



THE UNIVERSITE JOSEPH FOURIER JAVA CARD SYSTEM AT IMAG

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Grenoble, one of the first research locations in France

4 universities

50 500 students

9 000 staff

A research oriented site

200 laboratories

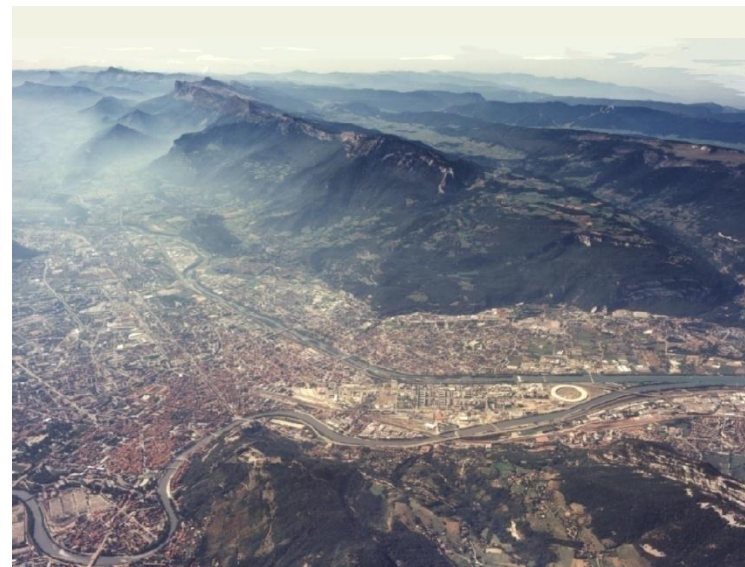
3000 Ph D students

An international dimension

7000 foreign students

partners in **70** countries

5 european labs





Some numbers about the cards (for students)

- 50 000 student cards
 - 19 000 public transportation cards
 - 27 000 CROUS (student's restaurant) cards
- Turnover per year:
- 1/3 of new student cards
 - 1/3 of new transportation cards



The benefits of a single card

- **Students: simplified procedures**
- **Staff: transportation, parking, access to buildings,...**
- **Incentive to the use of public transportation**
- **Reducing costs (~ 100 k € per year for the cards)**
- **A modern image**



2009: A pilot site

- UFR Informatique et Mathématiques Appliquées (IMAG),
Université Joseph Fourier
 - 1 000 students
 - 500 staff
- Choice of a Java Card
- The CROUS has its own “Moneo” card since 2008



Aims of the Java Card project

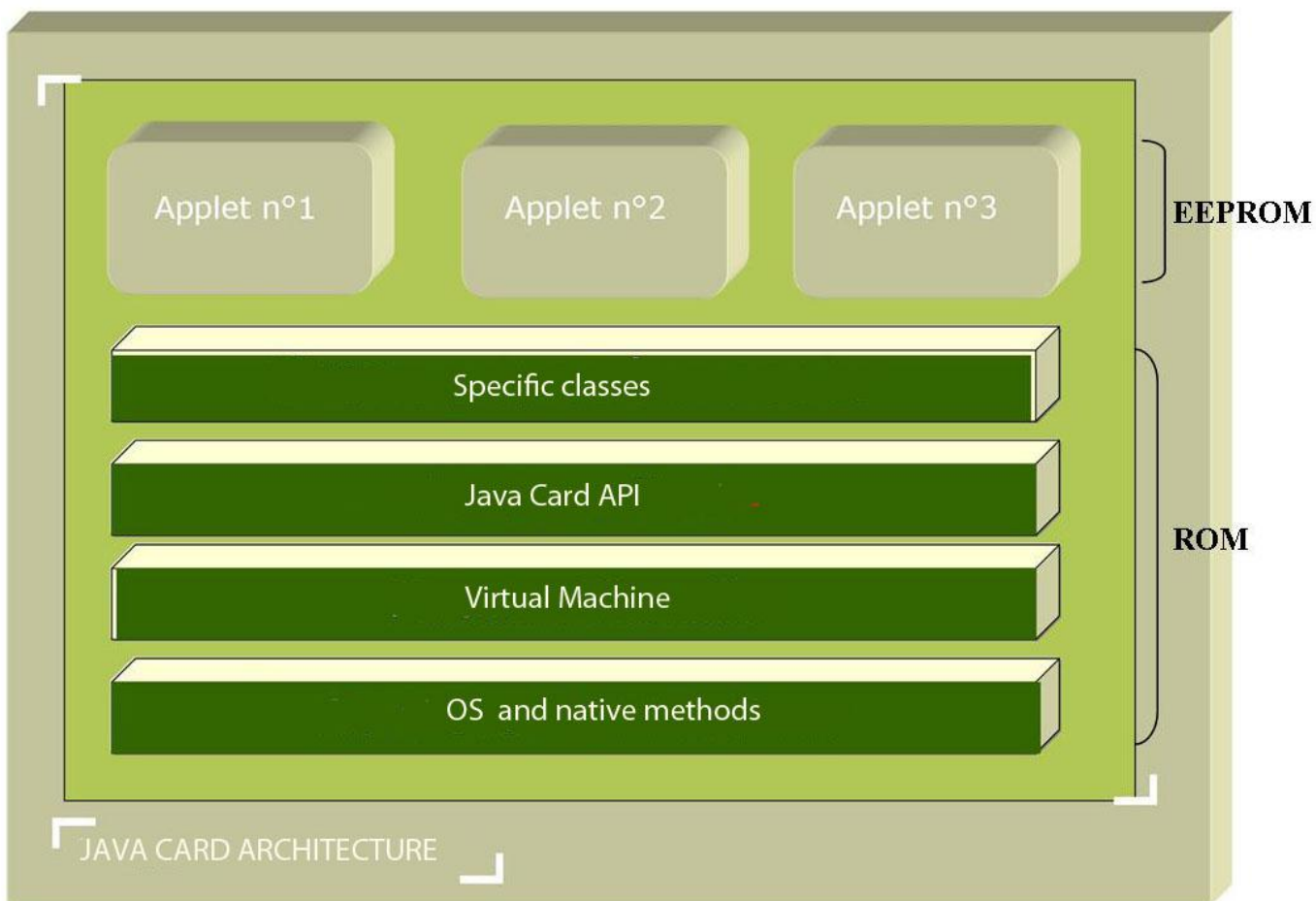
- In the Rhône-Alpes region, an innovative and enduring project, insisting on multi-application aspects and security
- Card not limited to 3 years (as Moneo is)
- Issued by the University
- Better price than Moneo



