.
- MCC integrates the Cloud computing into the mobile environment and overcomes obstacles related to their performance.



Cloud Computing

5

- ❑ Shared pool of configurable computing resources
- ❑ On-demand network access
- ❑ Provisioned by the Service Provider



Cloud Models

6



Public Cloud

- The Cloud infrastructure is provisioned for open use by the general public



Private Cloud

- The Cloud infrastructure is provisioned for exclusive use by a single organization comprising multiple consumers



Community Cloud

- The Cloud infrastructure is provisioned for exclusive use by a specific community of consumers from organizations that have shared concerns



Hybride Cloud

- The Cloud infrastructure is a composition of two or more distinct cloud infrastructures

Cloud Service Model



SAAS
Software
as a Service

- Email
- CRM
- Collaborative
- ERP

CONSUME



PAAS
Platform
as a Service

- Application Development
- Decision Support
- Web
- Streaming

BUILD ON IT



IAAS
Infrastructure
as a Service

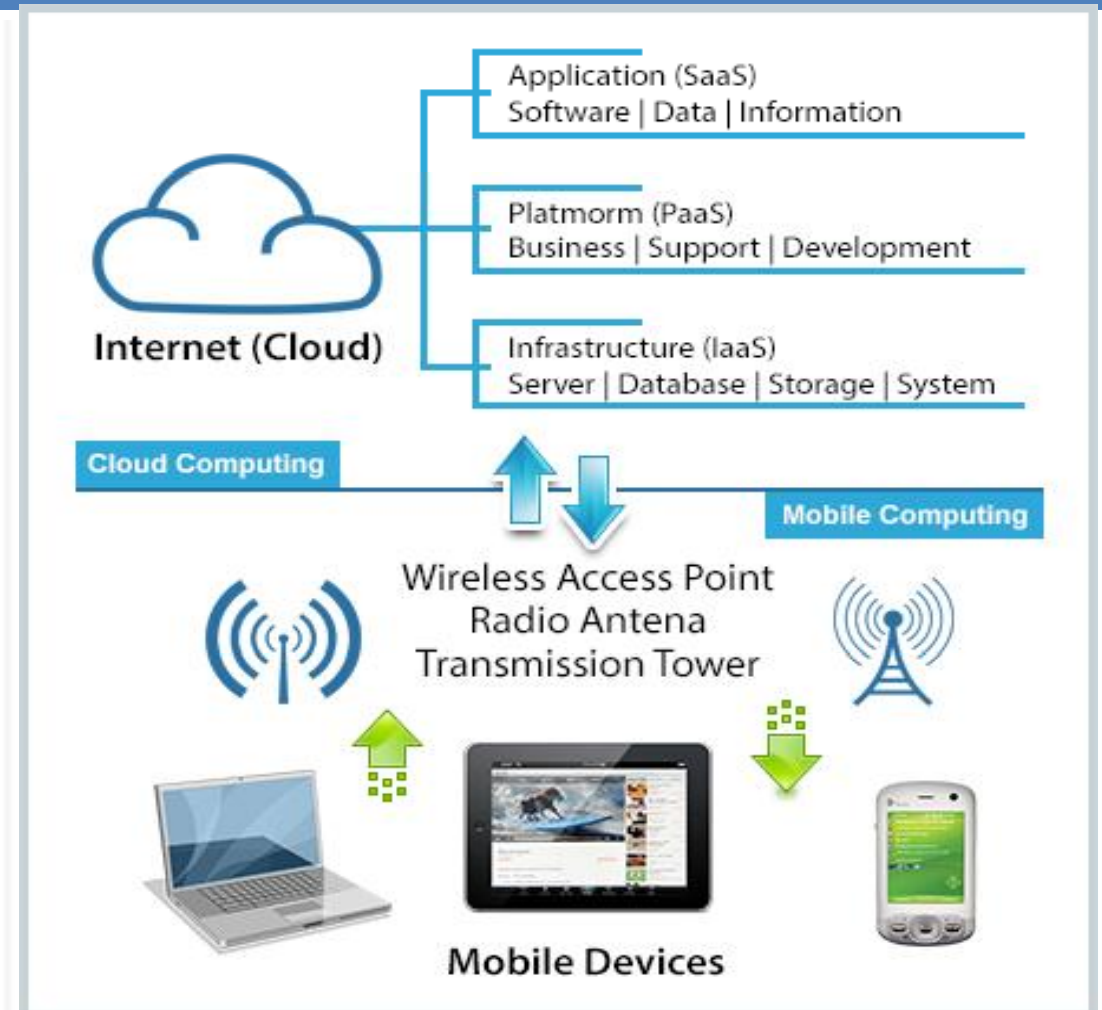
- Caching
- Legacy
- Networking
- Security
- File
- Technical
- System Mgmt

MIGRATE TO IT

Mobile Cloud computing

8

- Mobile Cloud Computing at its simplest refers to an infrastructure where both the data storage and the data processing happen outside of the mobile device [MCC Forum].



