

# myTaxiService

## Final Presentation

Jacopo Strada, Luca Riva

Politecnico di Milano  
Software Engineering 2 Project

February 26, 2016

## 1 Requirement And Specification

- Scope
- User Interfaces
- The World and The Machine
- Use Cases
- Alloy

## 2 Design

- Component View
- Architectural Style

## 3 Integration Testing

- Overall View on Integration Components
- Integration Steps

## 4 Project Planning

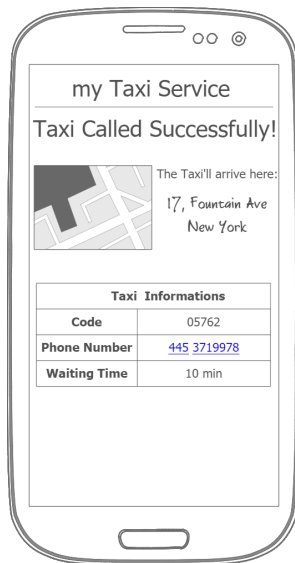
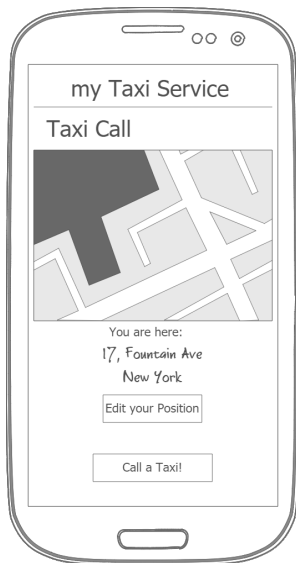
- Function Points
- COCOMO
- Gantt Chart

The *myTaxiService* software focuses on helping the clients benefit from the service and ensures a fair management of taxi queues.

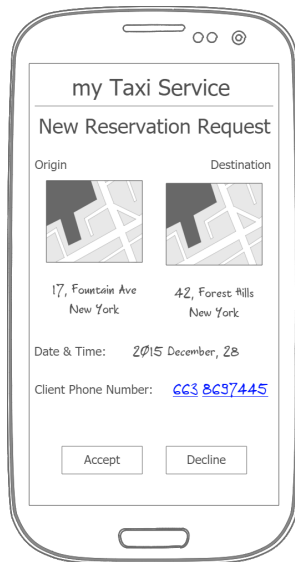
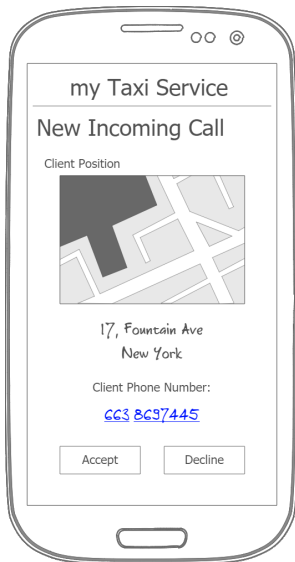
The software will:

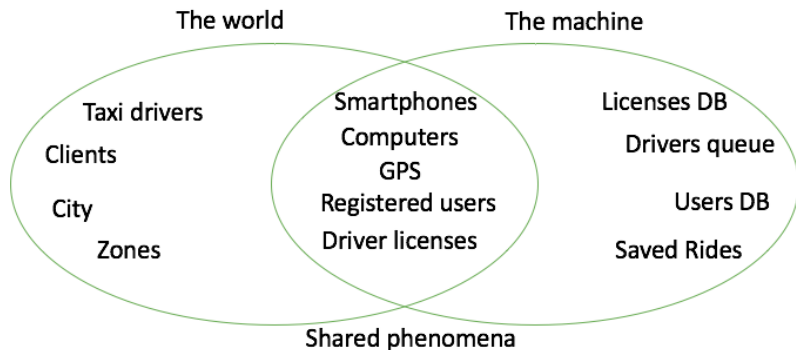
- give the possibility to request a taxi either through a web application or a mobile app.
- compute the distribution of taxis in the various zones based on the GPS information it receives from each taxi.
- offer programmatic interfaces to enable the development of additional services.
- allow to book a taxi by specifying the origin and the destination of the ride.