Choice of the Java Card technology

- Java Card: card with a Java processor and system
- Multi-application nature: dynamic applets loading
- Sécurité:
 - Security of the Java language: strongly typed, class loader, verification byte code, encrypted libraries...
 - Security at the card software level: PIN code authentication, atomicity of transactions, encryption algorithms (SHA, DES, RSA), independance of transactions
 - Security at the card hardware level: special fonctions as the encryption coprocessor

Java Card Architecture





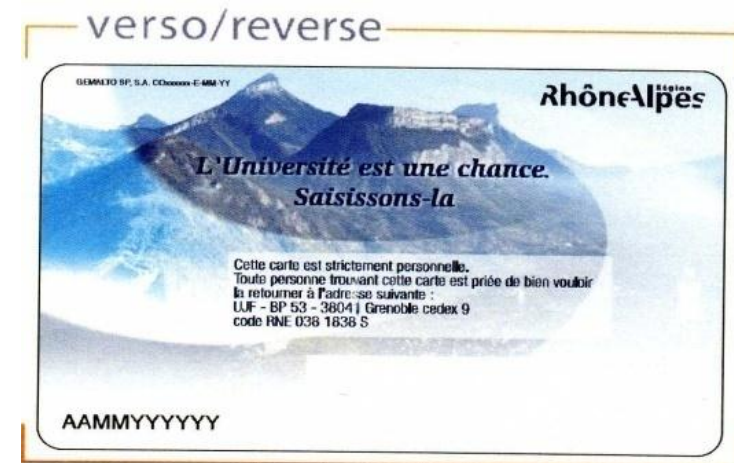
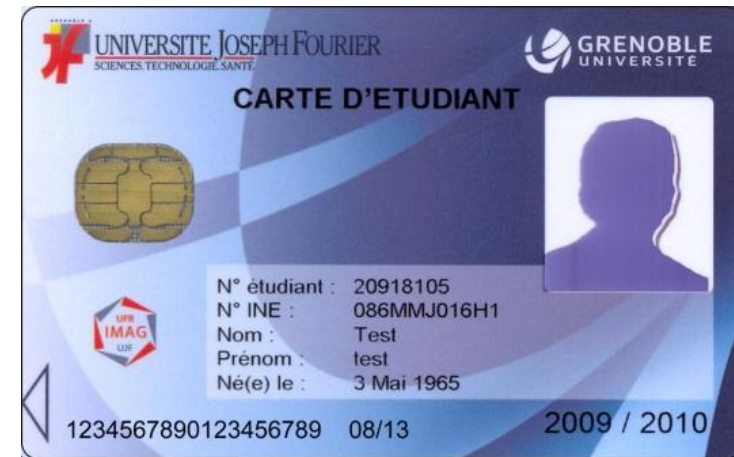
Type of the chosen card

- Dual card (1 processor and 2 interfaces) from Gemalto
 - Contact: standard iso-7816
 - Contactless: standard iso-1443A & B
- Chipset Infineon certified Mastercard and Visa
- EEPROM : 68kbyte (1 applet = 10 à 15 ko)
- Standards :
 - Global Platform 2.1.1 specifications for cards and application management regardless of environment or technology
 - Java Card 2.1.1 specifications concerning Java Card API, Java Card Runtime Environment, Java Card Virtual Machine