Mobile application and the Cloud

9



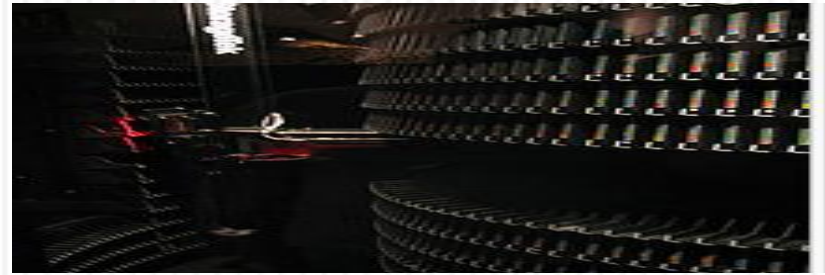
MCC Advantages

10

Extends battery life



Enhance storage capacity and bandwidth



Reliability



Battery Life

11

Challenges

Traditional approaches
require

- ✓ A radical change in the hardware structures
- ✓ Changing the battery

MCC's solution

- ✓ Offloading
- ✓ Delegation

Storage capacity

12

Challenges

- ✓ More storage capacity,
- ✓ Change the phone

MCC's Solution

Everything is in the
Cloud

Reliability

13

Challenges

- ✓ Loosing your Phone
- ✓ Accidantely deleting your data

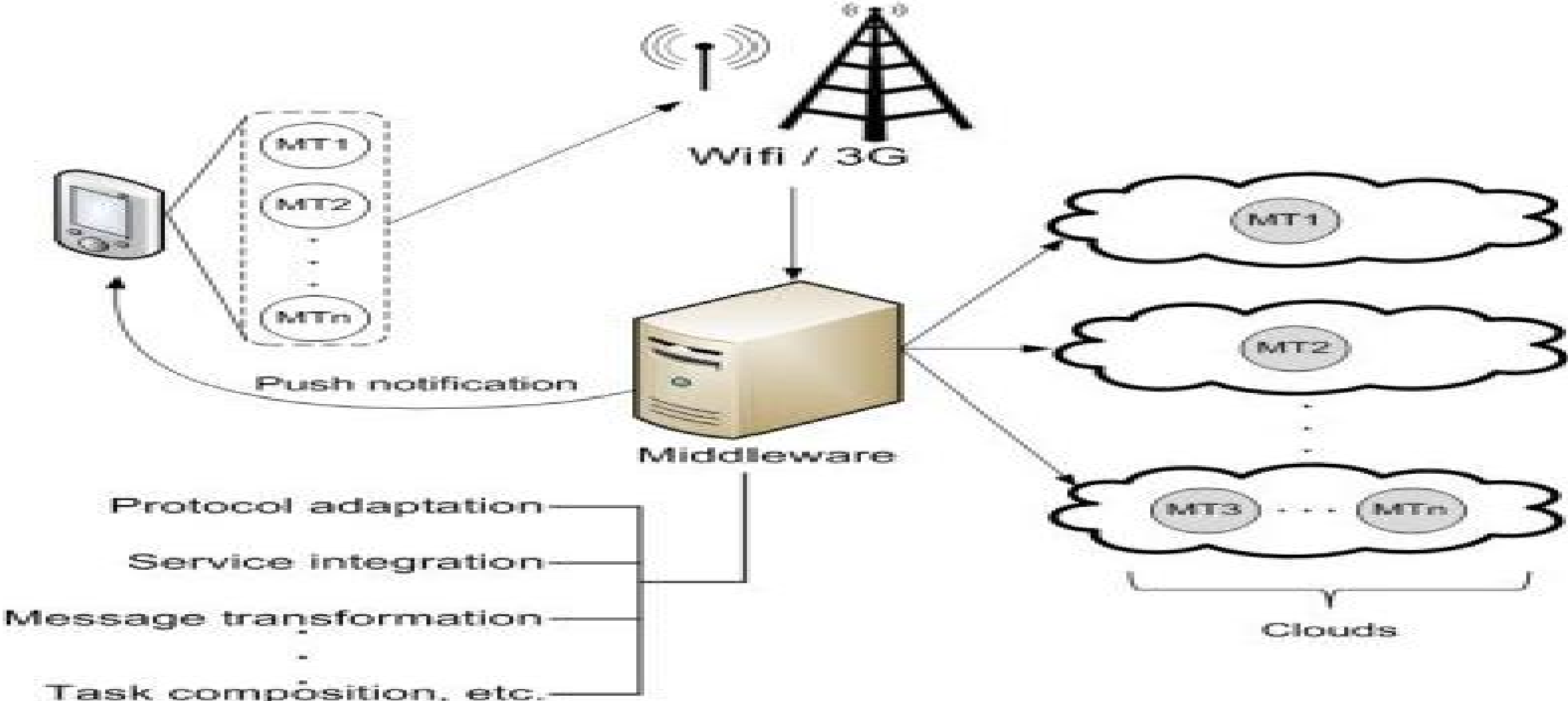
MCC's solution

Data are stored in the Cloud

Related Works

- The purpose of Mobile Cloud Computing is to improve the performance of mobile devices by leveraging the Cloud.
- Among the main concerns of researchers in this area is
 - ▣ how to extend battery life?
 - ▣ How to manage the complexity of processing and communication in the Cloud?
 - ▣ and more other concerns.

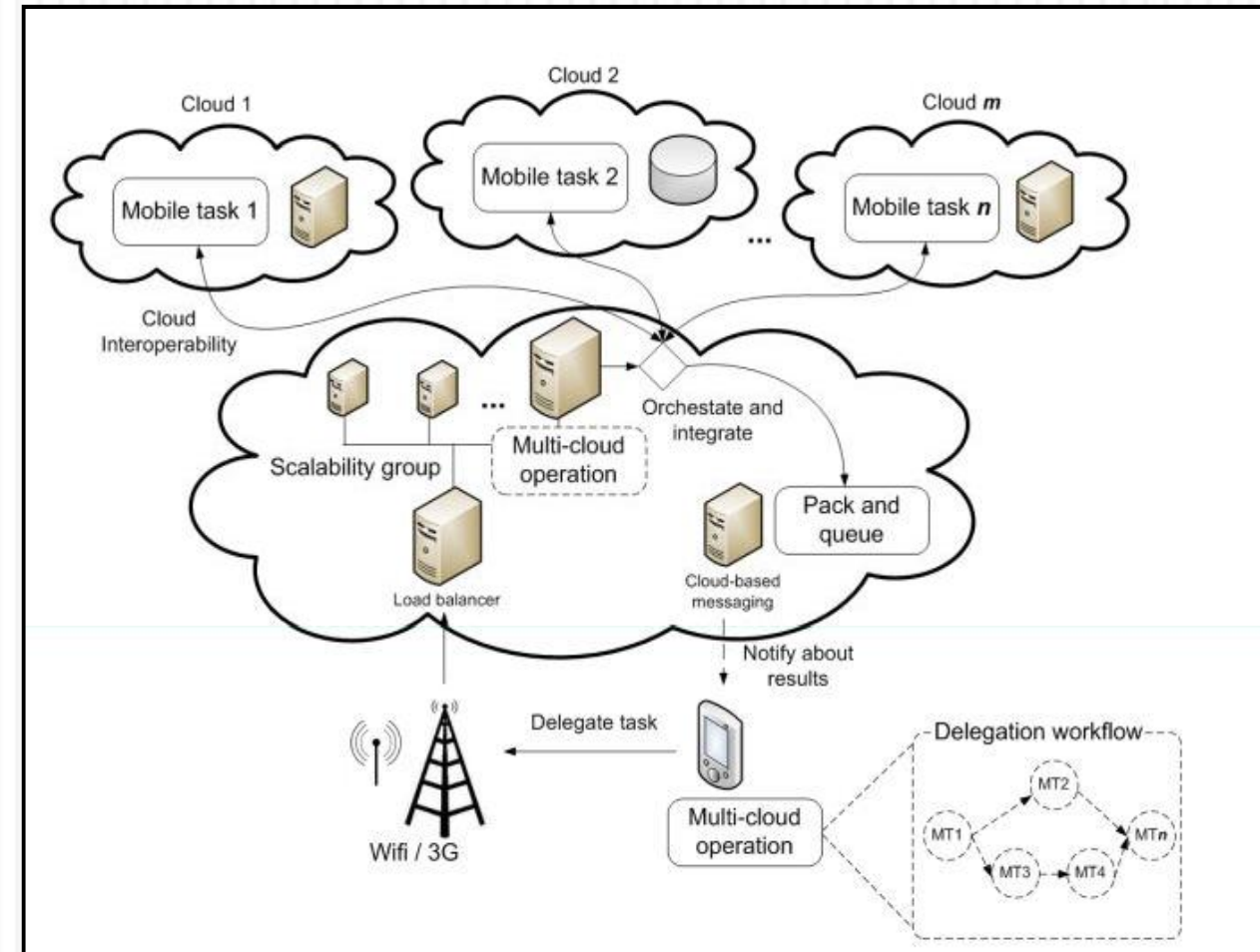
MCC Acces Model 'Delegation'



