Modélisation du cycle de vie des Objets

Ressource R3.03 — Analyse

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UML

Dans ce module

- **Specification**
  - Besoins des utilisateurs (diag. cas d'utilisations)
  - Interaction Utilisateur <-> Logiciel (diag. séquence)
- **Conception**
  - Structure interne du logiciel (diag. classes)
  - État interne du logiciel à l'instant T (diag. objets)
  - **Évolution des objets (diag. états-transitions)**
  - Interaction des objets (diag. séquence)

UML

Les diagrammes

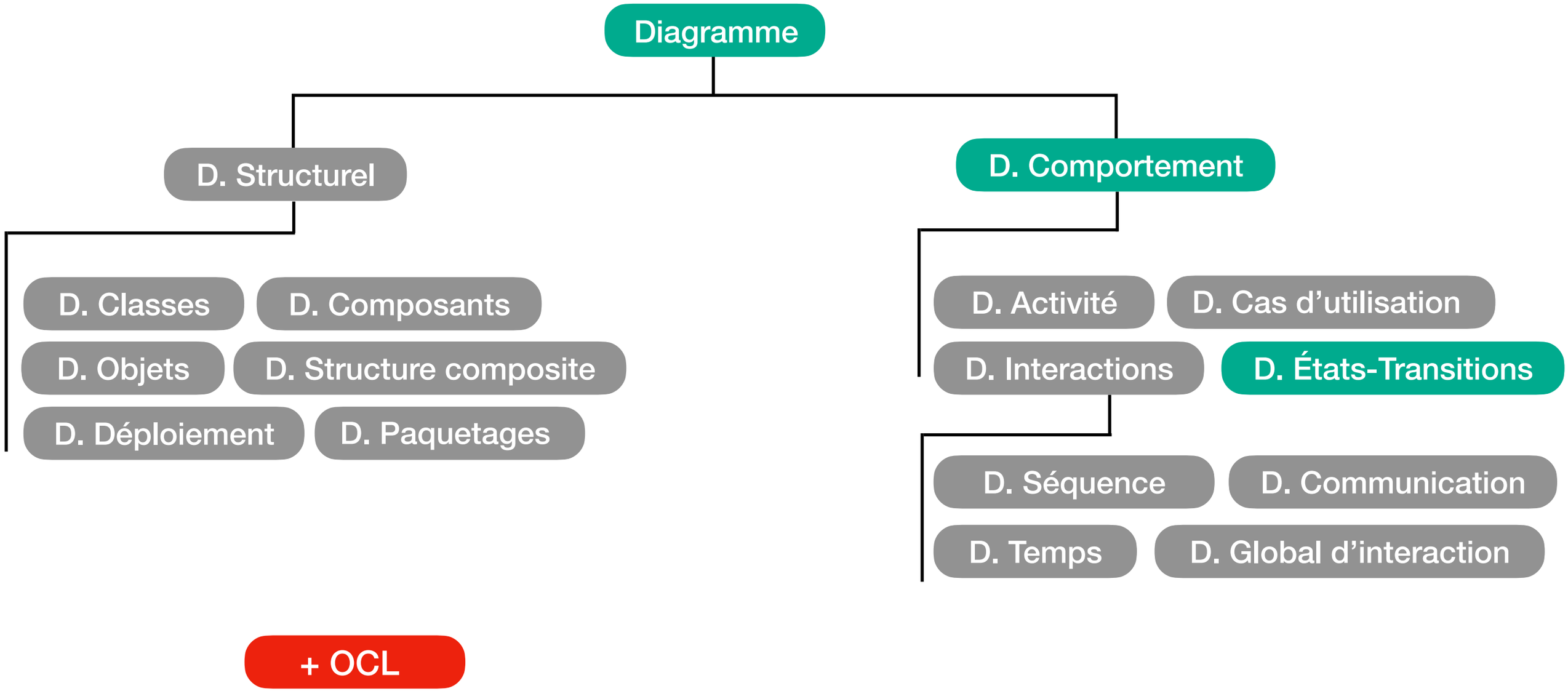

Diagramme d’états-transition

Définition

Diagramme d’états-transition

Définition

- Représentation du cycle de vie d’une entité (les objets généralement)
- Description des états et des transitions qui les lient, ainsi que les événements qui déclenchent les changements d’états

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- Représentation graphique

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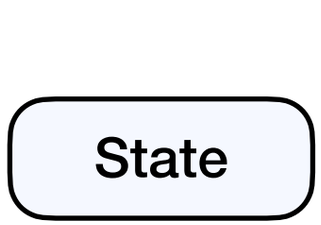

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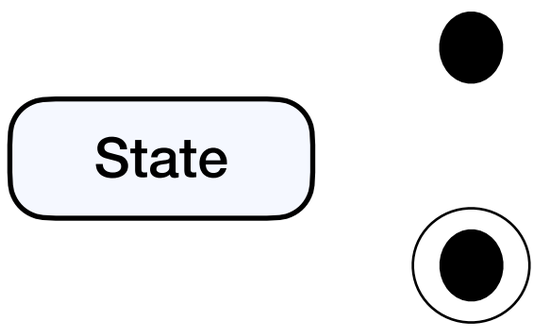

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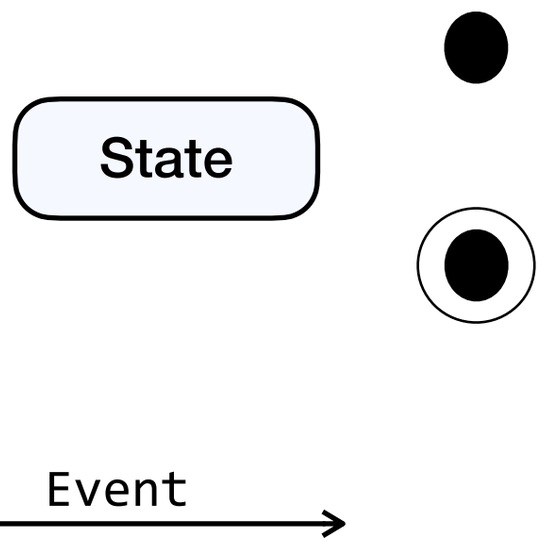
  - Événement / transition