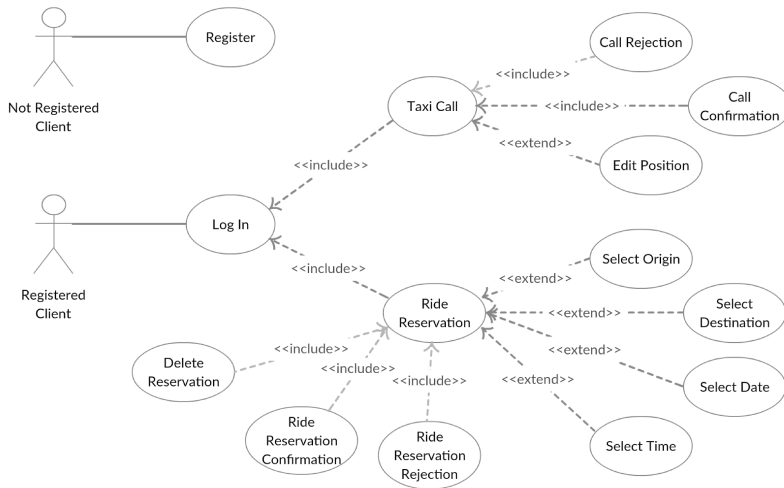
# Taxi Drivers' User Interfaces





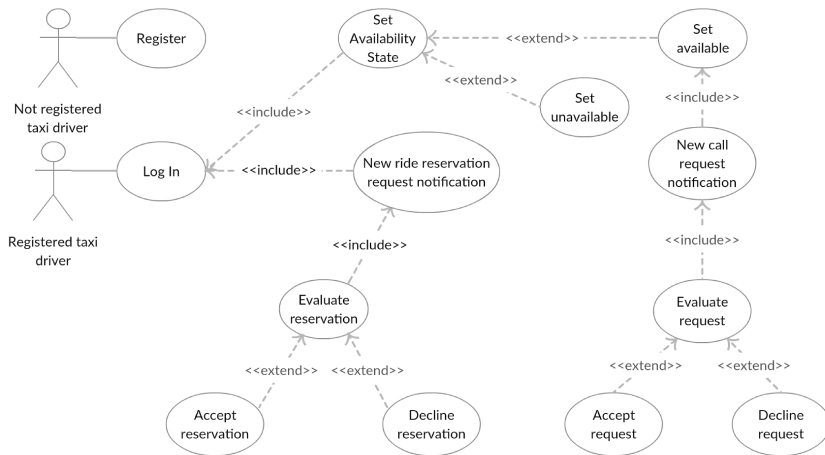
# Use Cases

## Client

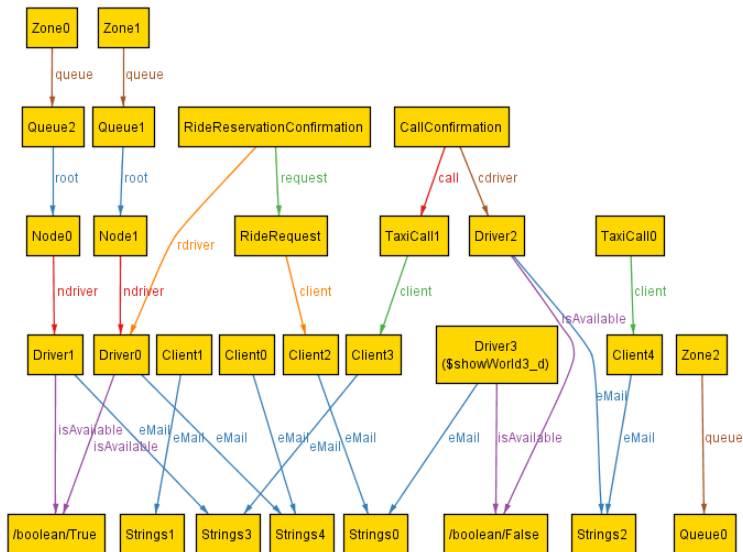


# Use Cases

## Taxi Driver







## 1 Requirement And Specification

- Scope
- User Interfaces
- The World and The Machine
- Use Cases
- Alloy

## 2 Design

- Component View
- Architectural Style

## 3 Integration Testing

- Overall View on Integration Components
- Integration Steps

## 4 Project Planning

- Function Points
- COCOMO
- Gantt Chart

# Component View

**Data Base:** Store all the information about users, zones, queues, drivers position and state, reservations ...

**Account Manager:** Logins and registrations (check all the constraint). Change drivers state.

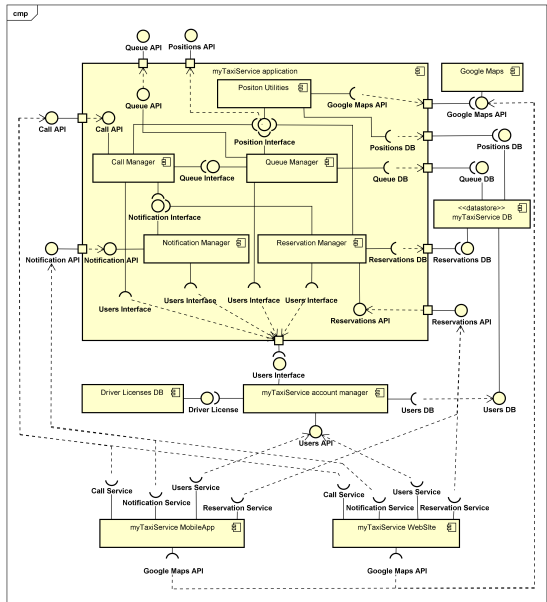
**Call Manager:** Get the correct zone from the client position, find an available driver and send a confirmation to the client.

**Queue Manager:** Provide the first driver in a queue given a zone and manages drivers adding, removing add moving to the end.

**Reservation Manager:** Checks if a reservation is valid and when a driver accepts it, the reservation is stored in the database.

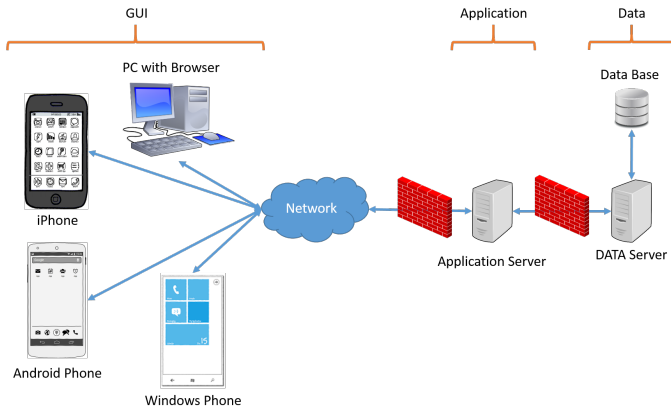
**Notification Manager:** Employed for sending notifications to drivers and clients.

**Position Utilities:** Return a zone from an address, calculate an estimated time for a call or validate a path for a reservation.



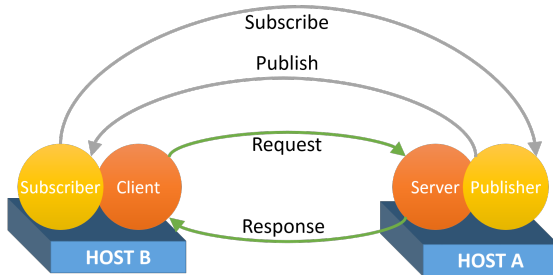
# Architectural Style I

The system was designed with a *three-tier* architecture: Data, Application Logic and GUI are separated and there are two levels of firewalls in order to keep a high level of security.



The **client server** is used for all the communications which are composed by a request, made by the client, and a response, given by the server.

The **publisher-subscriber** is needed for the notification service.



## 1 Requirement And Specification

- Scope
- User Interfaces
- The World and The Machine
- Use Cases
- Alloy

## 2 Design

- Component View
- Architectural Style

## 3 Integration Testing

- Overall View on Integration Components
- Integration Steps

## 4 Project Planning

- Function Points
- COCOMO
- Gantt Chart

# Overall View on Integration Components

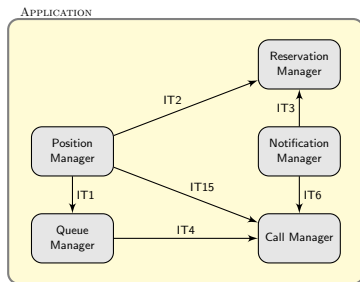
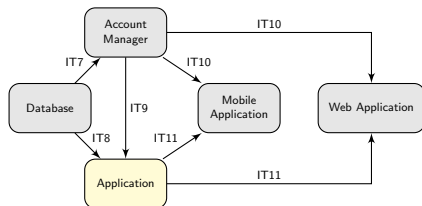
## Strategy:

Bottom Up approach but... not pure!

Test the integration starting from the application logic and finishing with the graphical user interface