Visual and applets

- Student card & staff card visuals
- Existing services
 - Access to rooms and buildings
 - Use of SUN RAY terminals
 - Campus restaurants
- Futur services
 - Public Transportation
 - Examinations
 - Certification X509 ?
- First in France with Java technology



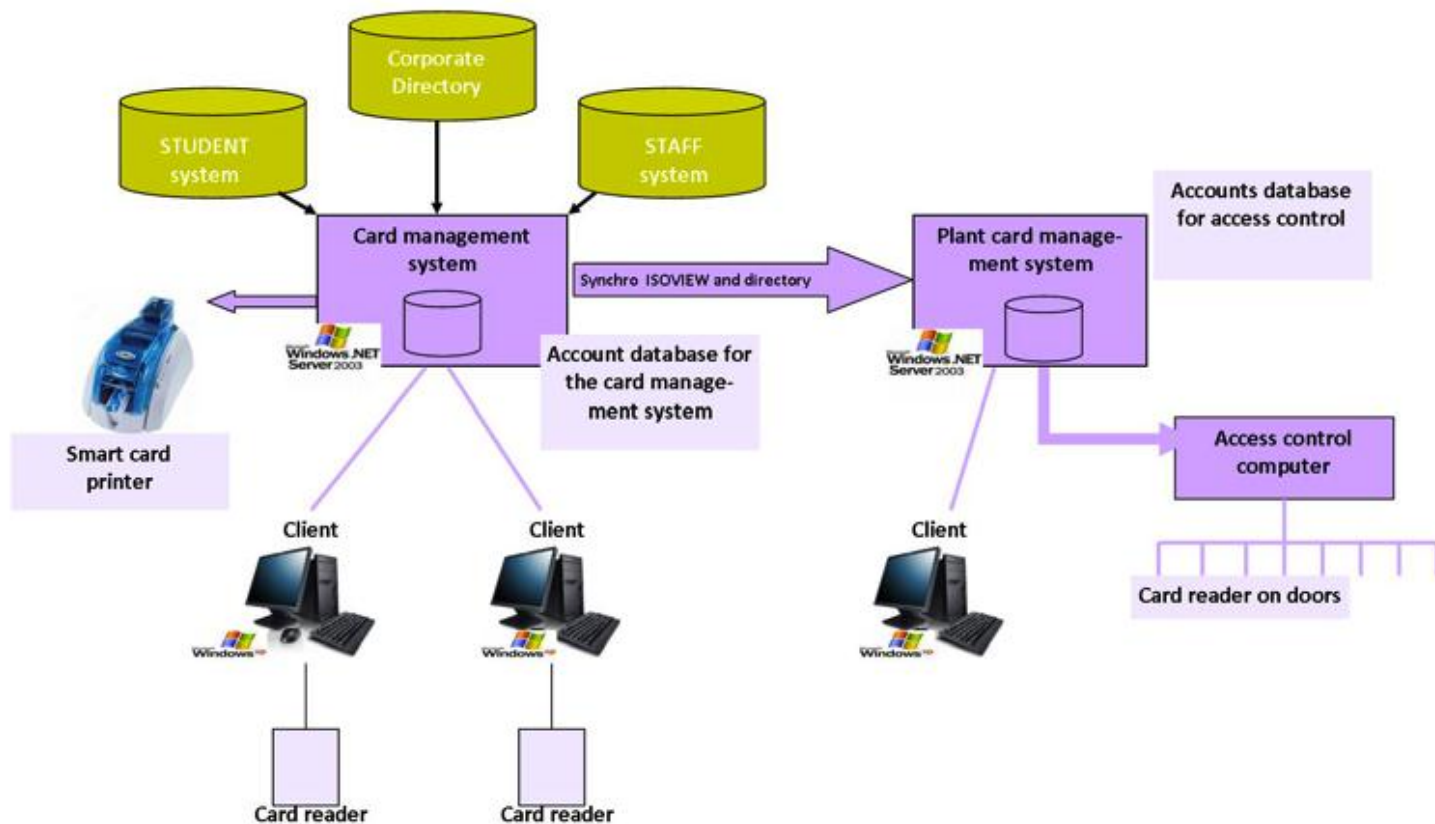


Moneo on Java Card

- Pilot experiment in 2010/2011: 500 cards on one restaurant
- Join Project UFR IMAG/UJF , DSI-GU, Moneo, Banque CIC, Gemalto, CROUS
- Validated by Banque de France (june 2011)
- Choice of Moneo by the student when registrates
- 500 cards



Card Management System





Conclusion & Challenges

- A good answer to expected services
- Reliability of system and cards
- Users are happy
- Mature Java card technology
- Decreasing price
- A number of possible applications
- *Find partners in transportation*
- *Beyond technology, legal aspects with multiple partners (authority, sécurité, legal responsibility...)?*