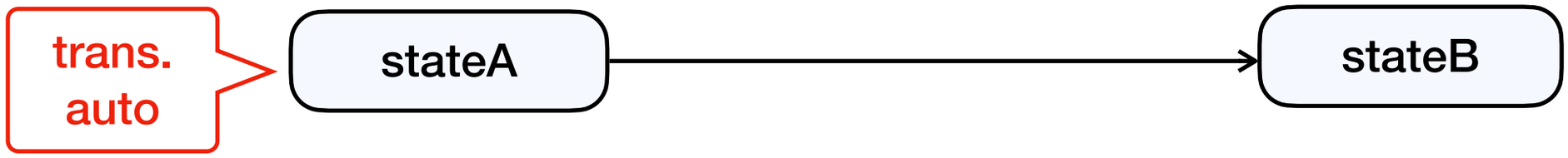


Etats-Transitions

Événements / transitions

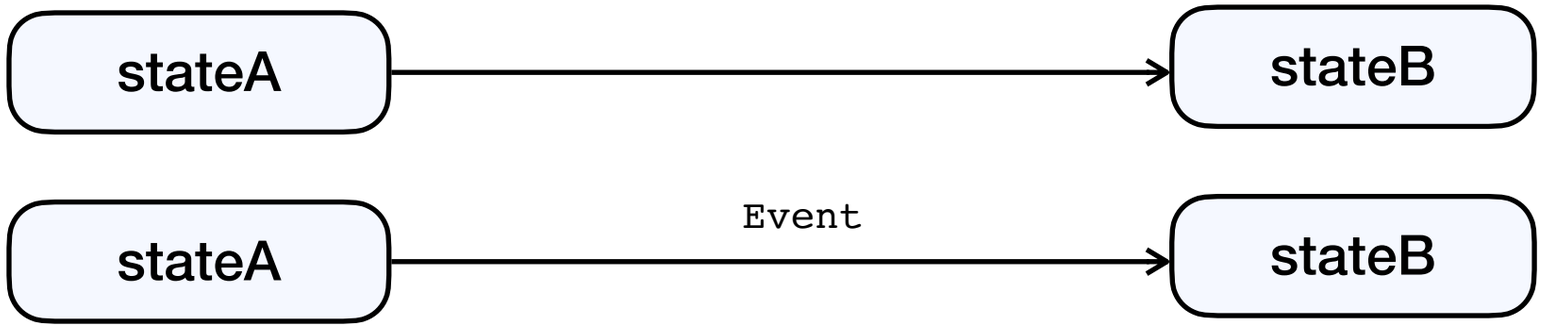
Etats-Transitions

Événements / transitions



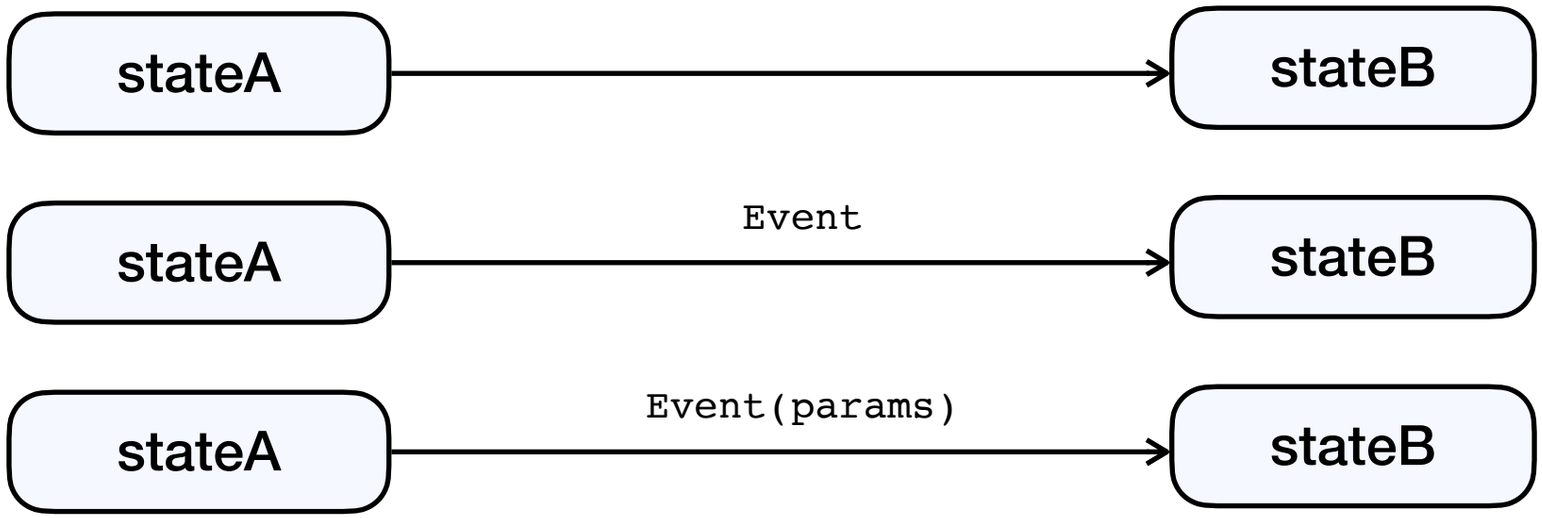
Etats-Transitions

Événements / transitions



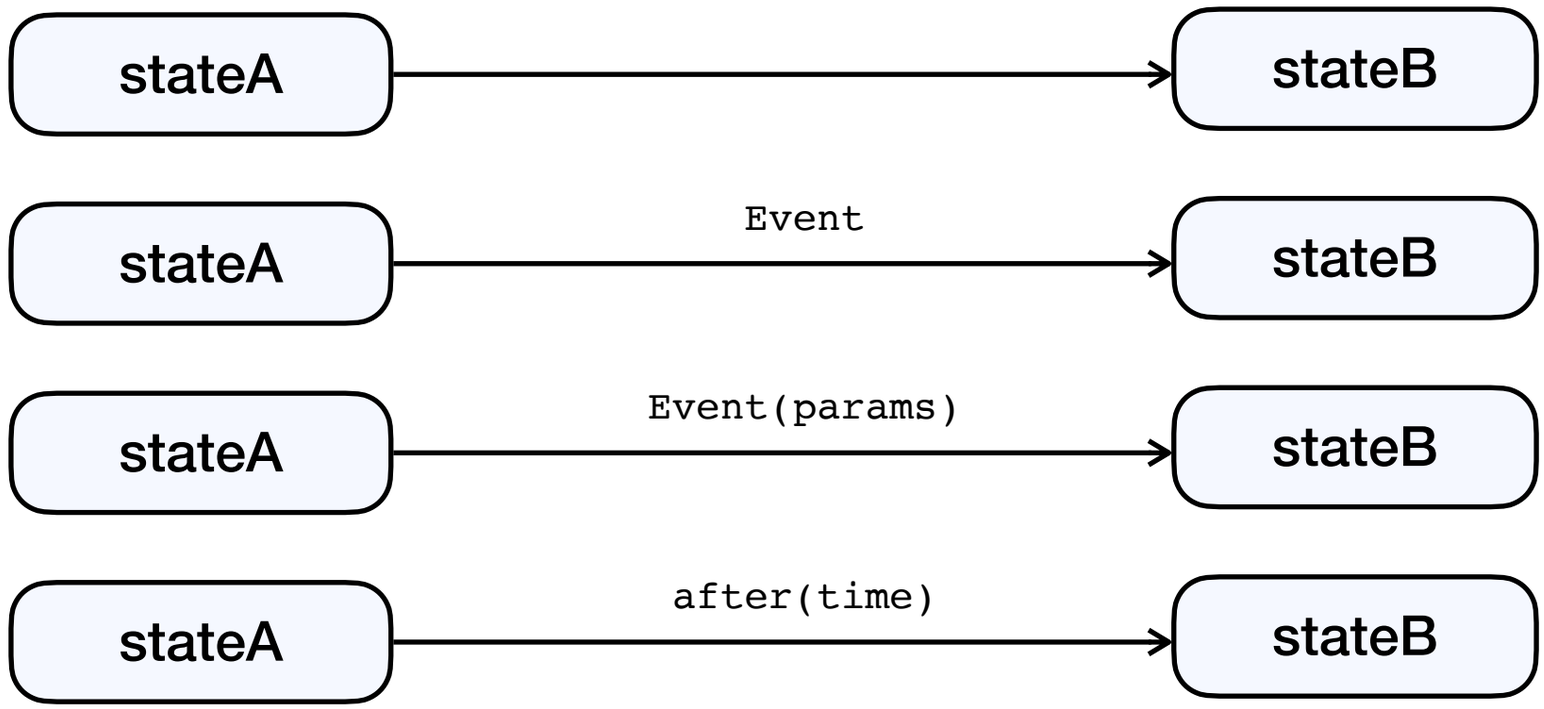
Etats-Transitions

Événements / transitions



Etats-Transitions

Événements / transitions



Etats-Transitions

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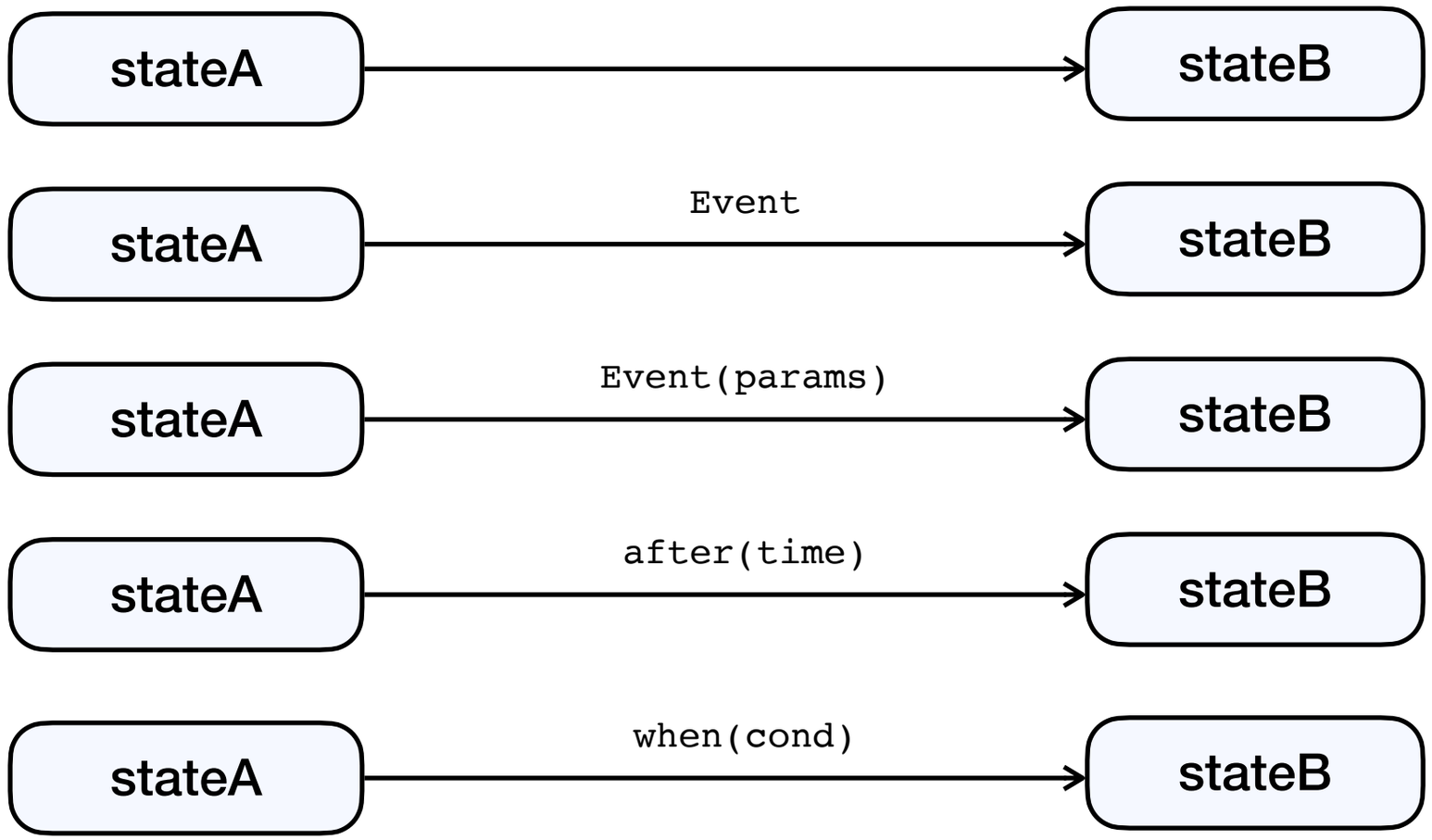
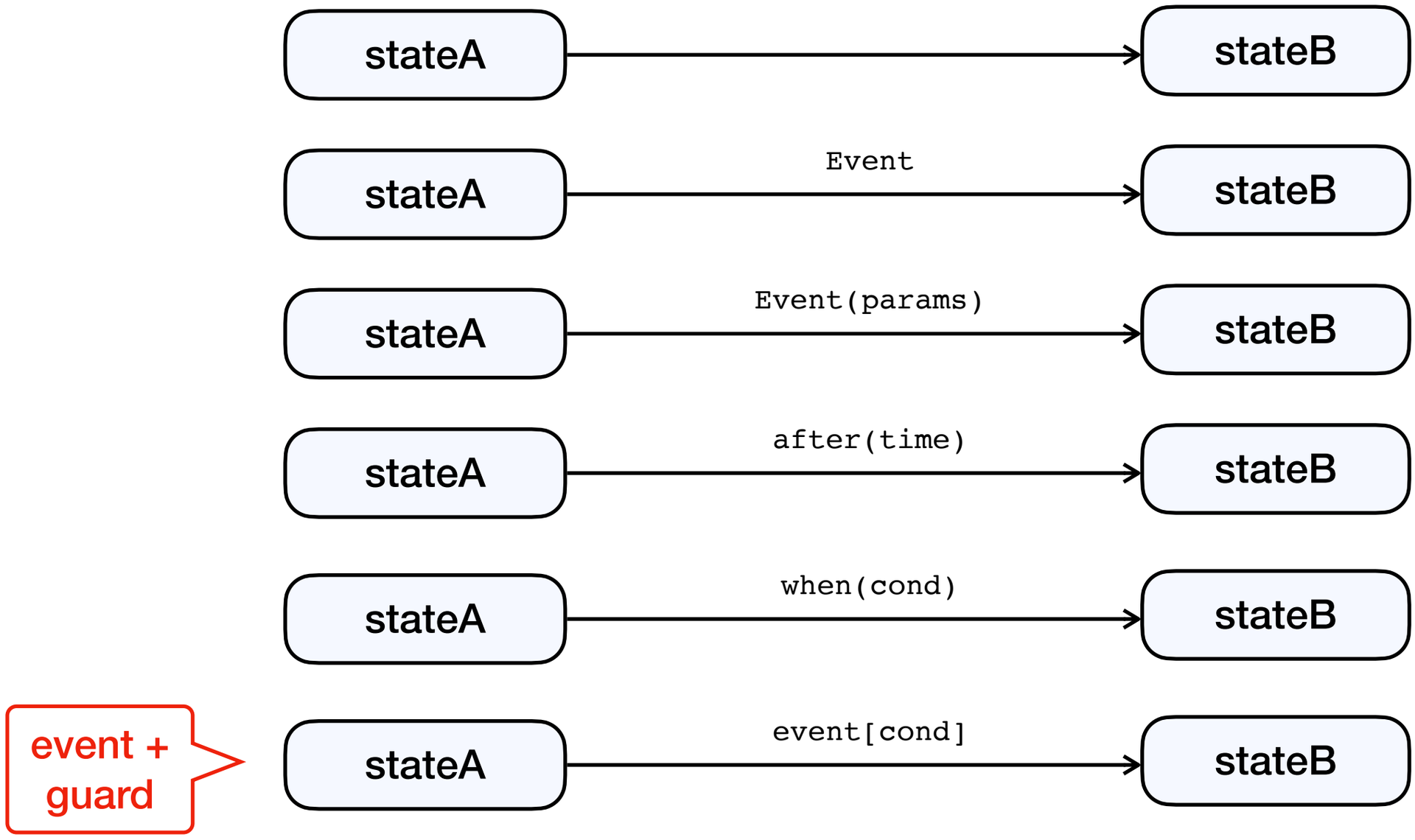