Mobile Cloud Middleware

16

- Mobile Cloud Middleware: addresses the issues of interoperability between multiple Cloud, transparent delegation and asynchronous execution of mobile tasks that require processing resources and dynamic allocation of cloud infrastructures. [Huber.F and *al.* 2014]

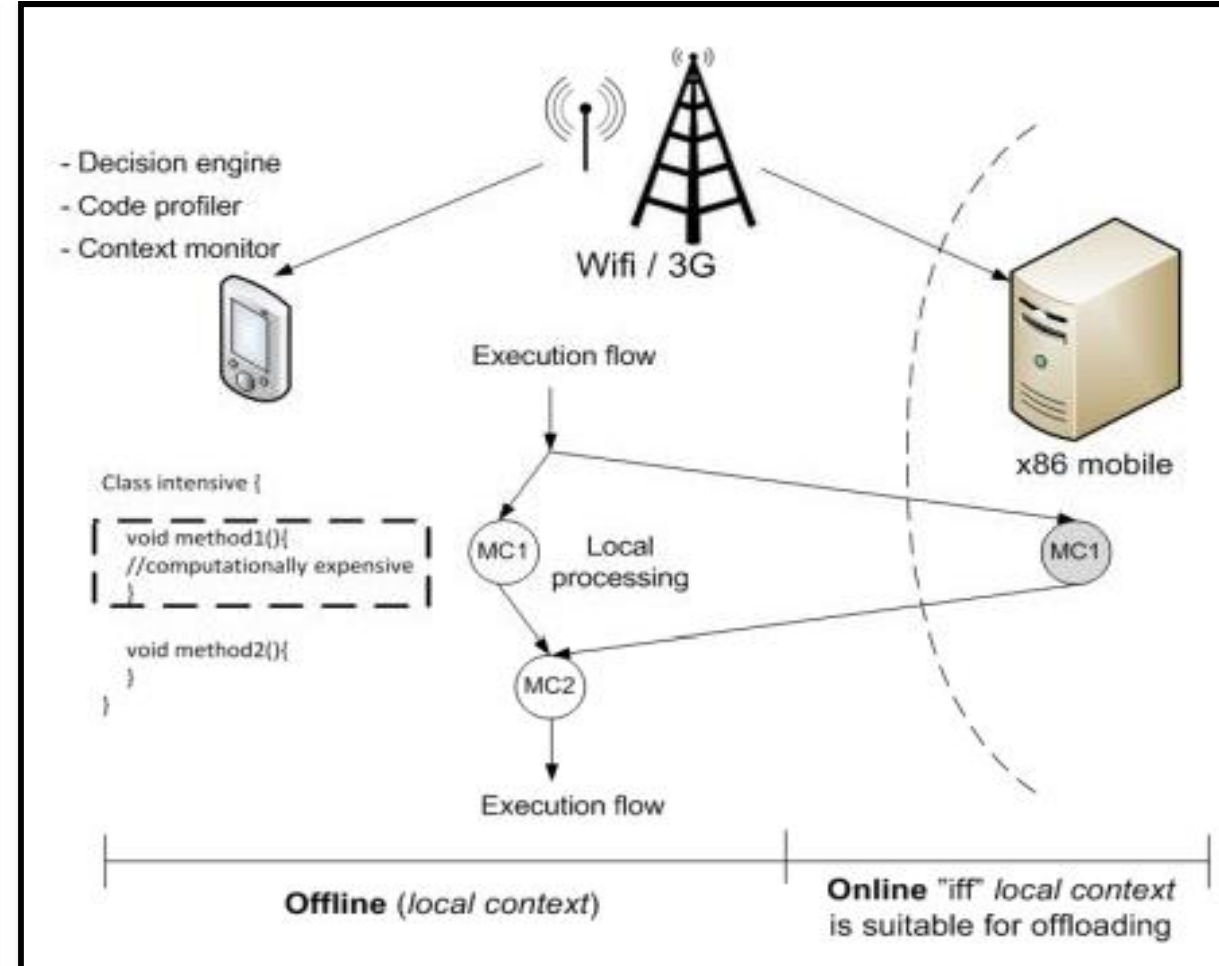


Asynchronous mobile task delegation for resource-intensive operations [Flores and al 2014]