Not always possible due to the presence of complex interconnections

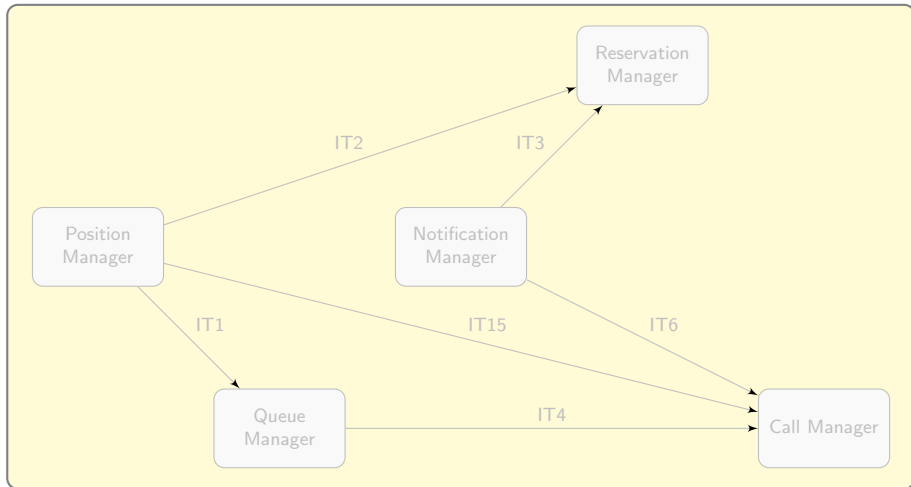
Some stubs are needed



# Integration Steps

## Application

### APPLICATION

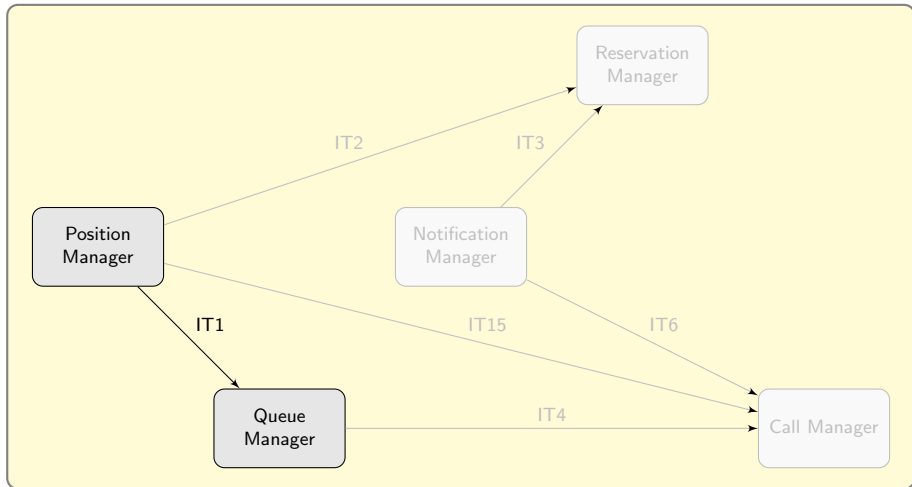




# Integration Steps - IT1

Application: Integration between Position Manager and Queue Manager

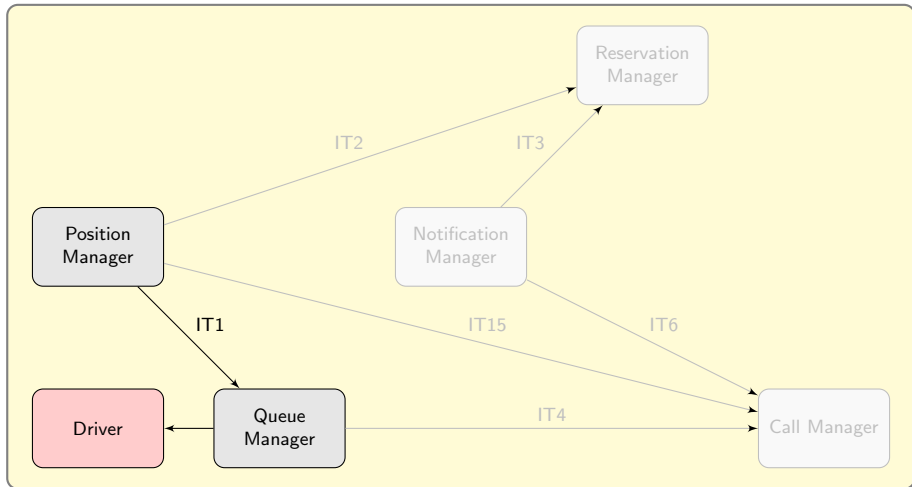
## APPLICATION



# Integration Steps - IT1

Application: Integration between Position Manager and Queue Manager

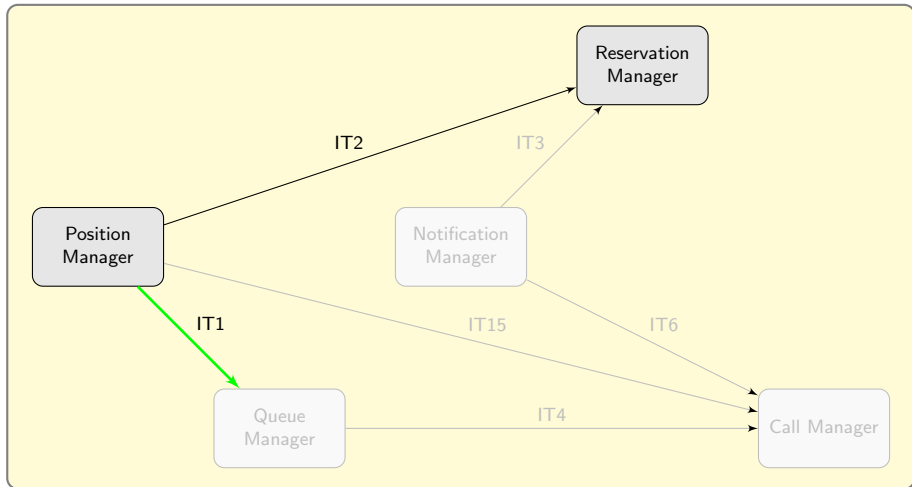
## APPLICATION



# Integration Steps - IT2

Application: Integration between Position Manager and Reservation Manager

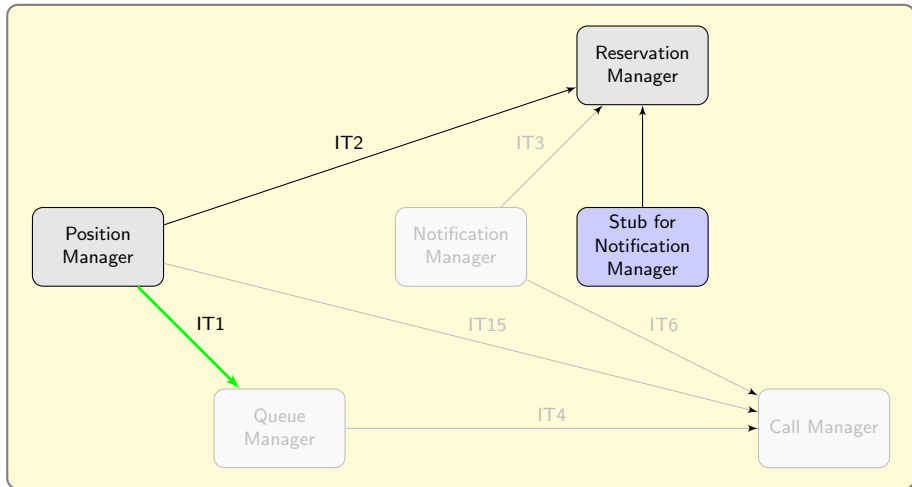
## APPLICATION



# Integration Steps - IT2

Application: Integration between Position Manager and Reservation Manager

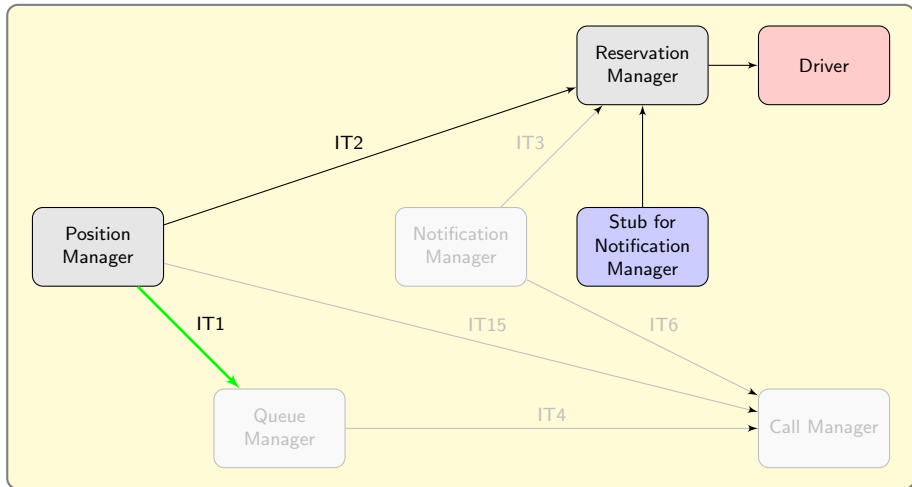
## APPLICATION



# Integration Steps - IT2

Application: Integration between Position Manager and Reservation Manager