Etats-Transitions

Événements / transitions



Etats d’un objet

Exemple

Etats d’un objet

Exemple

AlarmClock
alarmON: boolean ringing: boolean alarm: HOUR

Etats d’un objet

Exemple

<<enuremation>> HOUR
6:00 7:00 9:00

AlarmClock
alarmON: boolean ringing: boolean alarm: HOUR

Etats d’un objet

Exemple

<<enuremation>> HOUR
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AC: AlarmClock

Etats d’un objet

Exemple

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6:00 7:00 9:00

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AC: AlarmClock

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state1: alarmON = true; ringing = true; alarm = 6:00
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```

Etats d’un objet

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alarmON: boolean ringing: boolean alarm: HOUR

AC: AlarmClock

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state3: alarmON = true; ringing = true; alarm = 9:00

state4: alarmON = true; ringing = false; alarm = 6:00
state5: alarmON = true; ringing = false; alarm = 7:00
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Etats d’un objet

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state7: alarmON = false; ringing = false; alarm = 6:00
state8: alarmON = false; ringing = false; alarm = 7:00
state9: alarmON = false; ringing = false; alarm = 9:00
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Etats d’un objet

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state9: alarmON = false; ringing = false; alarm = 9:00

state10: alarmON = false; ringing = true; alarm = 6:00
state11: alarmON = false; ringing = true; alarm = 7:00
state12: alarmON = false; ringing = true; alarm = 9:00
```

Etats d’un objet

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Etats d’un objet

Exemple

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```
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state5: alarmON = true; ringing = false; alarm = 7:00
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```

```
state7: alarmON = false; ringing = false; alarm = 6:00
state8: alarmON = false; ringing = false; alarm = 7:00
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Etats d’un objet

Exemple

Sonnerie

- `state1: alarmON = true; ringing = true; alarm = 6:00`
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- `state3: alarmON = true; ringing = true; alarm = 9:00`