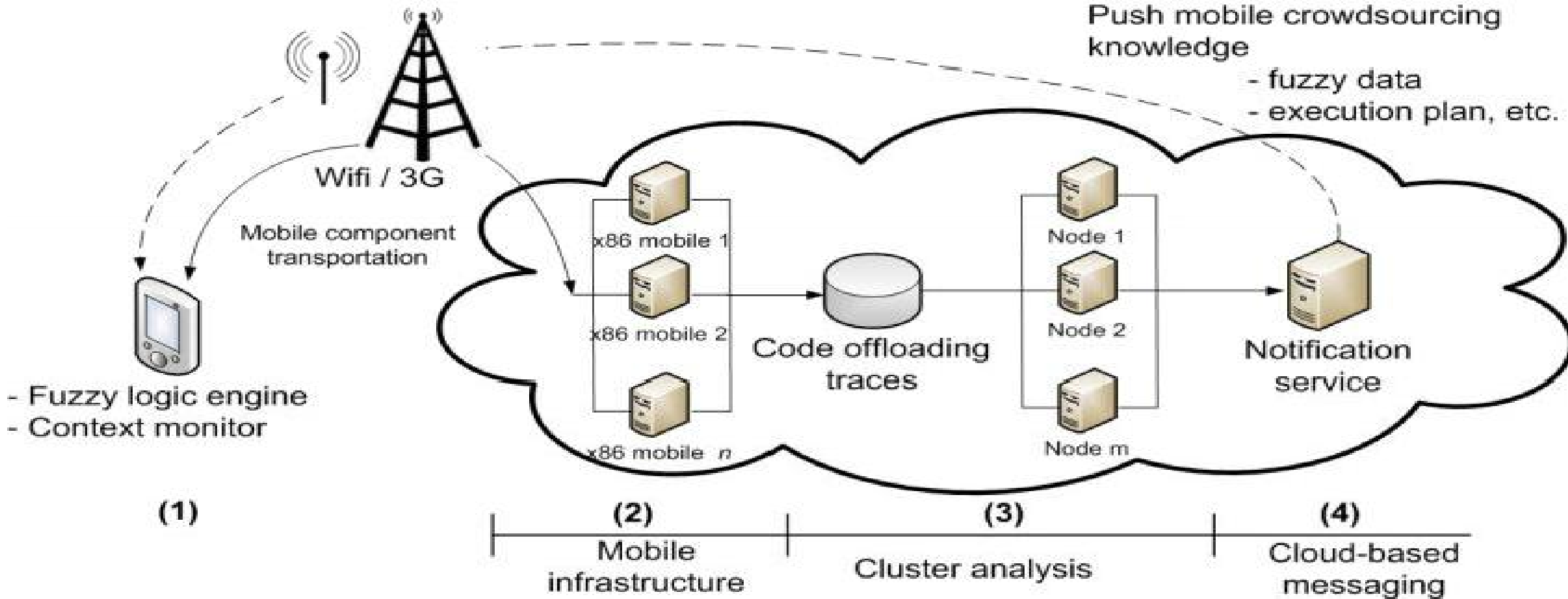
Modèle d'accès au MCC

17

- Deciding what to Offload is done according to the mobile's context parameters (bandwidth capacity, battery, data size)
- What, When, How to Ofload from the mobile to the cloud?



Evidence Mobile Cloud Offloading Architecture



Discussion

- Both Mobile and Cloud Context are managed separately
- The Cloud is not fully exploited in a systematic and methodic way.
- MCC still a recent paradigm to be fully acknowledged and handled. Thus it lack tools for modeling its basic concepts and reasoning about them.

Motivations

20

- Context awareness is often addressed at middleware level
- MC-Apps are developed in ad-hoc manner
- An abstract view of MC-Apps facilitate the reasoning on the application before its implementation
- Develop MC-Apps that are not frequently faced with bugs and panes

Motivations (suite...)

- Traditional ADLs do not have means to describe this new kind of applications.
 - ▣ MC-Apps are more complicated and have richer architectural features and more constraints than a traditional applications.
- MCC demands a radically new software architectural paradigm that addresses challenges related to Mobile Cloud Application development.

Objectives

22

- Enable the development of **MC-Apps** to be in a methodic and systematic way .
- Have awareness on both contexts of the **Mobile** and the **Cloud**.
- Foster the reusability auto-adaptability of **MC-Apps** since the latter will have an architectural representation.

Proposed Approach

23

- IN order to Handle mobile's and cloud's contexts simultaneously we will try to gather all basic concepts of both contexts to ensure a better, methodic, systematic MC-Apps development process.