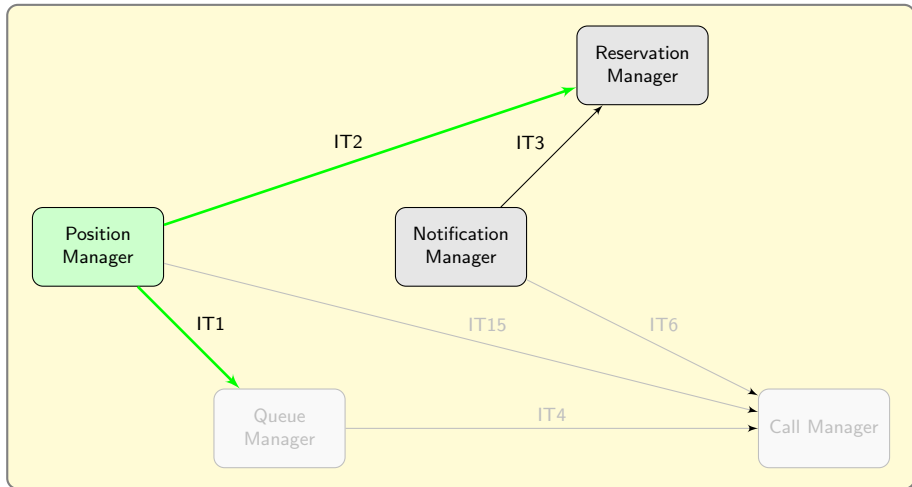
## APPLICATION



# Integration Steps - IT3

Application: Integration between Notification Manager and Reservation Manager

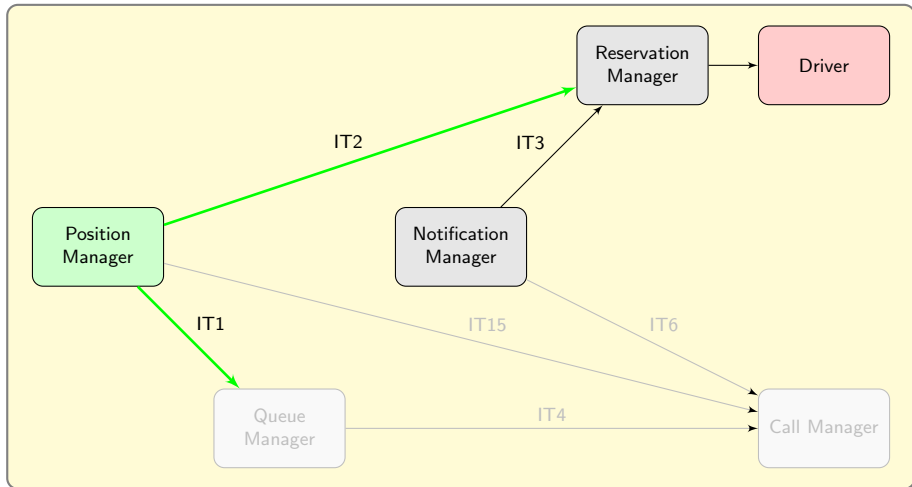
## APPLICATION



# Integration Steps - IT3

Application: Integration between Notification Manager and Reservation Manager

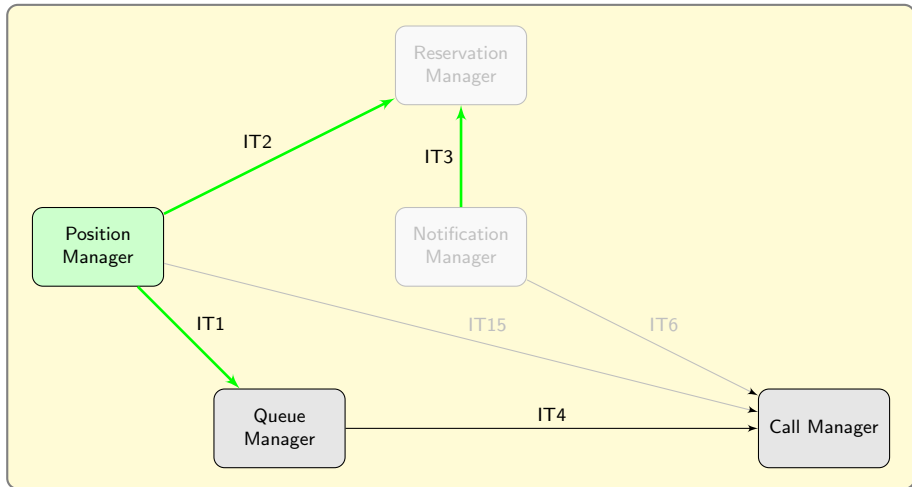
## APPLICATION



# Integration Steps - IT4

Application: Integration between Queue Manager and Call Manager

## APPLICATION

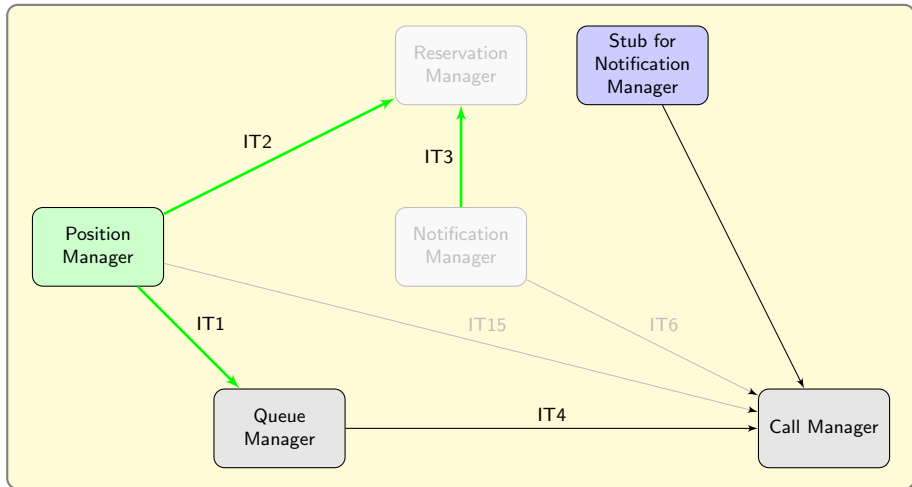




# Integration Steps - IT4

Application: Integration between Queue Manager and Call Manager

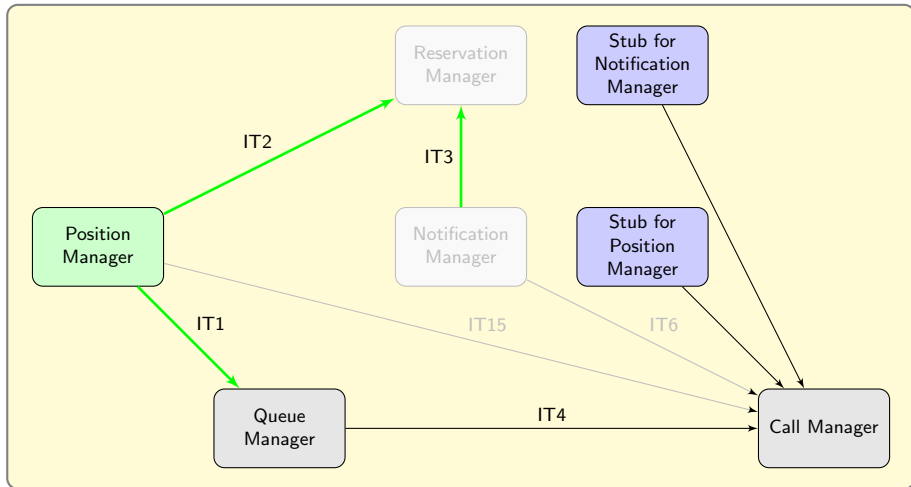
## APPLICATION



# Integration Steps - IT4

Application: Integration between Queue Manager and Call Manager

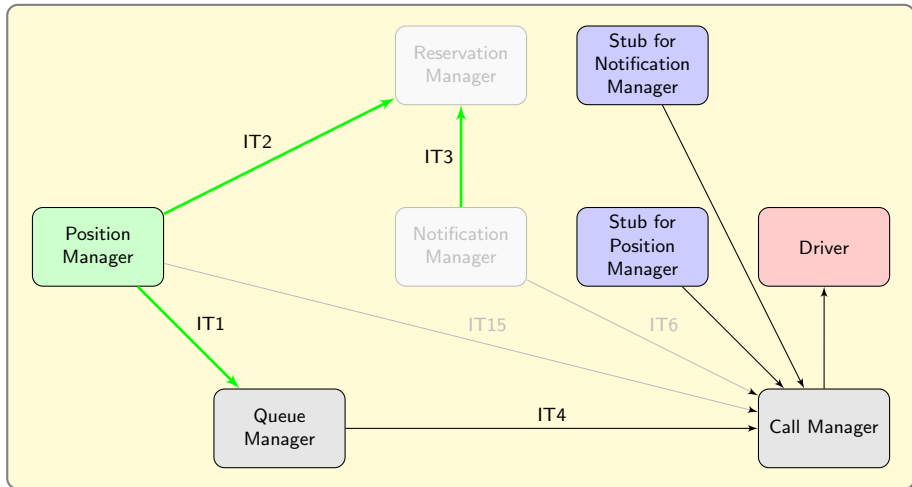
## APPLICATION



# Integration Steps - IT4

Application: Integration between Queue Manager and Call Manager

