The Mobile Java Card™ Grid Project

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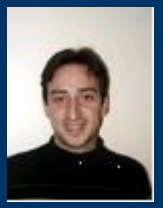
AGENDA

- Members of the project
- The Original Java Card Grid
  - Overview
  - Applications
- The Mobile Java Card Grid
  - Overview
  - Framework
  - Challenges
  - Future applications
- Conclusions & Perspectives
- Thanks

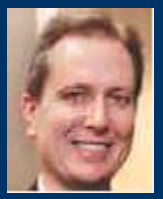
MEMBERS

Smart Card Centre
Royal Holloway

Royal Holloway
University of London



- Konstantinos Markantonakis



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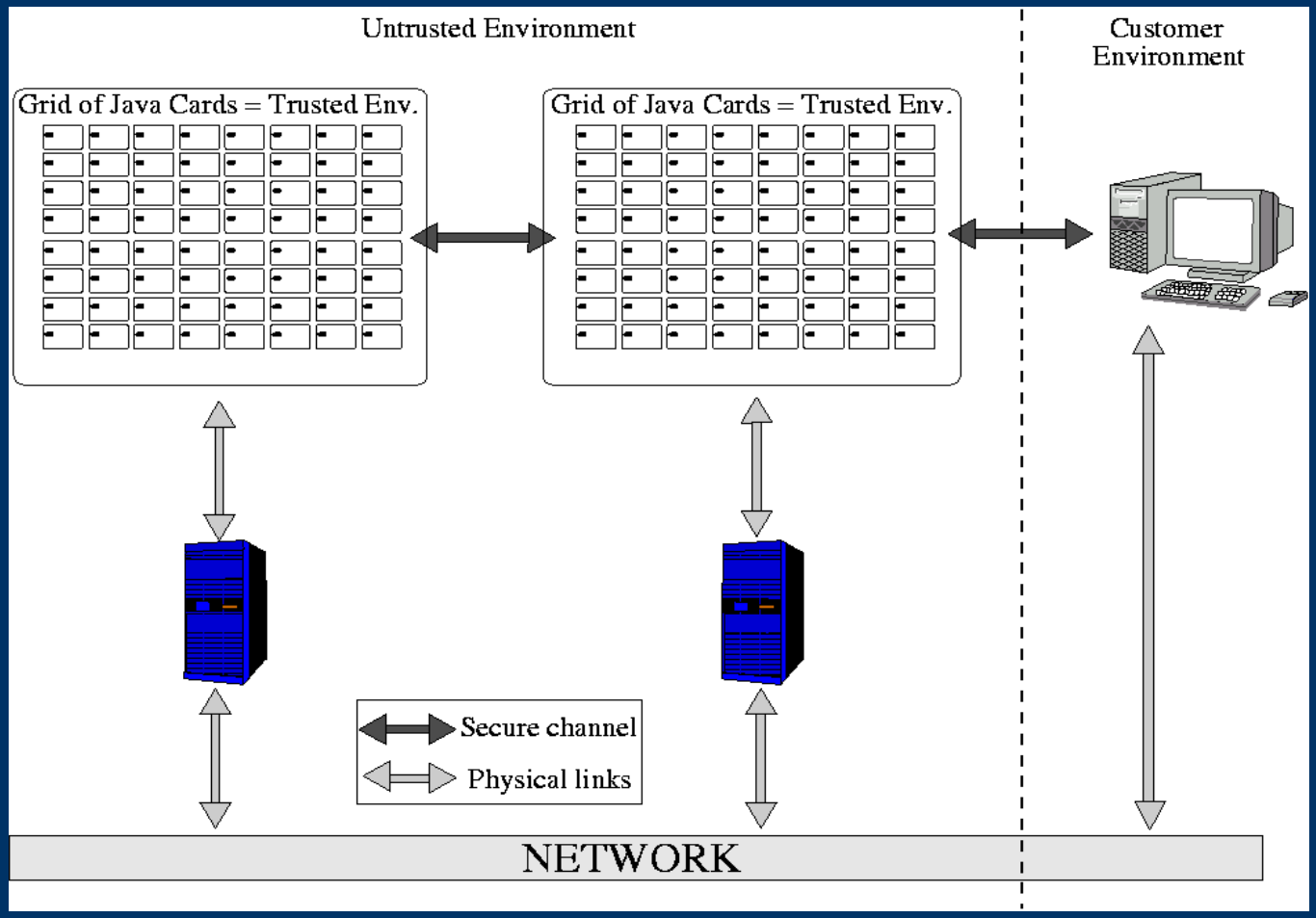
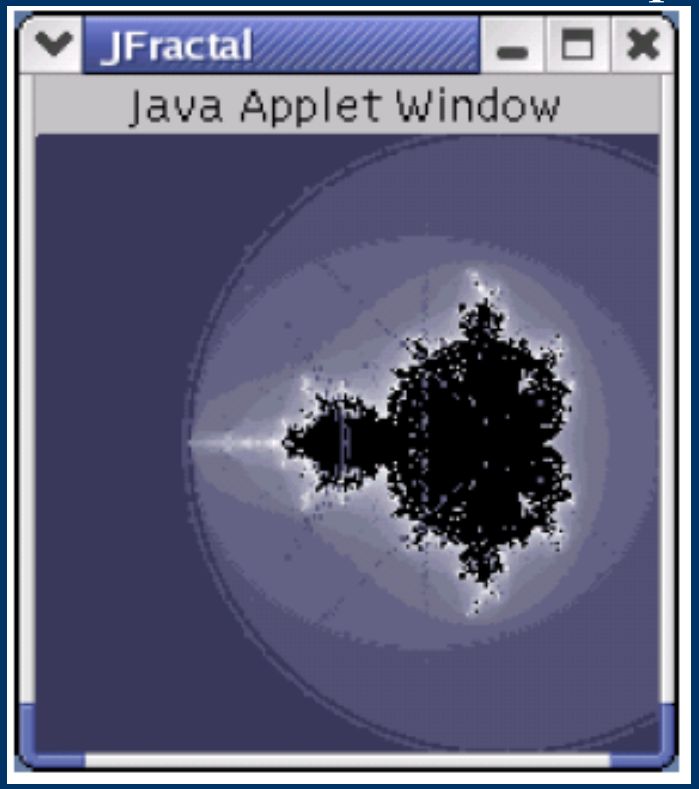
THE ORIGINAL JAVA CARD GRID (LaBRI)