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Etats d’un objet

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Armé

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Etats d’un objet

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Sonnerie

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Armé

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Désarmé

```
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Transitions

Exemple

Sonnerie

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state4: alarmON = true; ringing = false; alarm = 6:00
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Exemple

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Sonnerie

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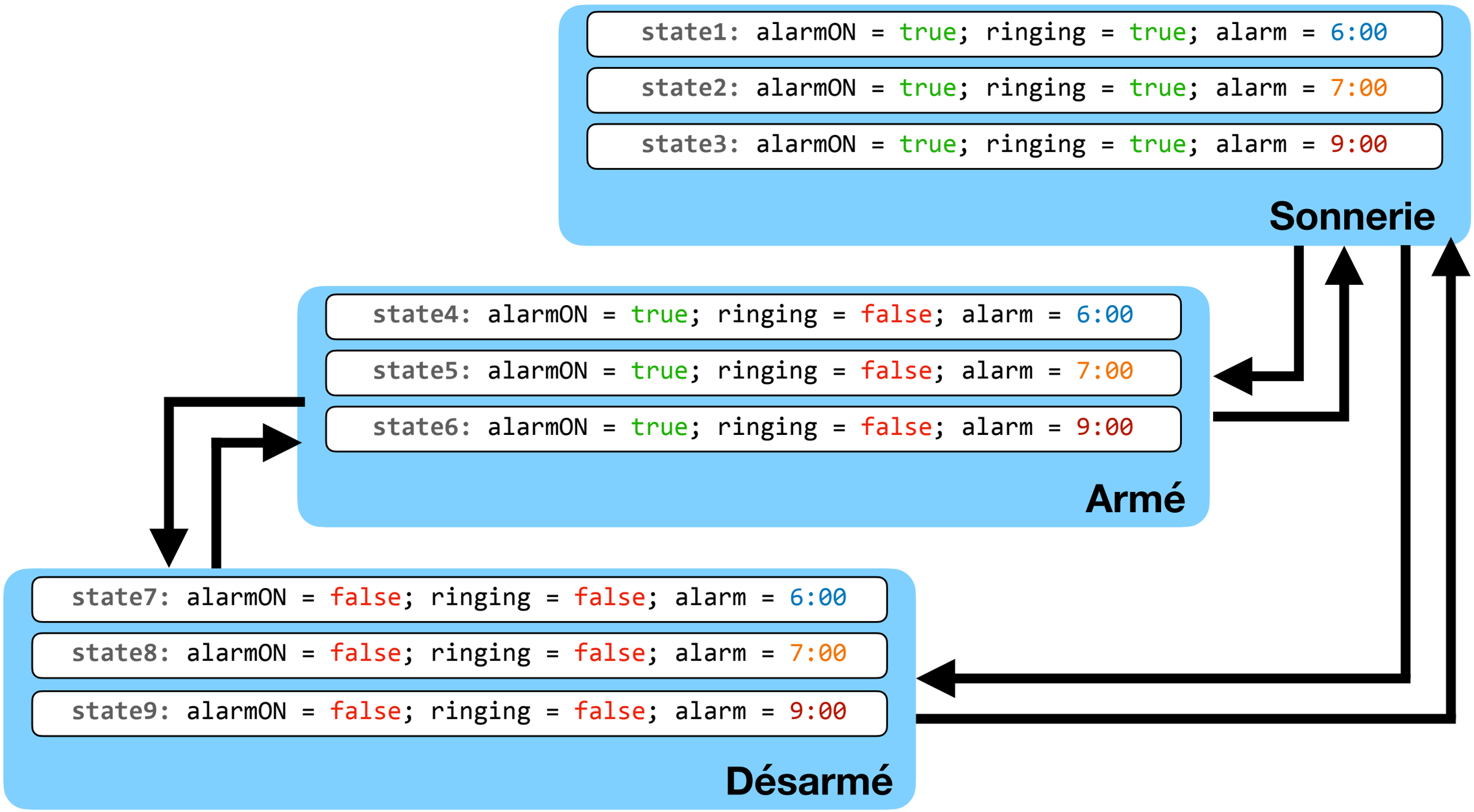
Désarmé

Transitions

Exemple



Transitions

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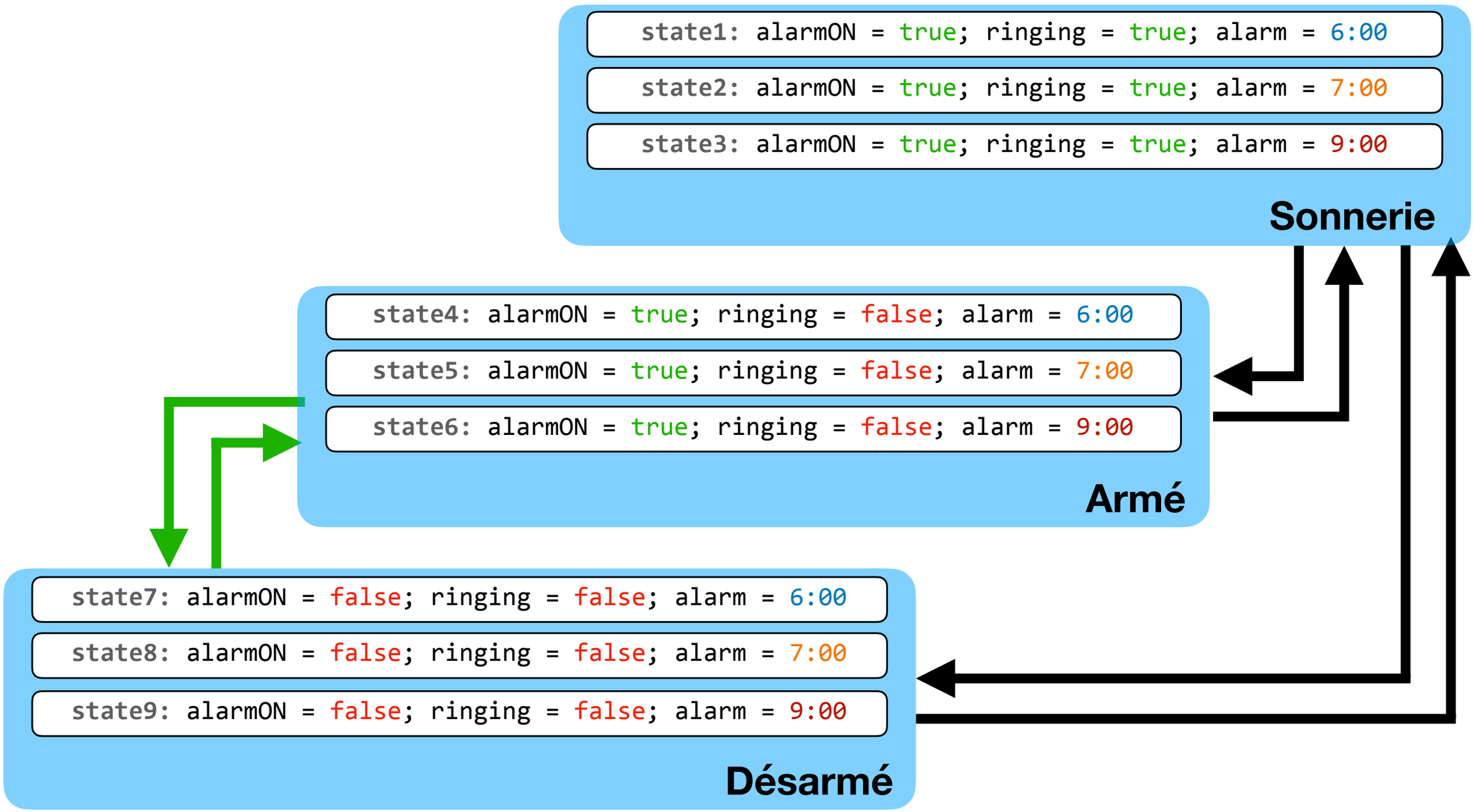
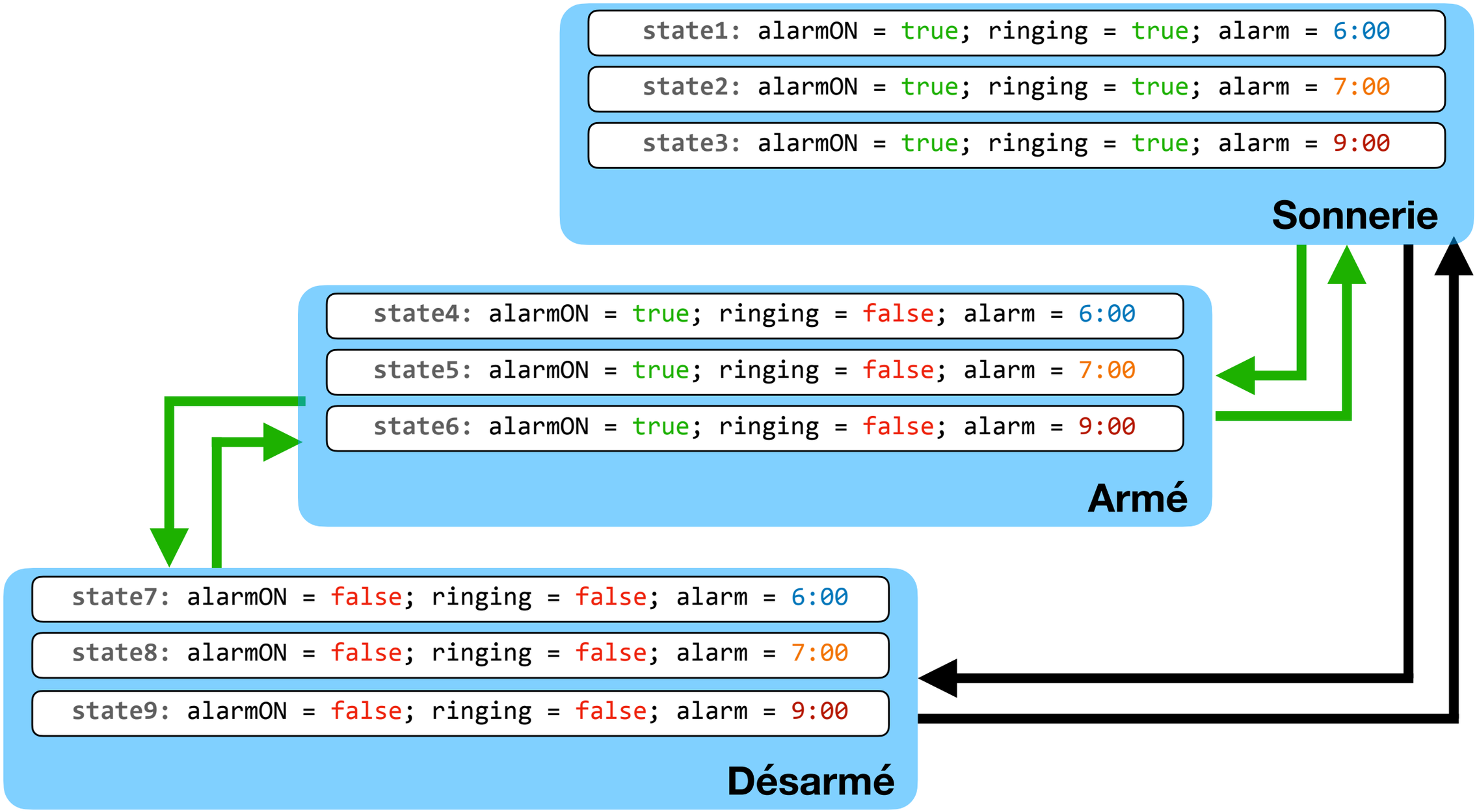


Transitions

Exemple



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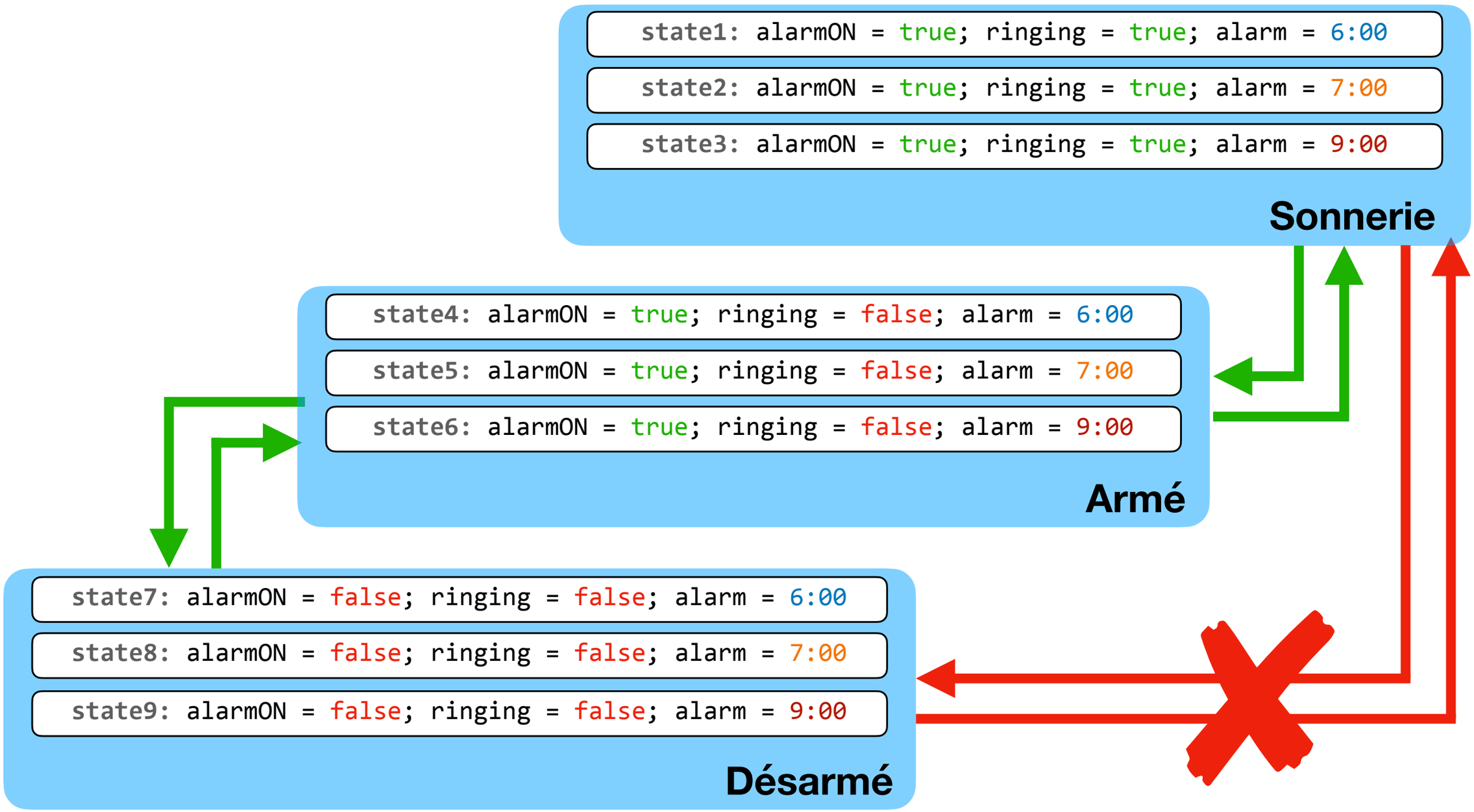

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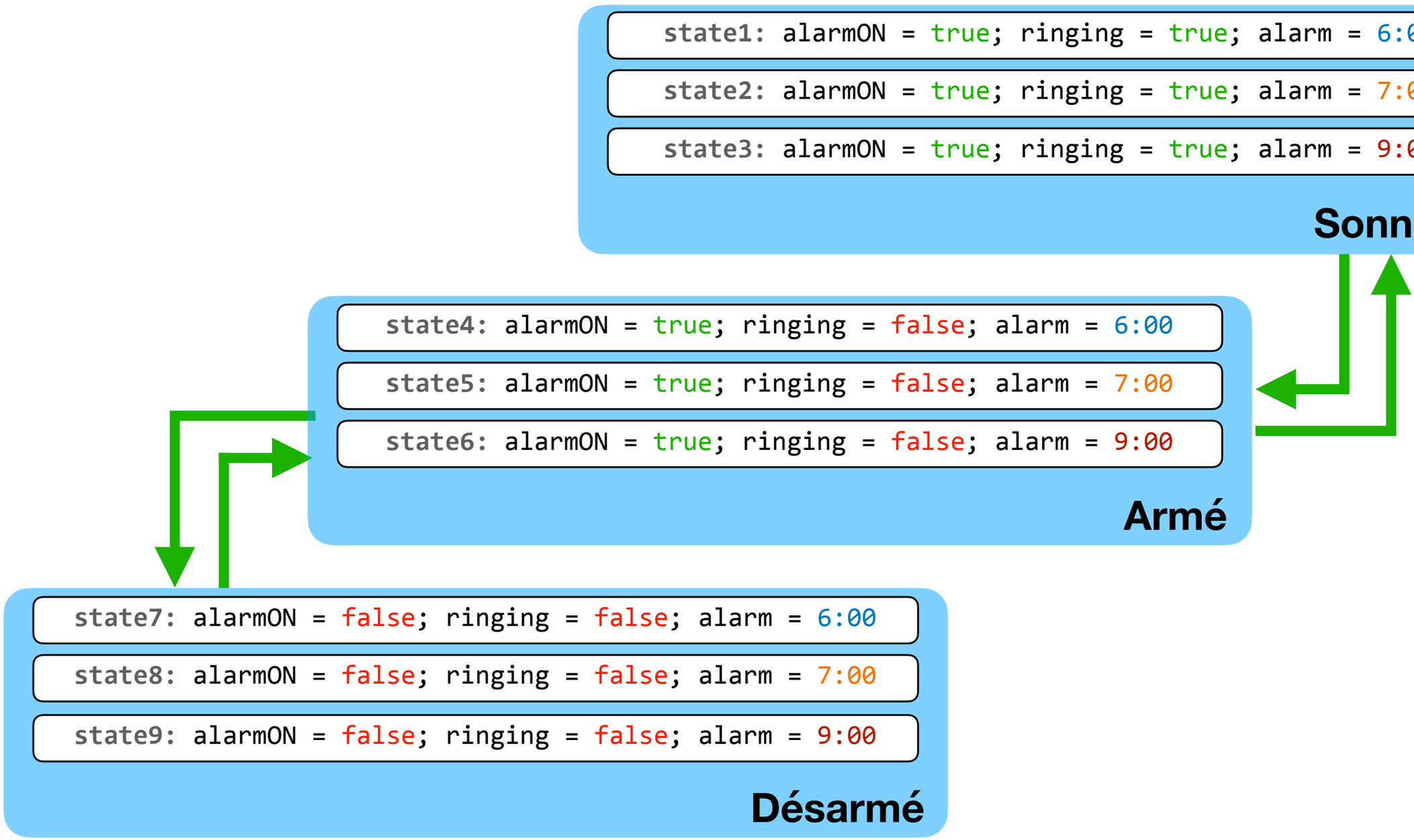
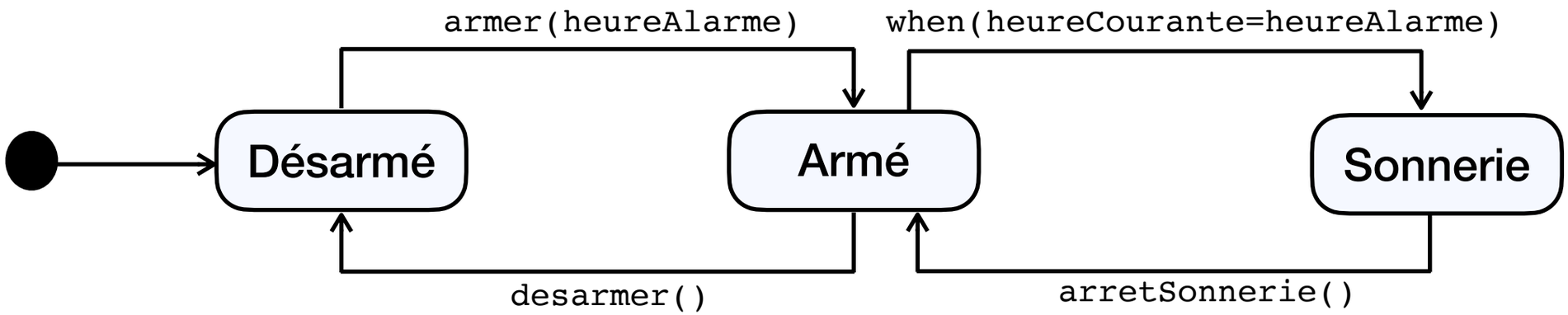


Etats-Transitions

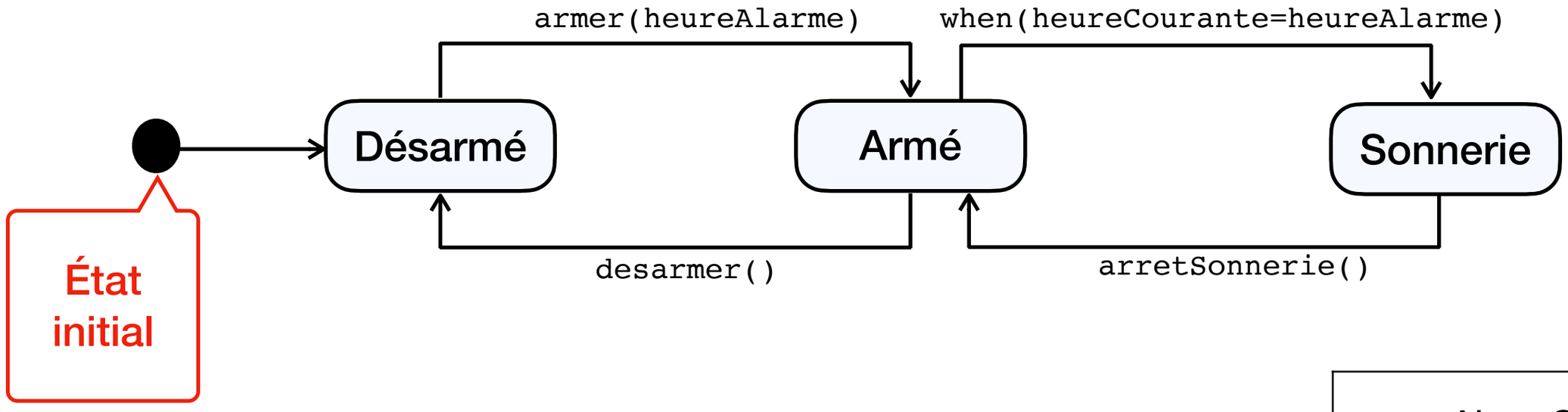
Syntaxe



AlarmClock
alarmON: boolean ringing: boolean alarm: HOUR

Etats-Transitions

Syntaxe