Proposed Development Environment

24



Architectural level

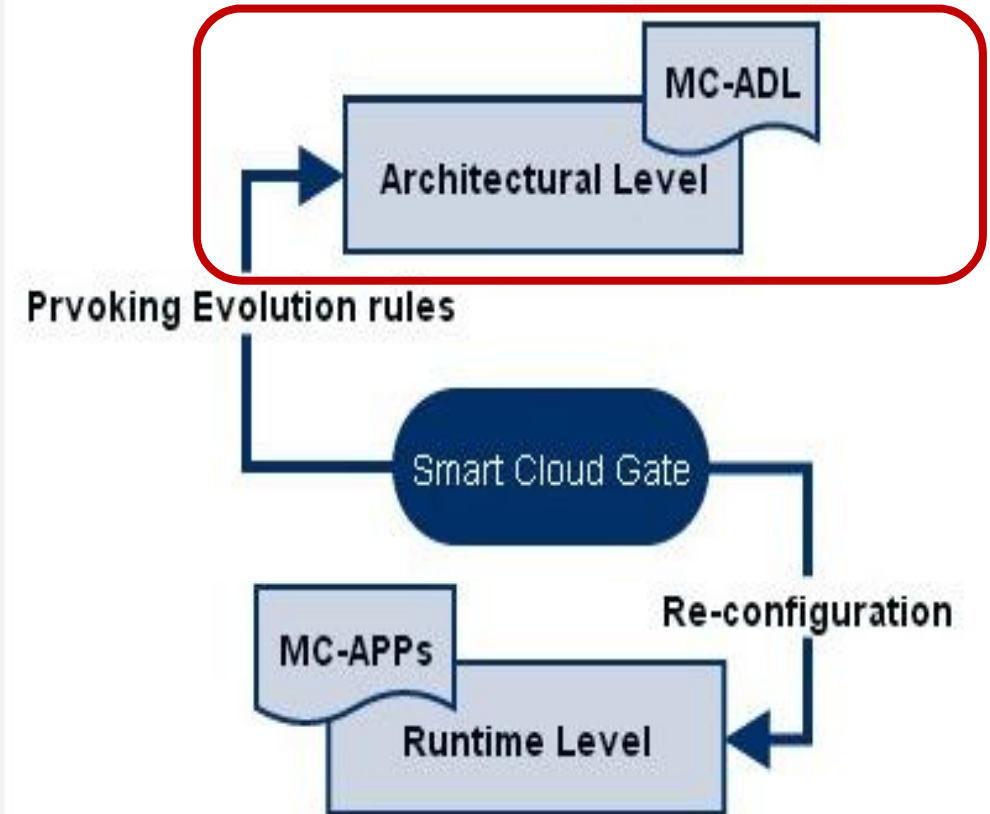
Middlewares
Level

RunTime
Level

Architectural level

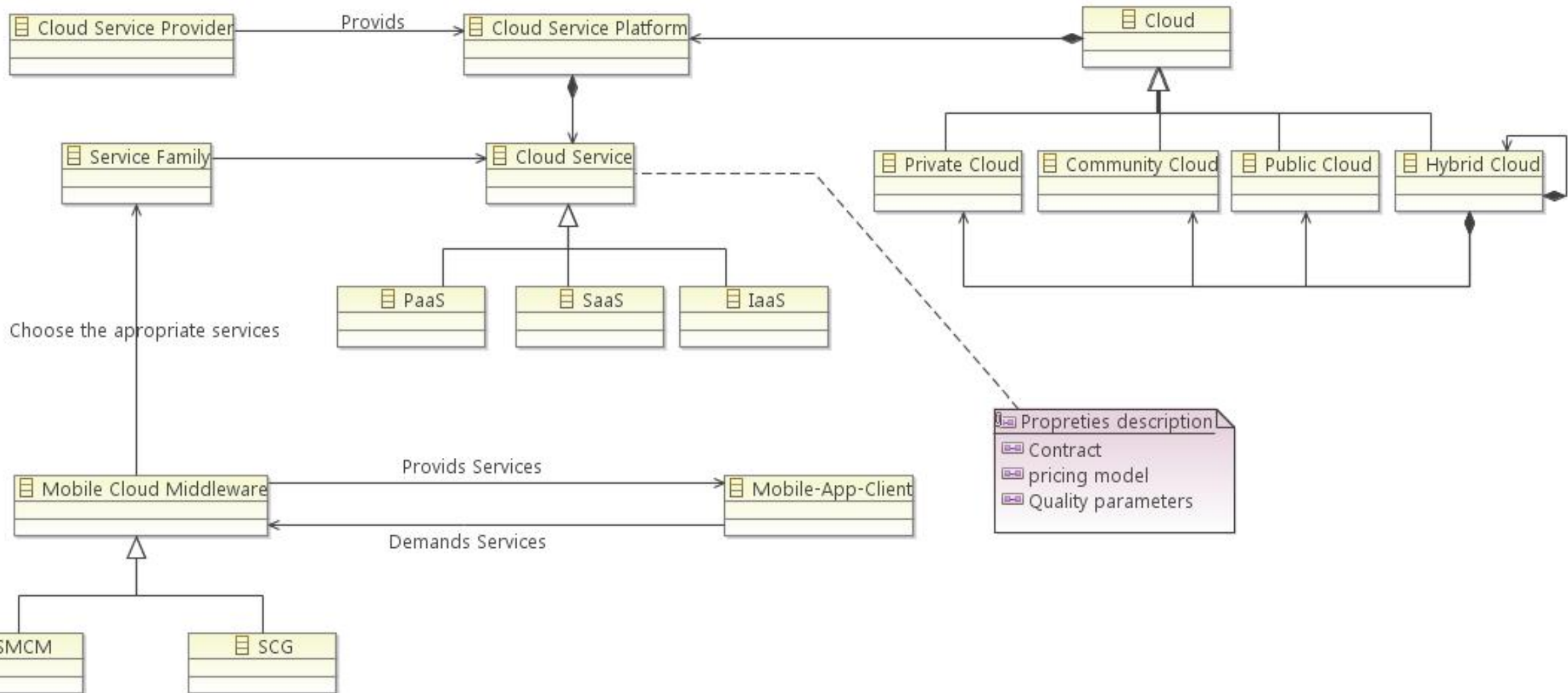
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- We propose an ADL for modeling MC-Apps Architectures to allow the developer implementing its Mc-Apps in well structured manner



A Simplified Version of Mobile Cloud ADL

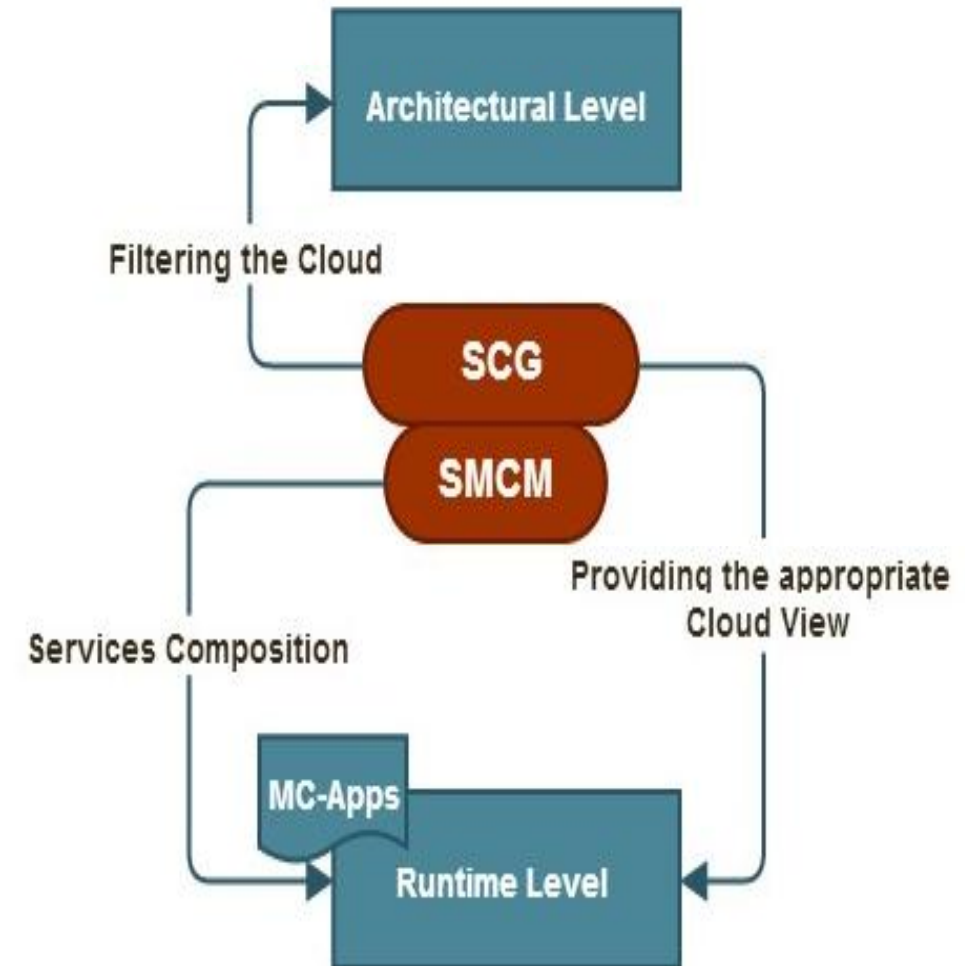
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Middleware level (1)