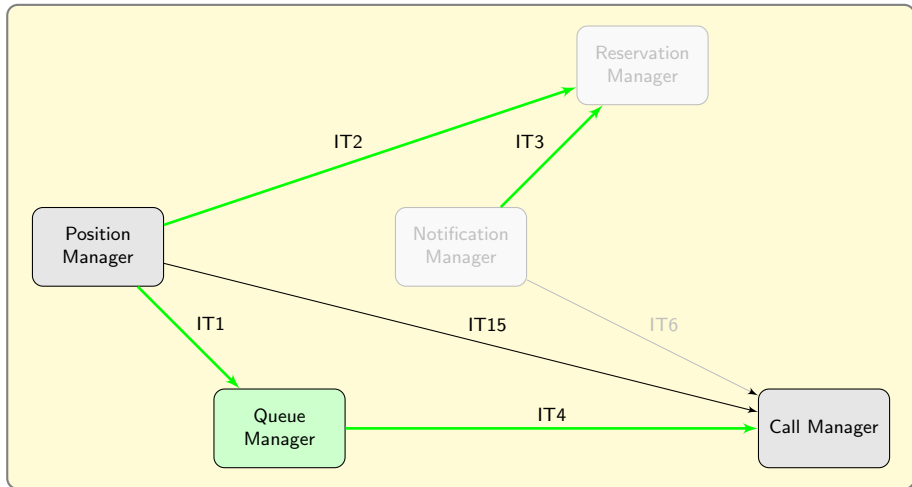
## APPLICATION



# Integration Steps - IT5

Application: Integration between Position Manager and Call Manager

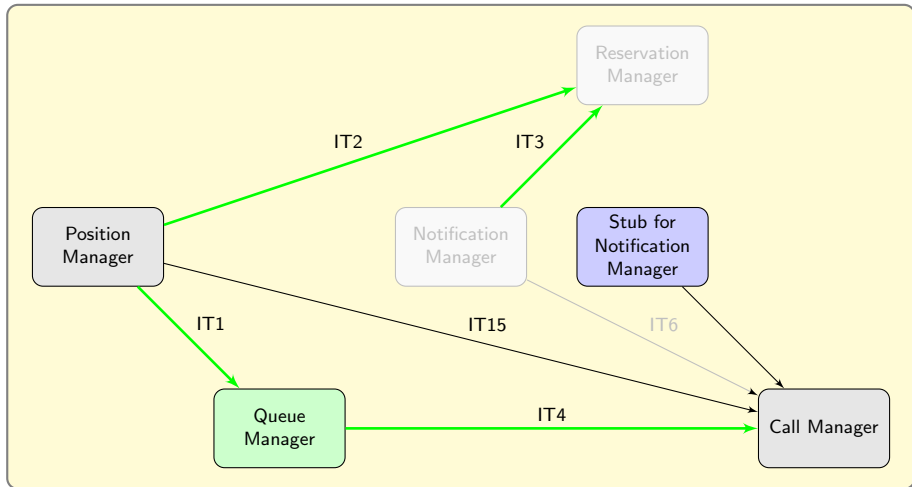
## APPLICATION



# Integration Steps - IT5

Application: Integration between Position Manager and Call Manager

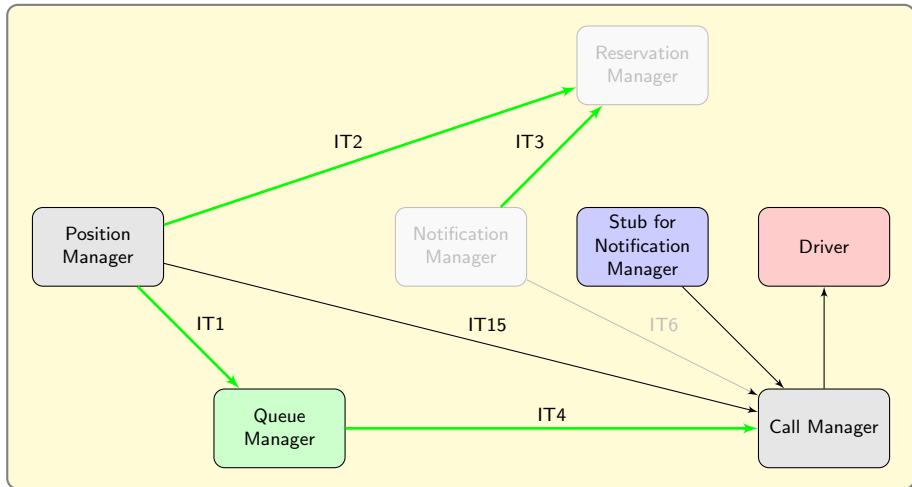
## APPLICATION



# Integration Steps - IT5

Application: Integration between Position Manager and Call Manager

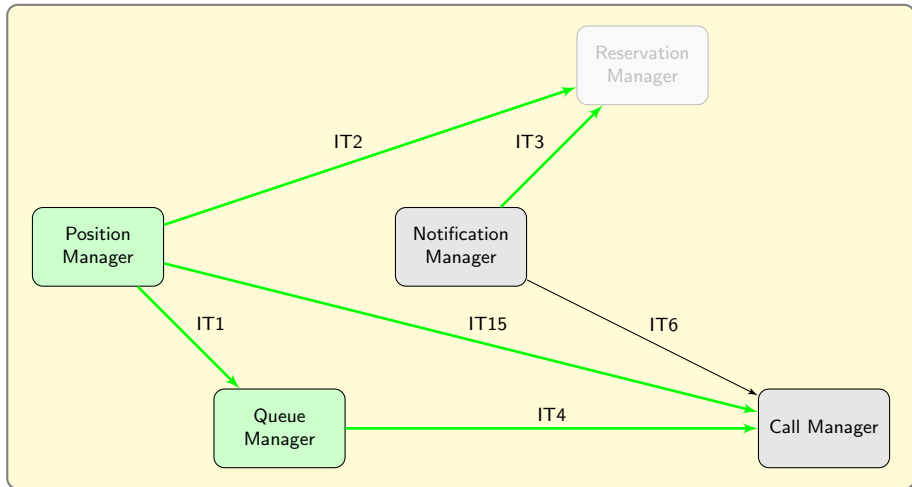
## APPLICATION



# Integration Steps - IT6

Application: Integration between Notification Manager and Call Manager

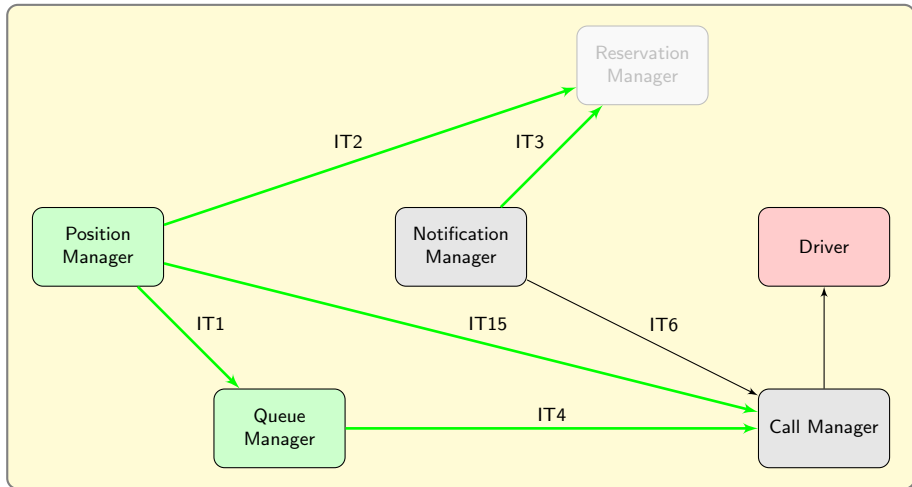
## APPLICATION



# Integration Steps - IT6

Application: Integration between Notification Manager and Call Manager

## APPLICATION

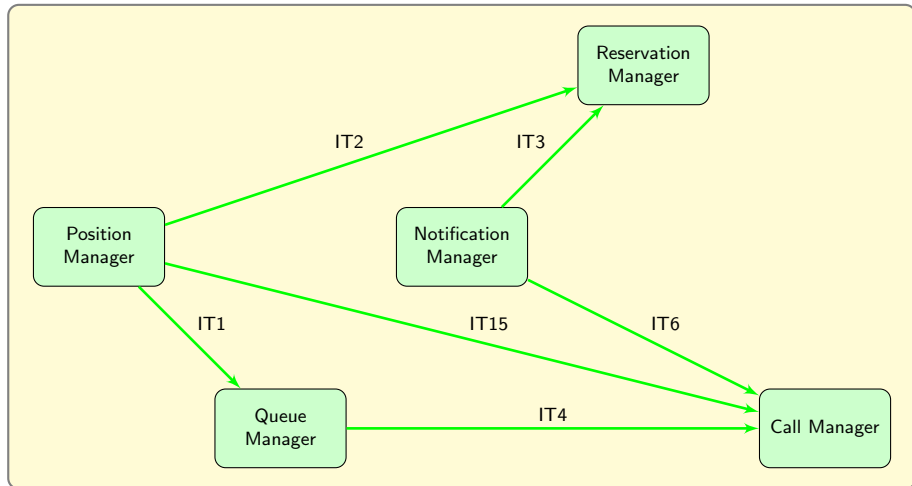




# Integration Steps

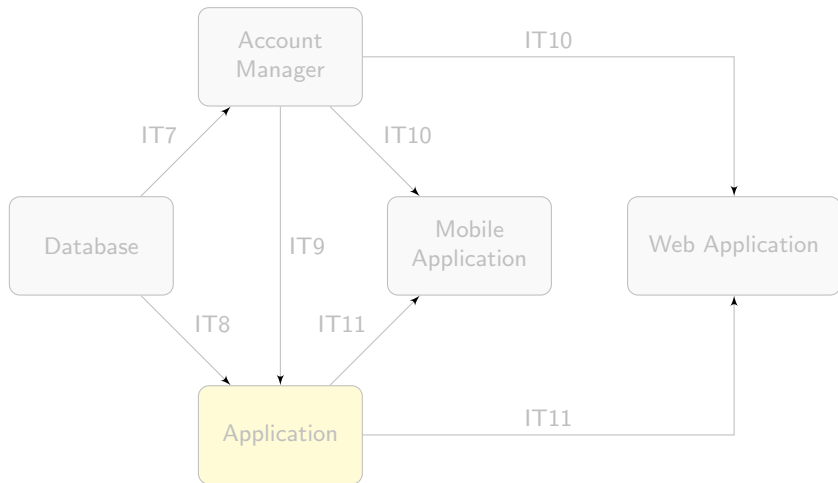
Application Tested!