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Etats-Transitions

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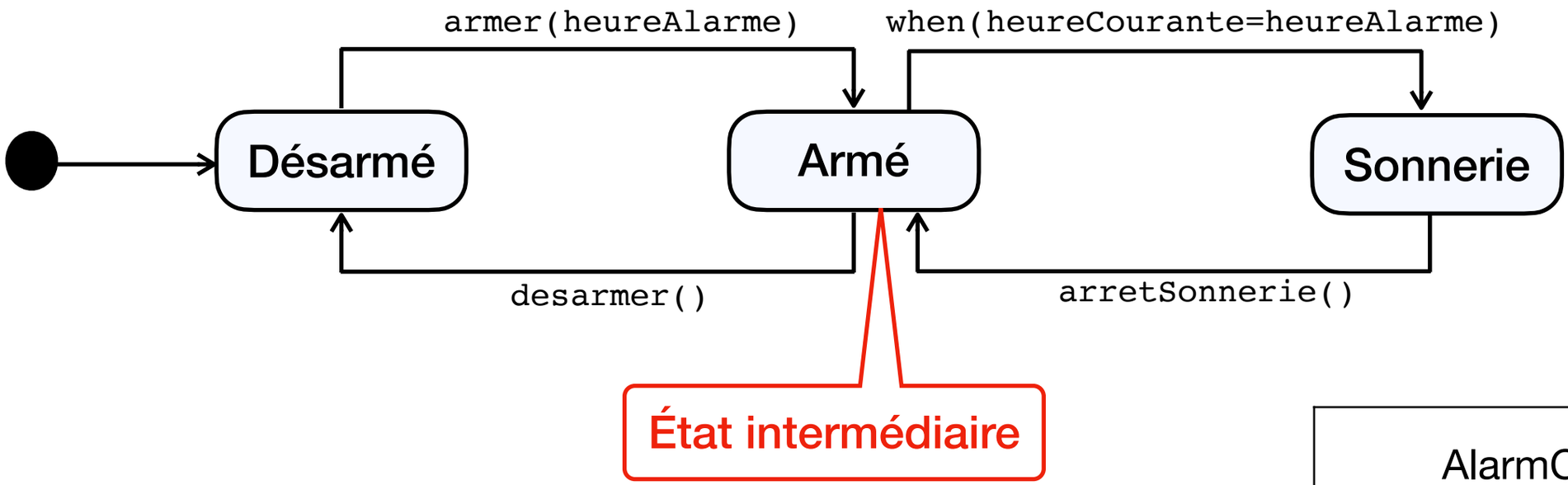

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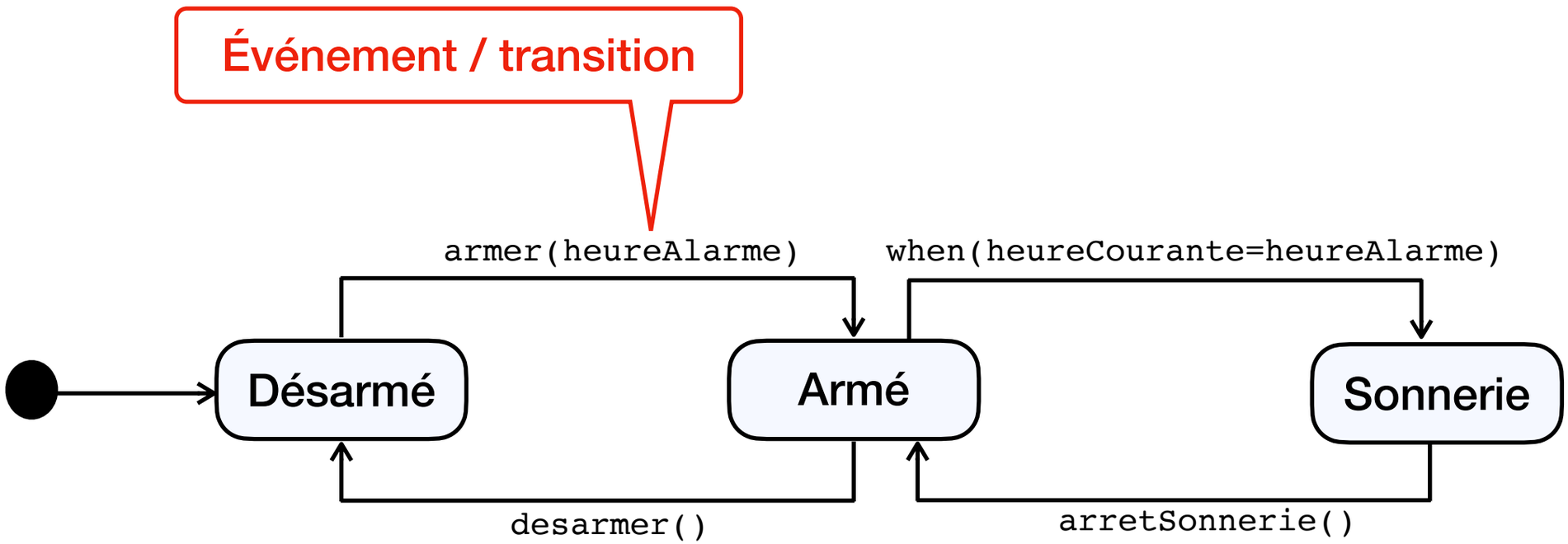

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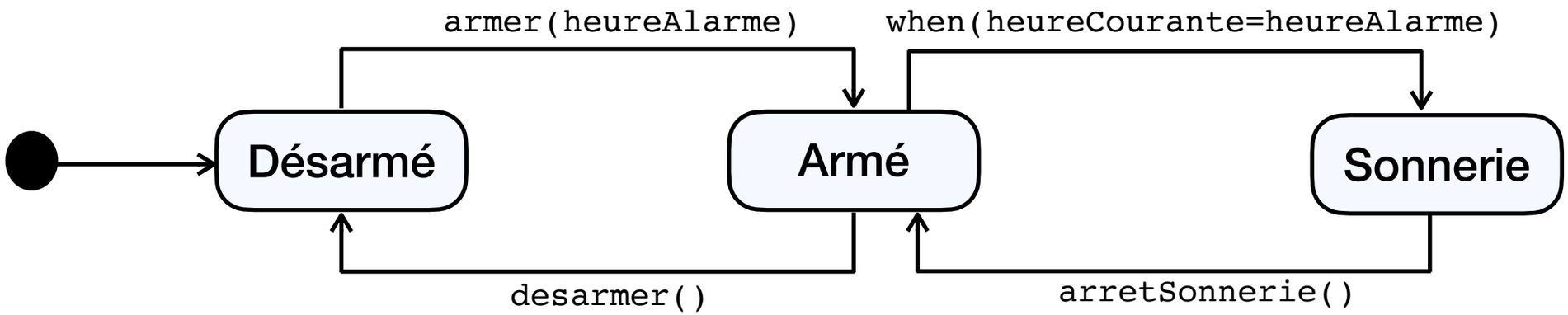

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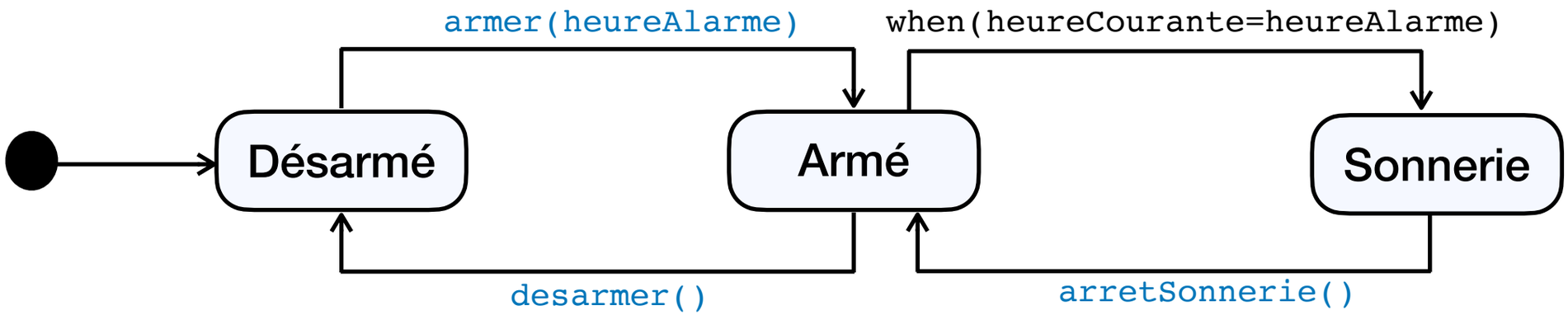
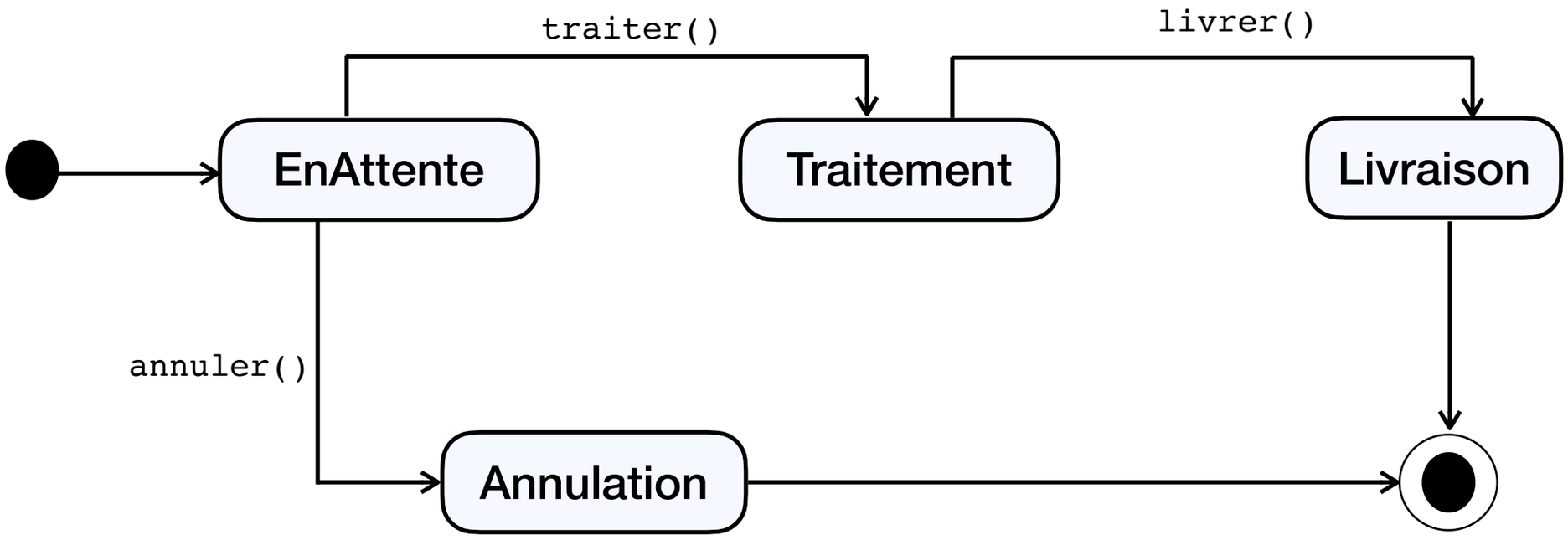


AlarmClock
alarmON: boolean ringing: boolean alarm: HOUR
armer(heureAlarme) desarmer() arretSonnerie()

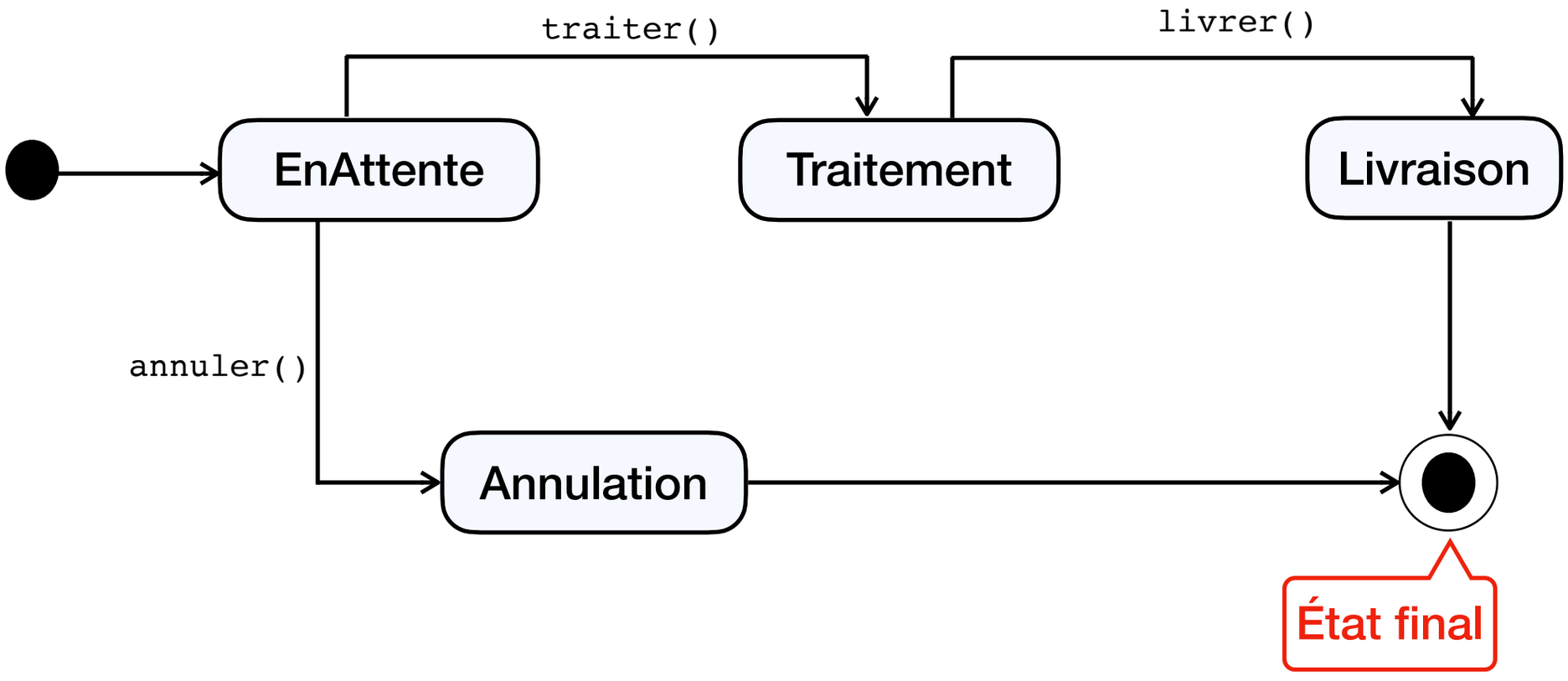
Etats-Transitions

Commande



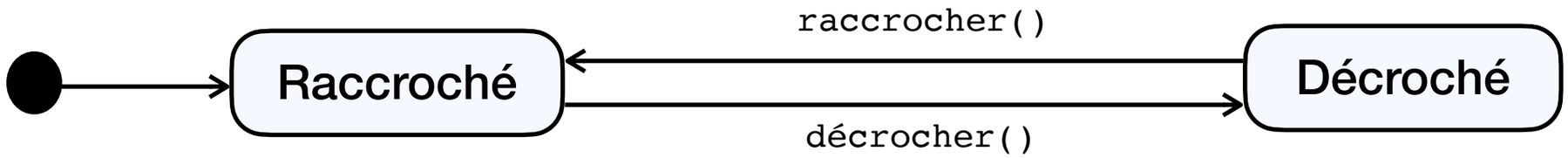
Etats-Transitions