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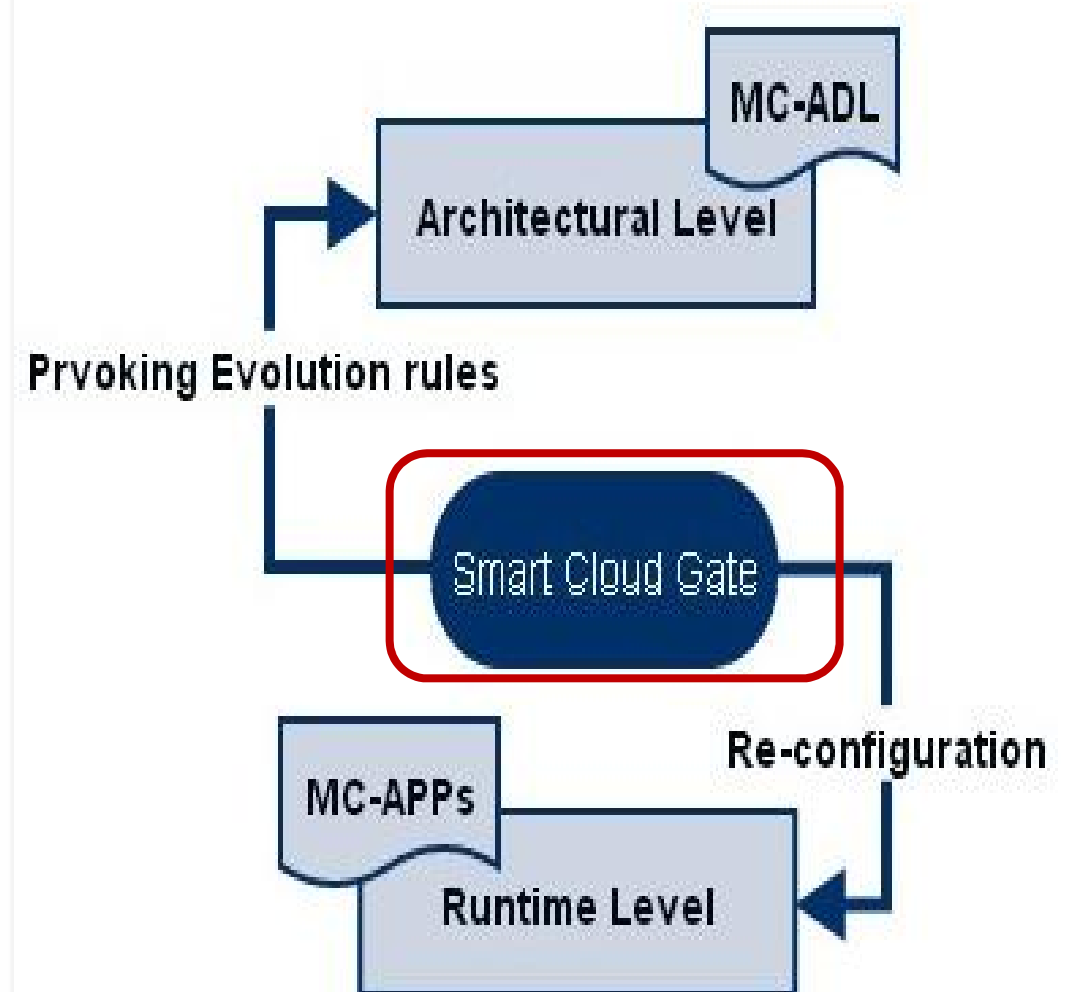
Smart Mobile Cloud Middleware:
to address communication issues
between the mobile and the cloud,
SMCM implements a cloud services
composition mechanism



Middleware level (2)

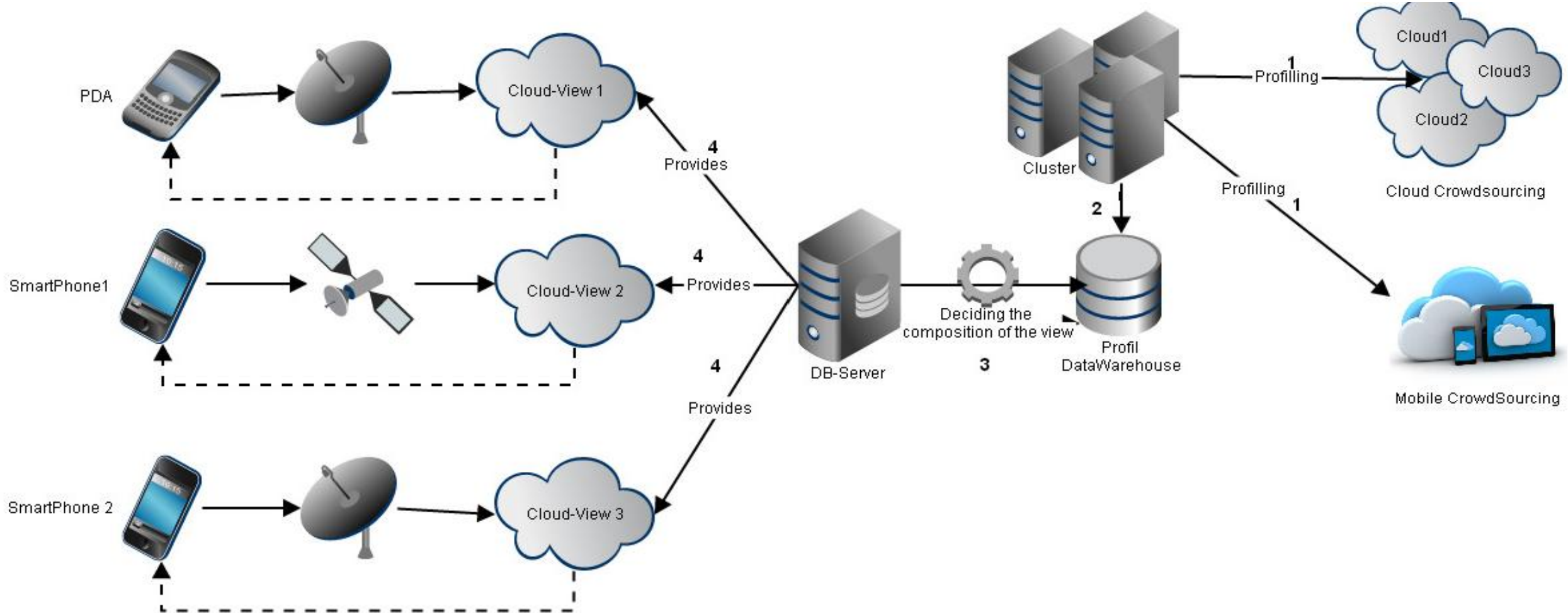
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- SCG keeps a tractability link between the re-configuration of the Mc-Apps and its architecture and vice-versa .
- SCG manages the evolution of the architecture and re-configuration of MC-Apps
- More points