APPLICATION



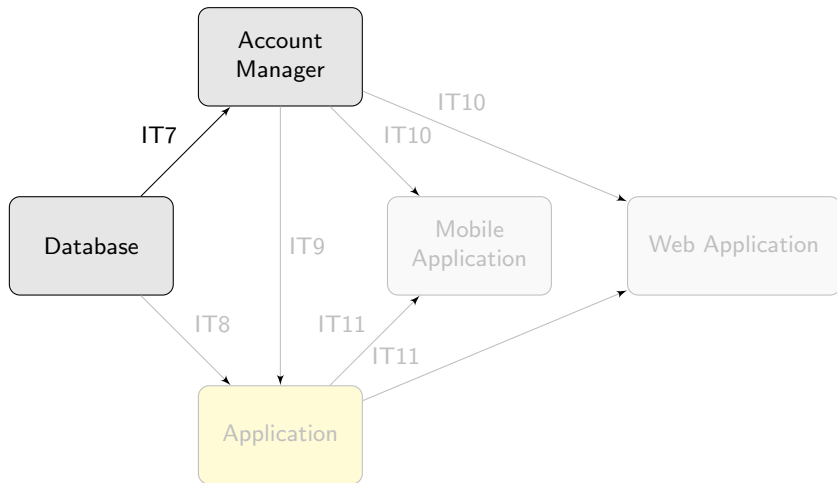
# Integration Steps

Global



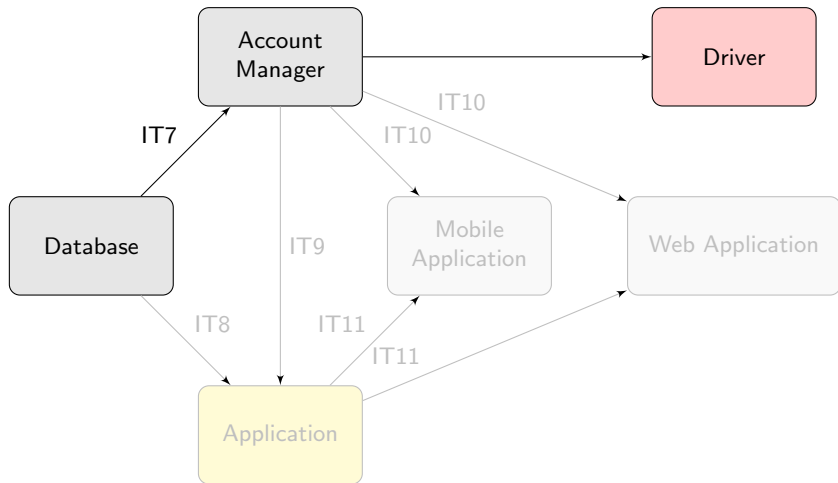
# Integration Steps - IT7

Global: Integration between Database and Account Manager



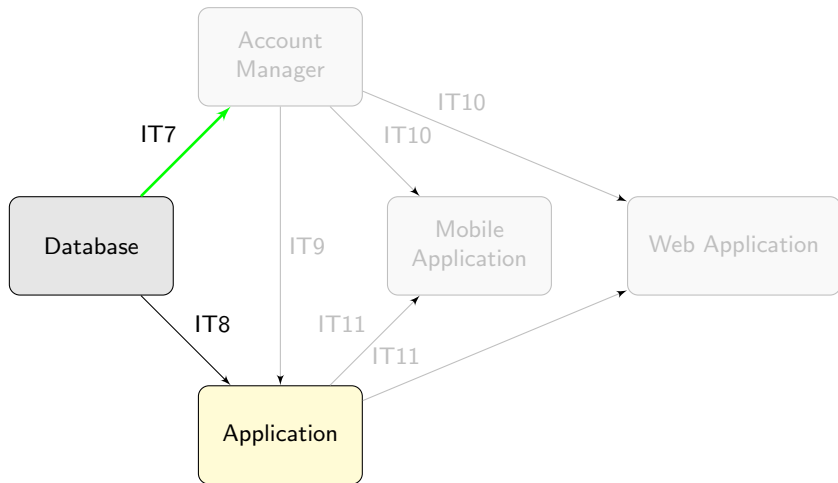
# Integration Steps - IT7

Global: Integration between Database and Account Manager



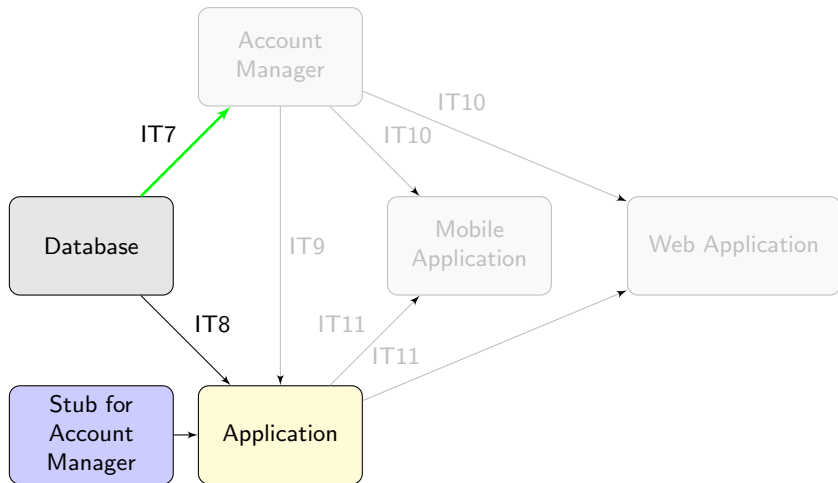
# Integration Steps - IT8

Global: Integration between Database and Application



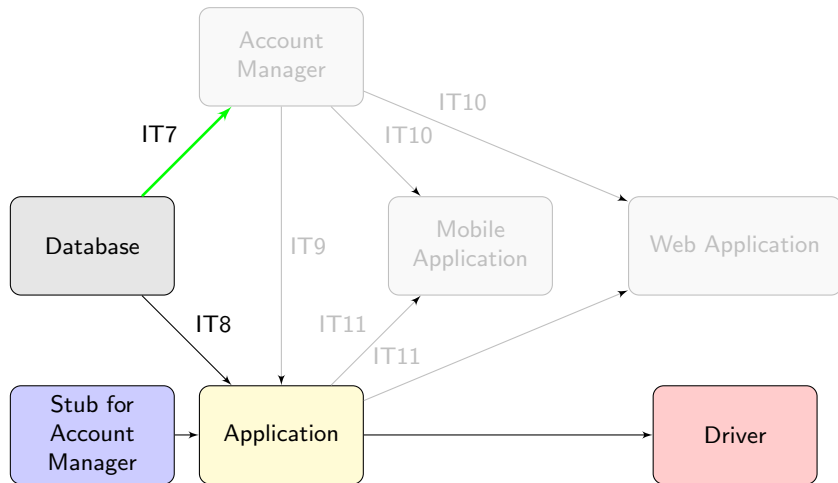
# Integration Steps - IT8

Global: Integration between Database and Application



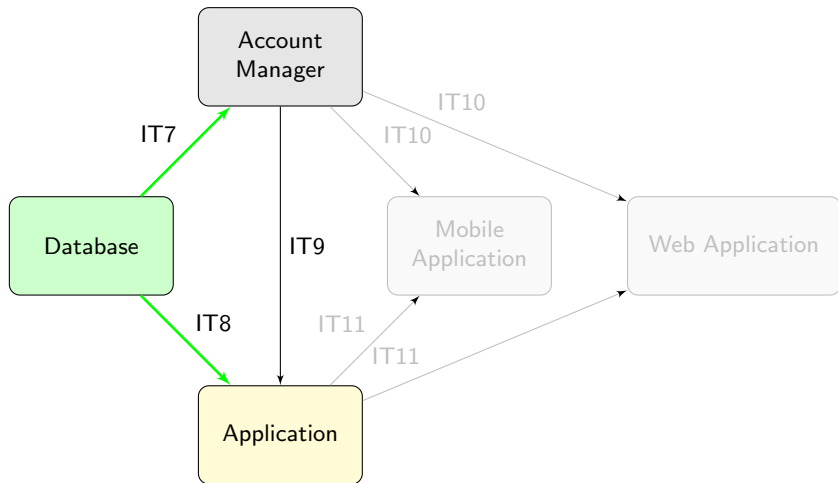
# Integration Steps - IT8

Global: Integration between Database and Application



# Integration Steps - IT9

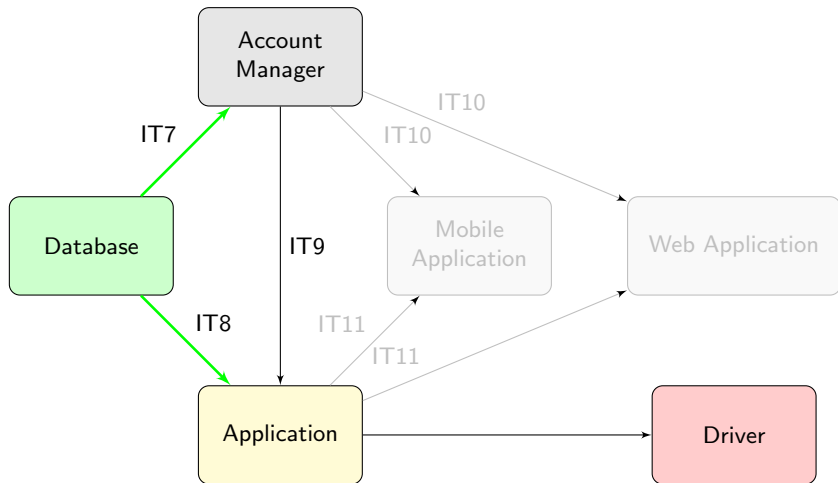
Global: Integration between Account Manager and Application