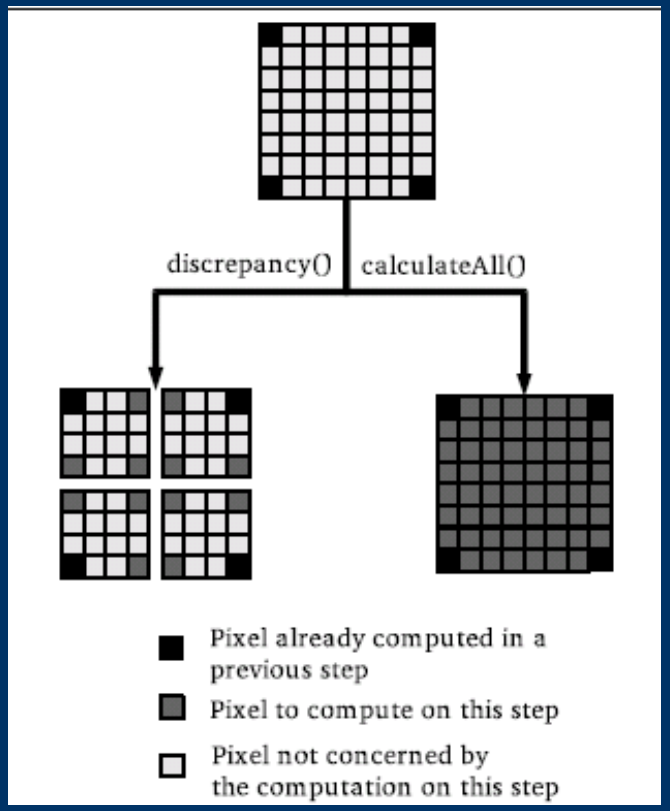


- GOAL: build a cluster of smart cards and to provide a software framework for developing and managing secure applications on it.
- e-Smart 2005 Isabelle Attali Award for the best innovative technology (France)
- Invited paper at the 2006 HPC&S Conference (Germany)