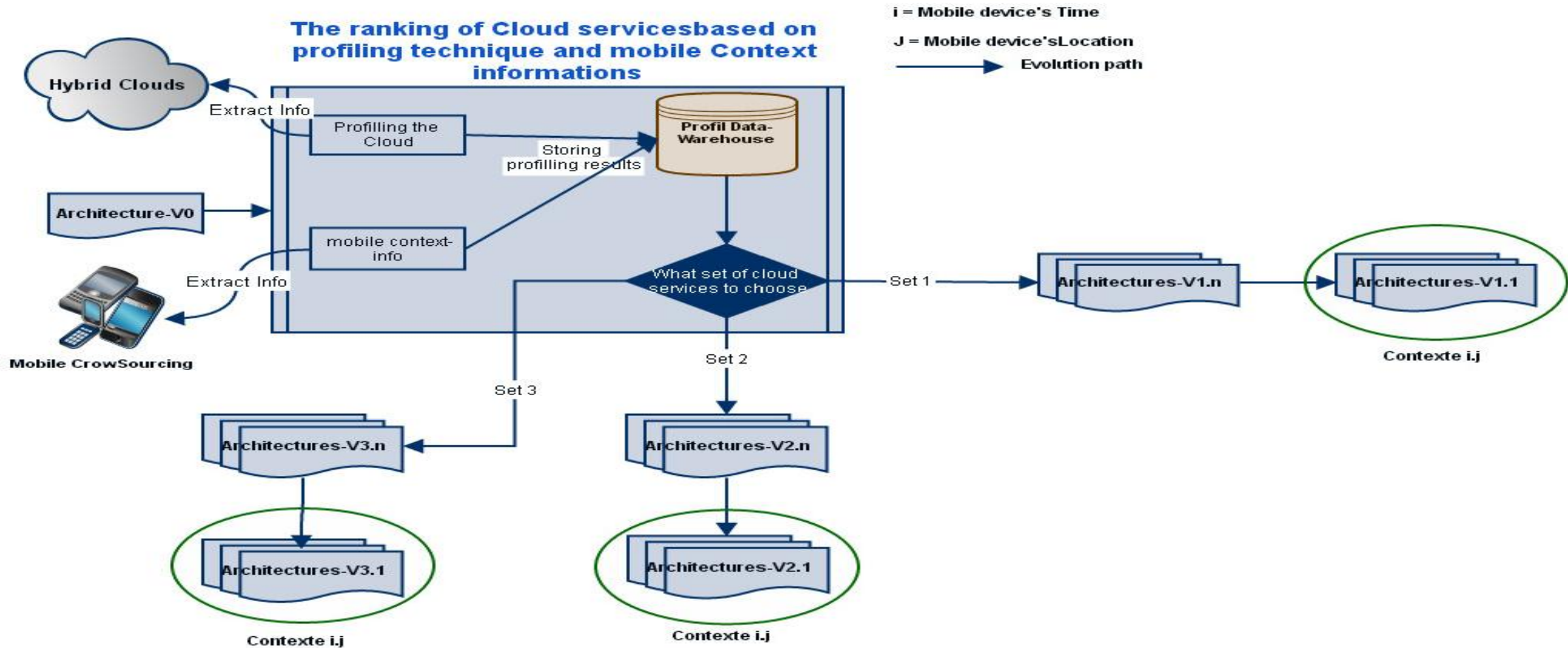
Smart Cloud Gate' architecture (Middleware Level)

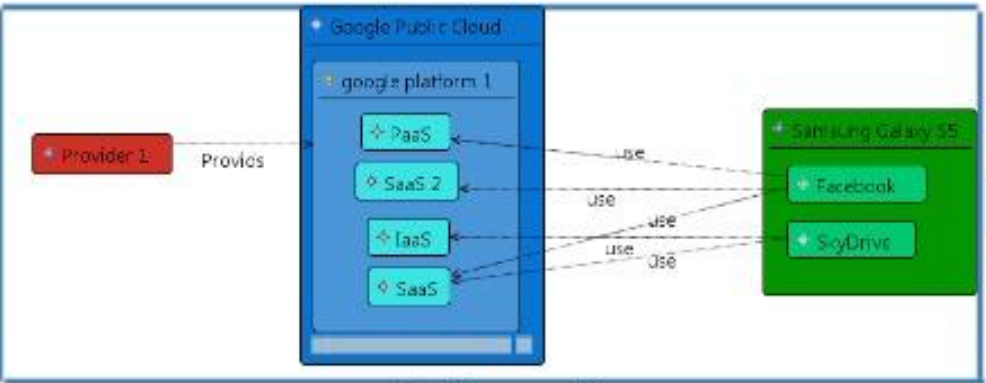
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MC-Apps's Architecture Evolution Mechanism

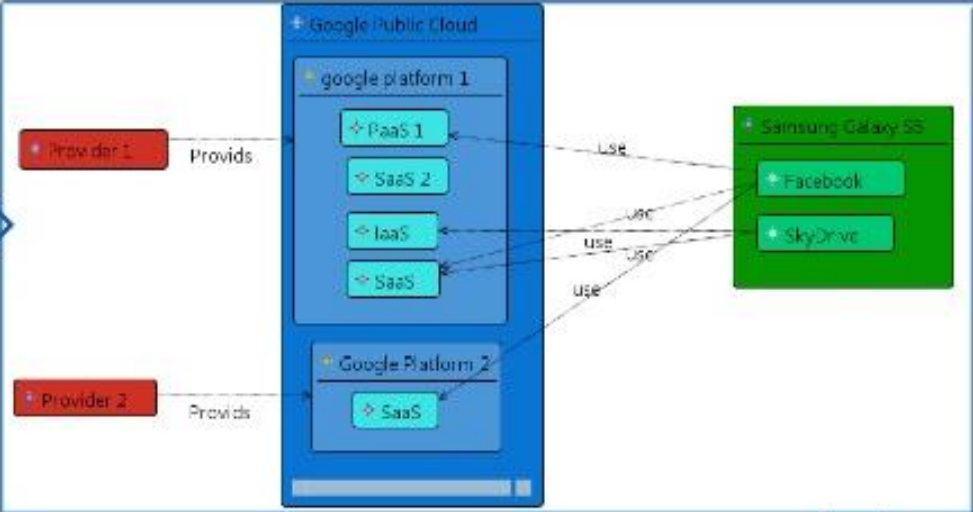
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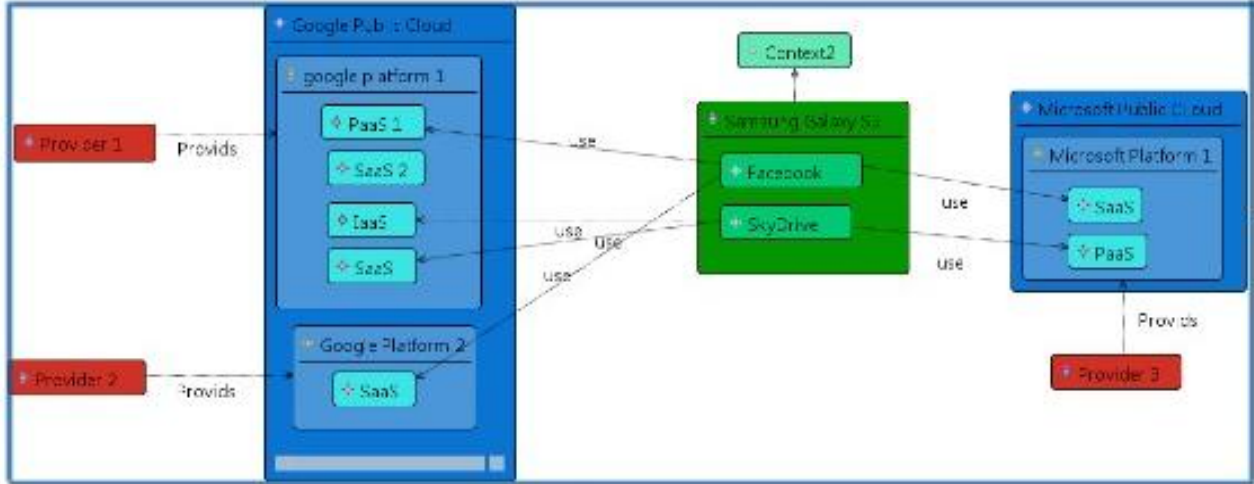
ArchitectureV0