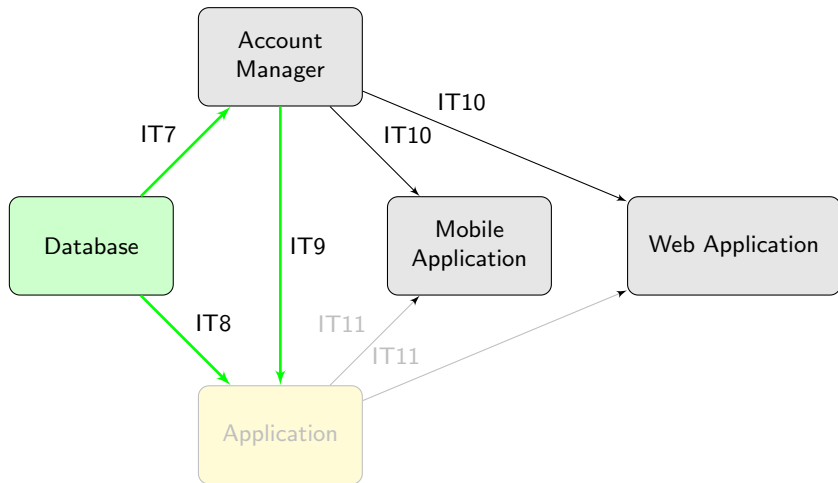
# Integration Steps - IT9

Global: Integration between Account Manager and Application



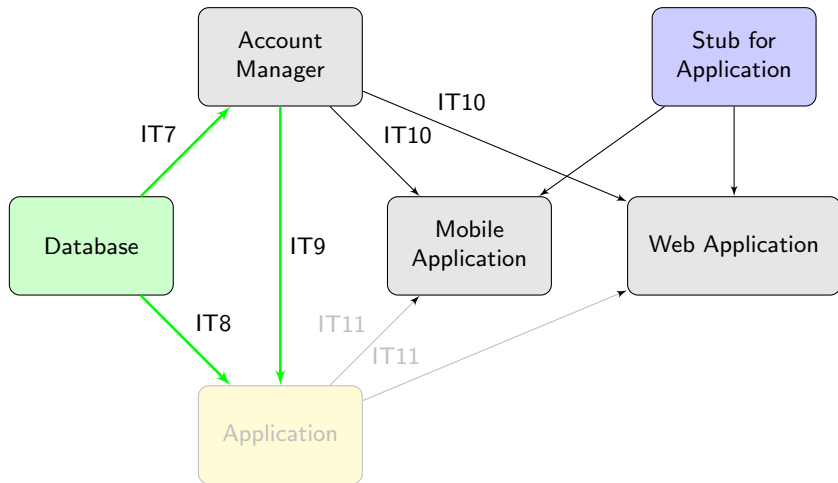
# Integration Steps - IT10

Global: Integration between Account Manager and User Interface



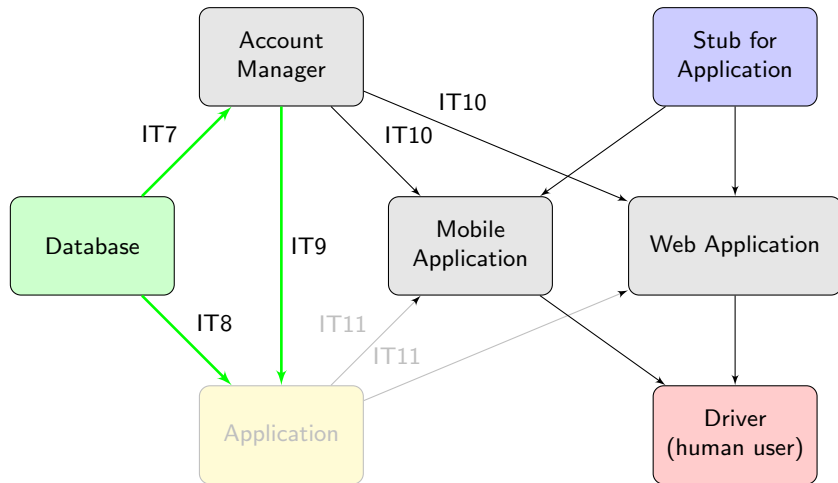
# Integration Steps - IT10

Global: Integration between Account Manager and User Interface



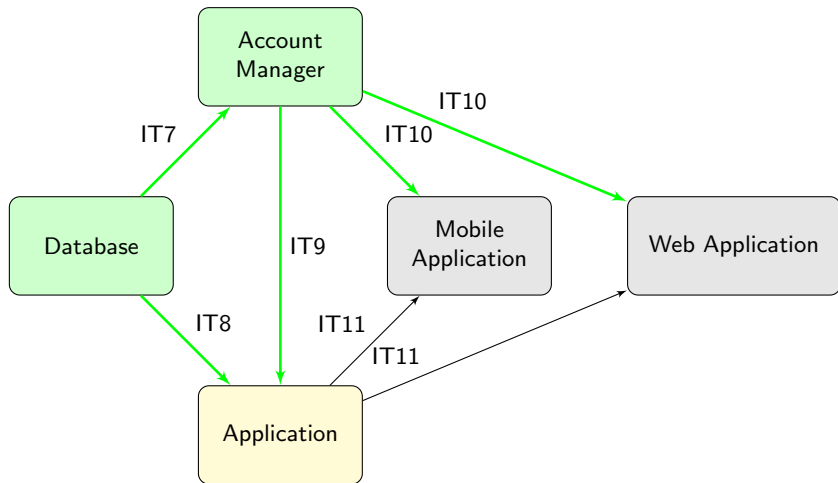
# Integration Steps - IT10

Global: Integration between Account Manager and User Interface



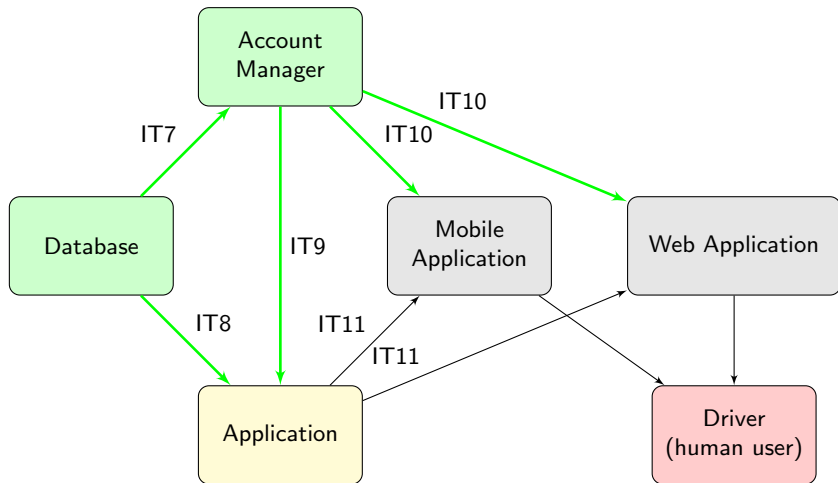
# Integration Steps - IT11

Global: Integration between Application and User Interface



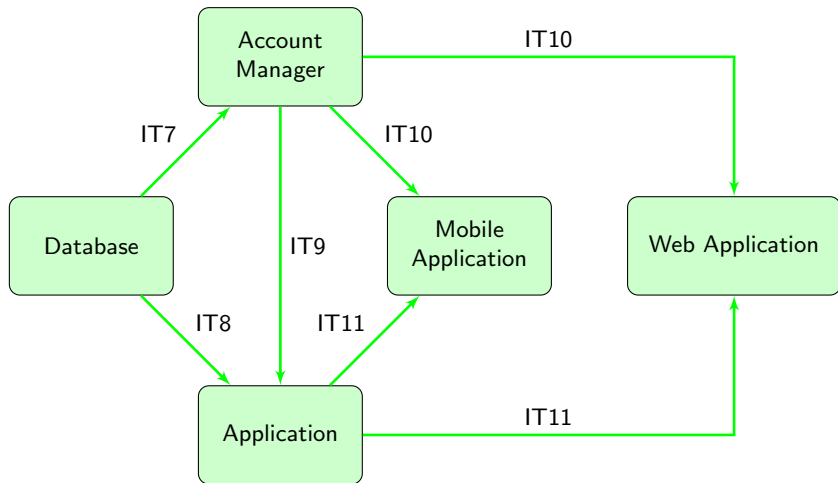
# Integration Steps - IT11

Global: Integration between Application and User Interface



# Integration Steps

Whole System Tested!



## 1 Requirement And Specification

- Scope
- User Interfaces
- The World and The Machine
- Use Cases
- Alloy

## 2 Design

- Component View
- Architectural Style

## 3 Integration Testing

- Overall View on Integration Components
- Integration Steps

## 4 Project Planning

- Function Points
- COCOMO
- Gantt Chart



# Function Points

Type	Detail	Simple	Medium	Complex	WEIGHTED SUM
ILFs	Clients	X			55
	Drivers	X			
	Ride	X			
	Drivers State and Position	X			
	Reservations	X			
	Queue		X		
	Zones		X		
	<b>TOTAL</b>	<b>5</b>	<b>2</b>	<b>0</b>	
EIFs	Driving Licences	X			12
	GPS Coordinates		X		
	<b>TOTAL</b>	<b>1</b>	<b>1</b>	<b>0</b>	
Inputs	Registration		X		29
	Login	X			
	Logout	X			
	Call Request			X	
	Reservation Request			X	
	Reservation Deletion		X		
	Change Driver State	X			
	<b>TOTAL</b>	<b>3</b>	<b>2</b>	<b>2</b>	
Outputs	Forwarded Call Request		X		26
	Call Confirmation	X			
	Forwarded Reservation Request		X		
	Reservation Confirmation	X			
	Reservation Rejection	X			
	Reservation Deletion	X			