Commande



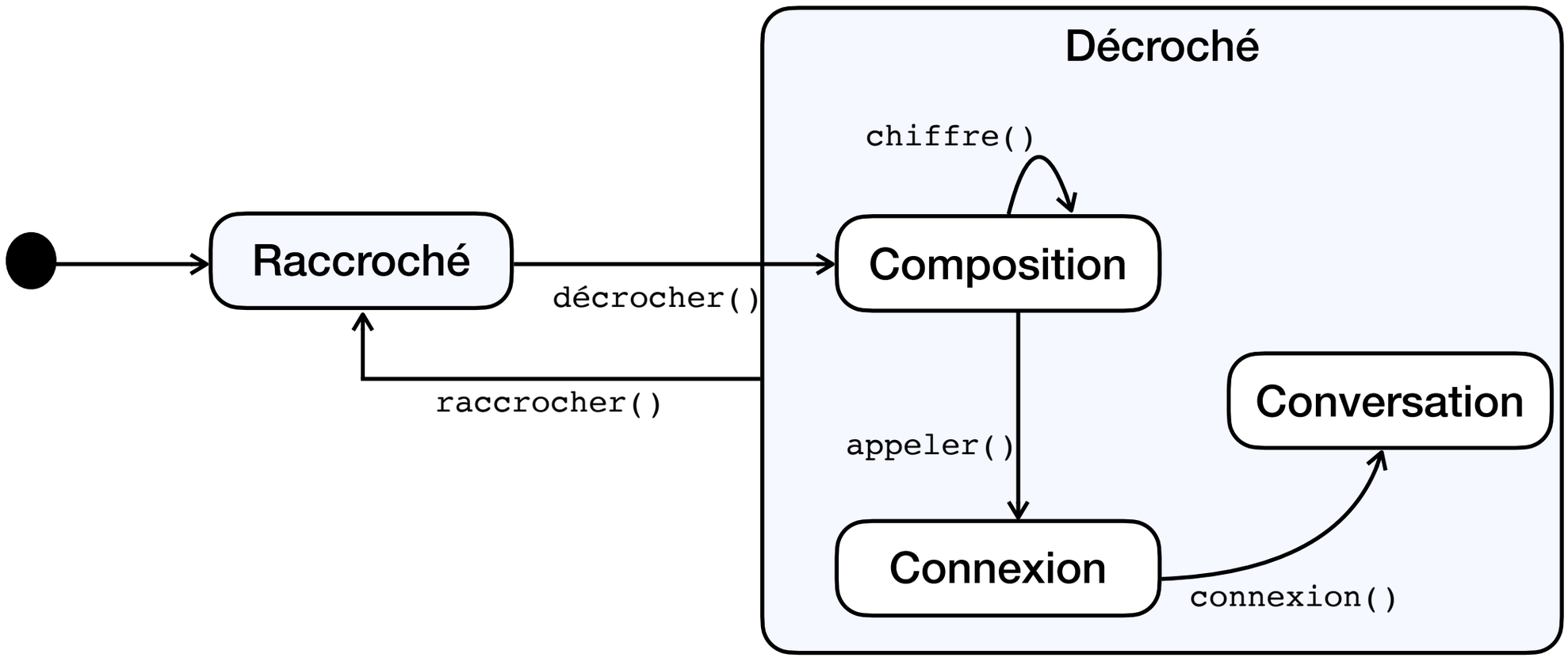
État composite

Téléphone (1/3)



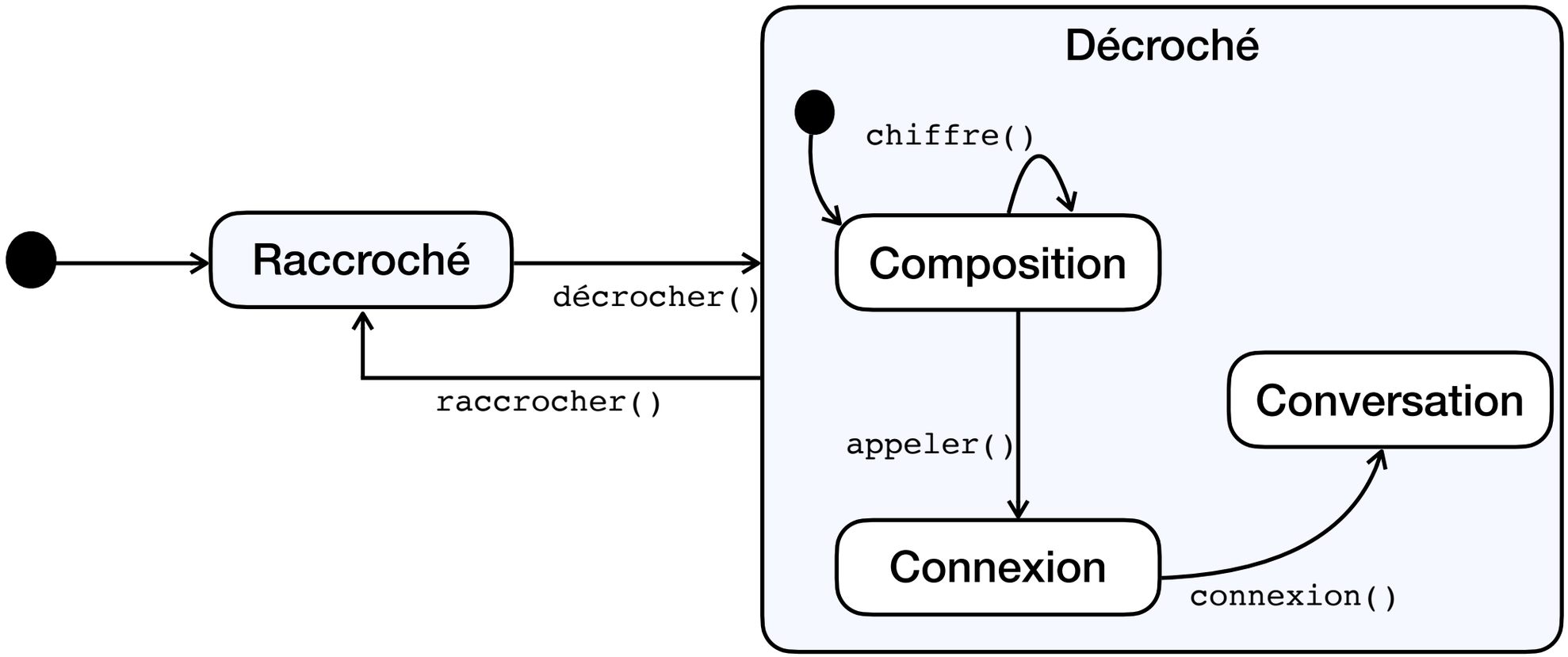
État composite

Téléphone (2/3)



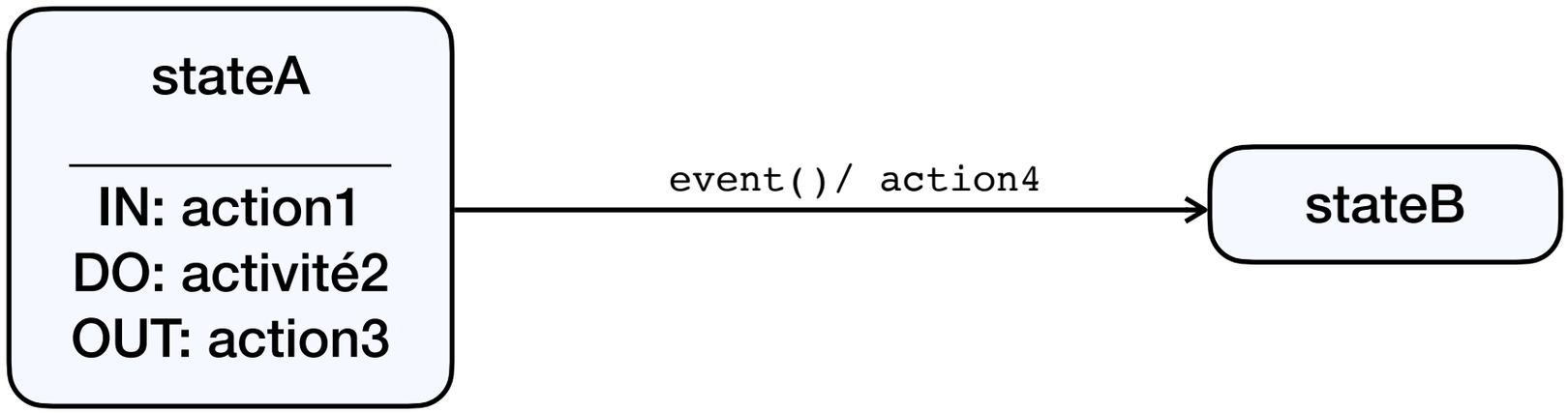
État composite

Téléphone (3/3)



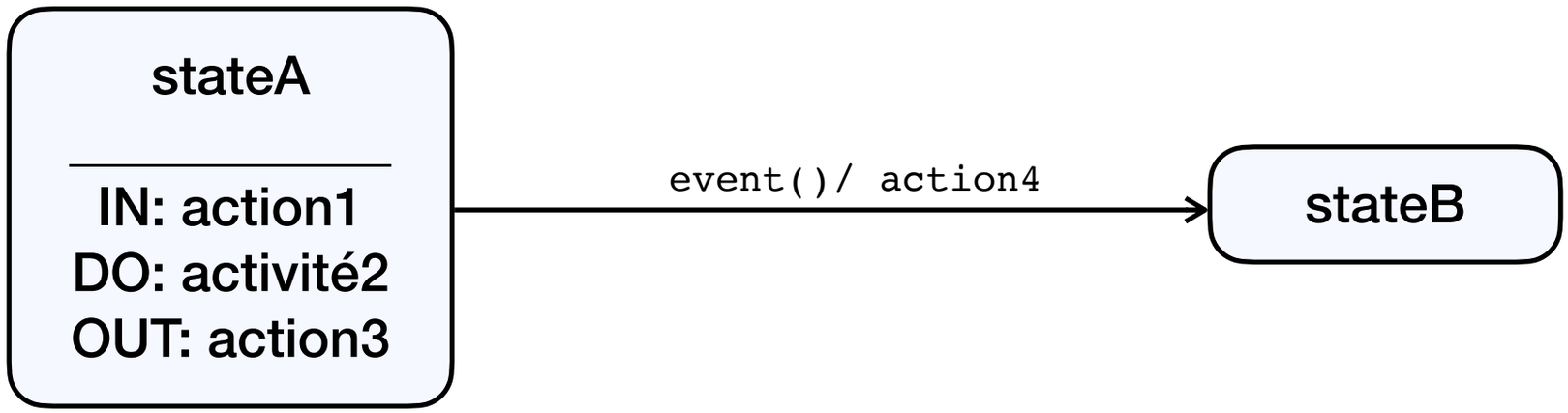
Notations avancées

Actions et activités



Notations avancées

Actions et activités




```
Action1 -> activité2 -> action3 -> action4
```

Références

Books

- **UML Distilled (Third Edition): A Brief Guide to the Standard Object Modeling Language.** M Fowler 2004.

- **Object-Oriented Software Engineering (Second Edition): Practical Software Development Using UML and Java.** T. Lethbridge and R. Laganière 2005.

- **UML in Practice: The Art of Modeling Software Systems Demonstrated through Worked** P. Rogues 2004.

- **Requirements Engineering: From System Goals to UML Models to Software Specifications.** A. Lamsweerde 2009.

- **Software Engineering with UML.** B. Unhelkar 2018.

Many

Thanks to

Noureddine Aribi II Sébastien Bardin II Nassim Belmecheri II
Kevin Chapuis II Pierre Gérard II Arnaud Gotlieb II Marianne Huchard II
Laurent Jean-Pierre II Alain Joubert II Yahia Lebbah II
Delphine Longuet II Samir Loudni II Sophie Nabitz II
Clémentine Nebut II Matthieu Rosenfeld II Alain Sabatier II
Helmut Simonis II Djamel Seriai II Christine Solnon II
Julie Vachon II Petru Valicov II Keunhyuk Yeom II Raphael Yende