Profiling the cloud and the mobiles



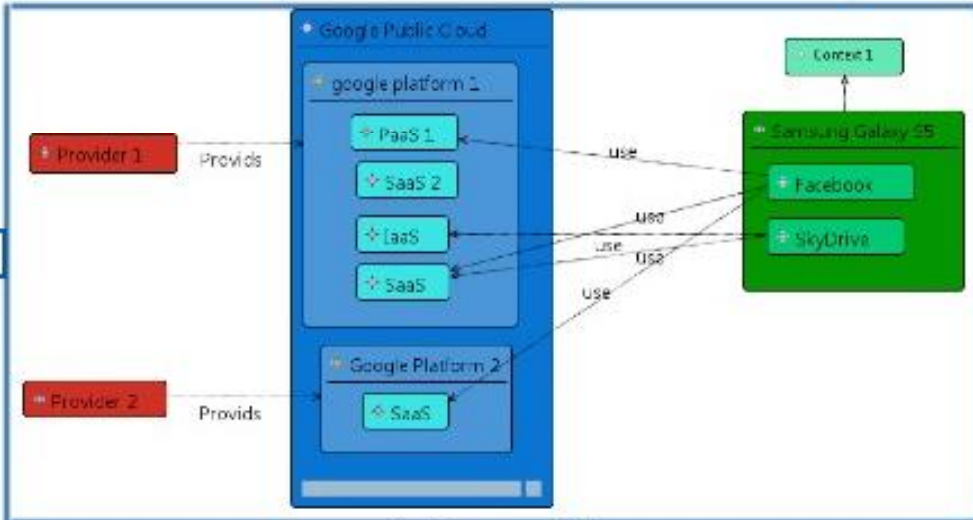
ArchitectureV1

Context 1



ArchitectureV2.1

context 2

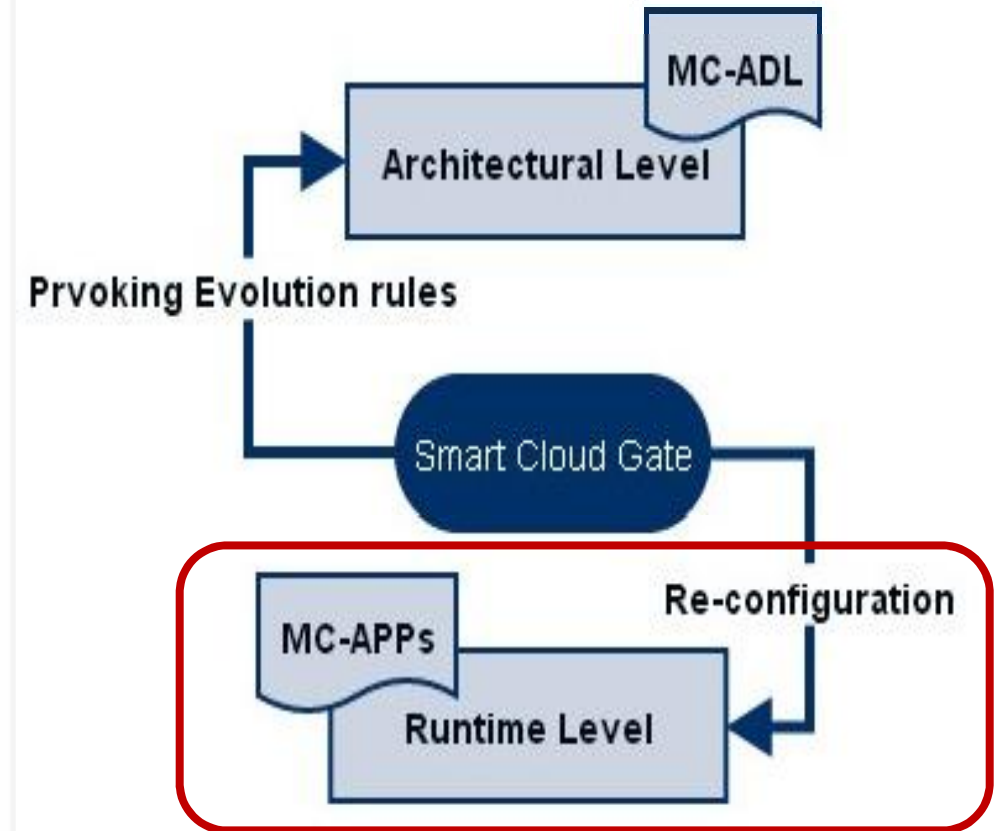


ArchitectureV2

Runtime Level

32

- SCG is continuously operating since it will keep monitoring both architecture and the application as well for the cloud



Conclusion

- We aim to make the development of MC-APPs a sophisticated, methodic process by proposing a smart environment allowing their description and managing their architecture's evolution

Thank You

34

We thank you for sending this invitation .
And also for paying us much attention.
for looking after our scientific intention.
And help us go far with our humble ambition.
Although it have been a day full of tension.
But for us it was the best situation.
It will be in every story of our mentioned.
Because simply you got us at the perfect direction.