	<b>TOTAL</b>	<b>4</b>	<b>2</b>	<b>0</b>	
Inquiry	Show Call Details		X		10
	Show Reservations List	X			
	Show Reservation Details	X			
	<b>TOTAL</b>	<b>2</b>	<b>1</b>	<b>0</b>	
<b>TOTAL</b>					<b>132</b>



## COCOMO II - Constructive Cost Model

**Software Size**      Sizing Method

Unadjusted  
Function Points       Language

**Software Scale Drivers**

Precedentedness       Architecture / Risk Resolution       Process Maturity

Development Flexibility       Team Cohesion

**Software Cost Drivers****Product**

Required Software Reliability

Data Base Size

Product Complexity

Developed for Reusability

Documentation Match to Lifecycle Needs

**Personnel**

Analyst Capability

Programmer Capability

Personnel Continuity

Application Experience

Platform Experience

Language and Toolset Experience

**Platform**

Time Constraint

Storage Constraint

Platform Volatility

**Project**

Use of Software Tools

Multisite Development

Required Development Schedule

**Results****Software Development (Elaboration and Construction)**

Effort = 16.8 Person-months

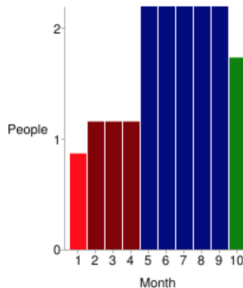
Schedule = 9.3 Months

Cost = \$0

Total Equivalent Size = 6996 SLOC

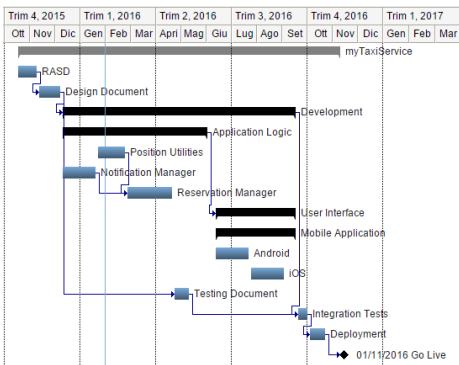
**Acquisition Phase Distribution**

Phase	Effort (Person-months)	Schedule (Months)	Average Staff	Cost (Dollars)
Inception	1.0	1.2	0.9	\$0
Elaboration	4.0	3.5	1.2	\$0
Construction	12.8	5.8	2.2	\$0
Transition	2.0	1.2	1.7	\$0

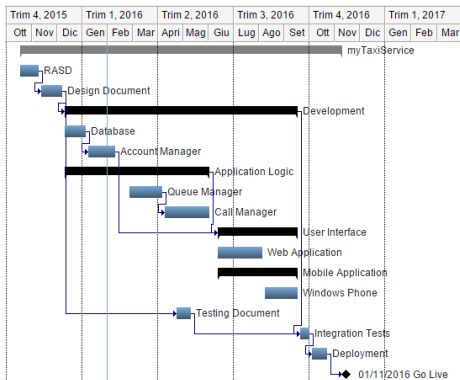
**Staffing Profile****Software Effort Distribution for RUP/MBASE (Person-Months)**

Phase/Activity	Inception	Elaboration	Construction	Transition
Management	0.1	0.5	1.3	0.3
Environment/CM	0.1	0.3	0.6	0.1
Requirements	0.4	0.7	1.0	0.1
Design	0.2	1.5	2.0	0.1
Implementation	0.1	0.5	4.3	0.4
Assessment	0.1	0.4	3.1	0.5
Deployment	0.0	0.1	0.4	0.6

# Gantt Chart



Jacopo's tasks



Luca's tasks