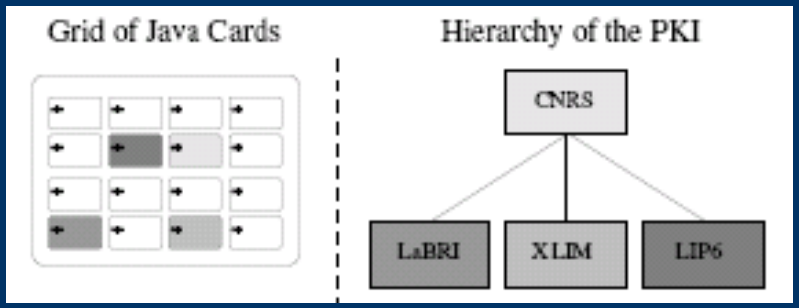
APPLICATIONS

- Secure distributed computing



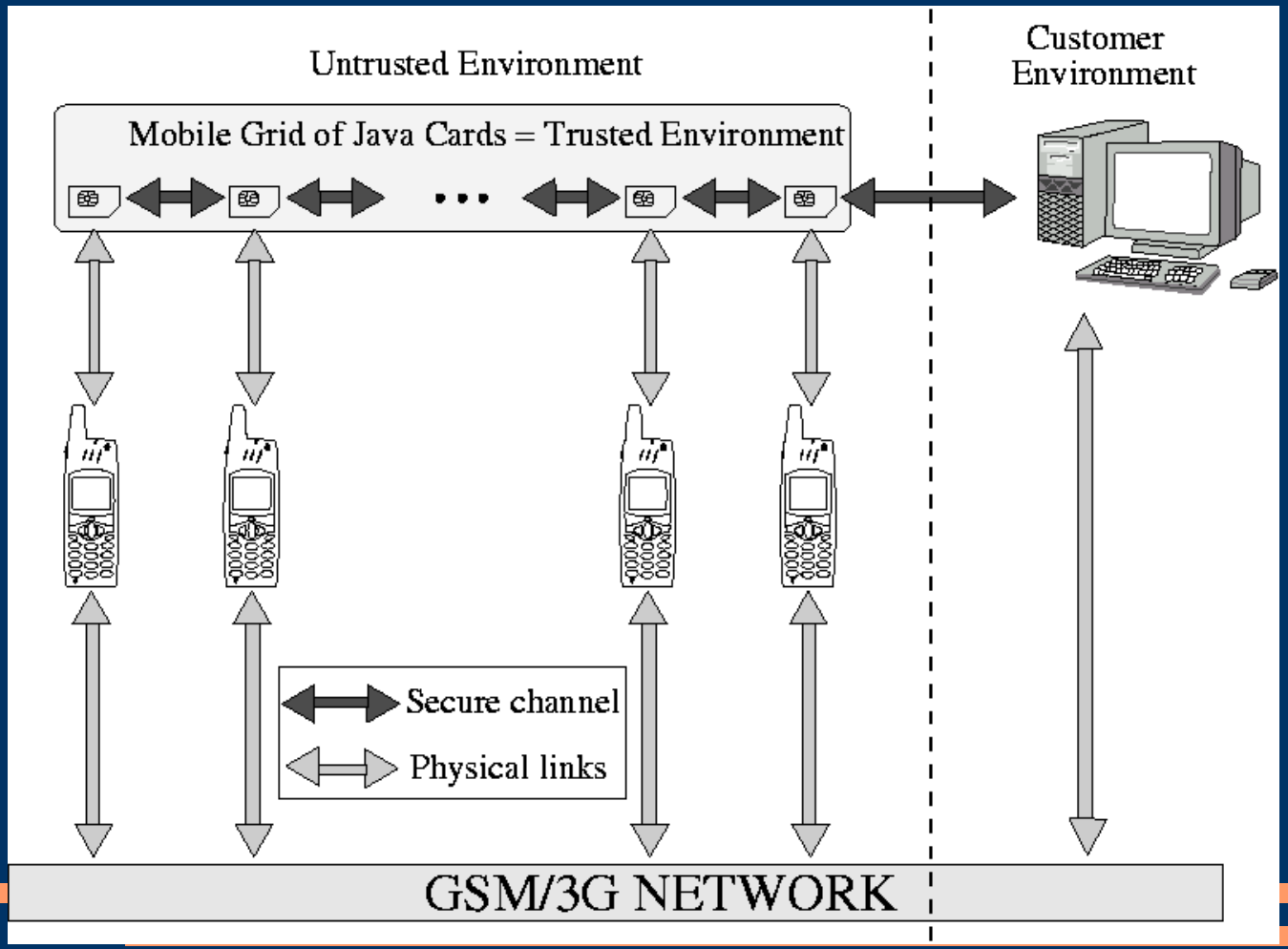


- Secure distributed datamining
- Secure distributed storage:
  - a PKI application

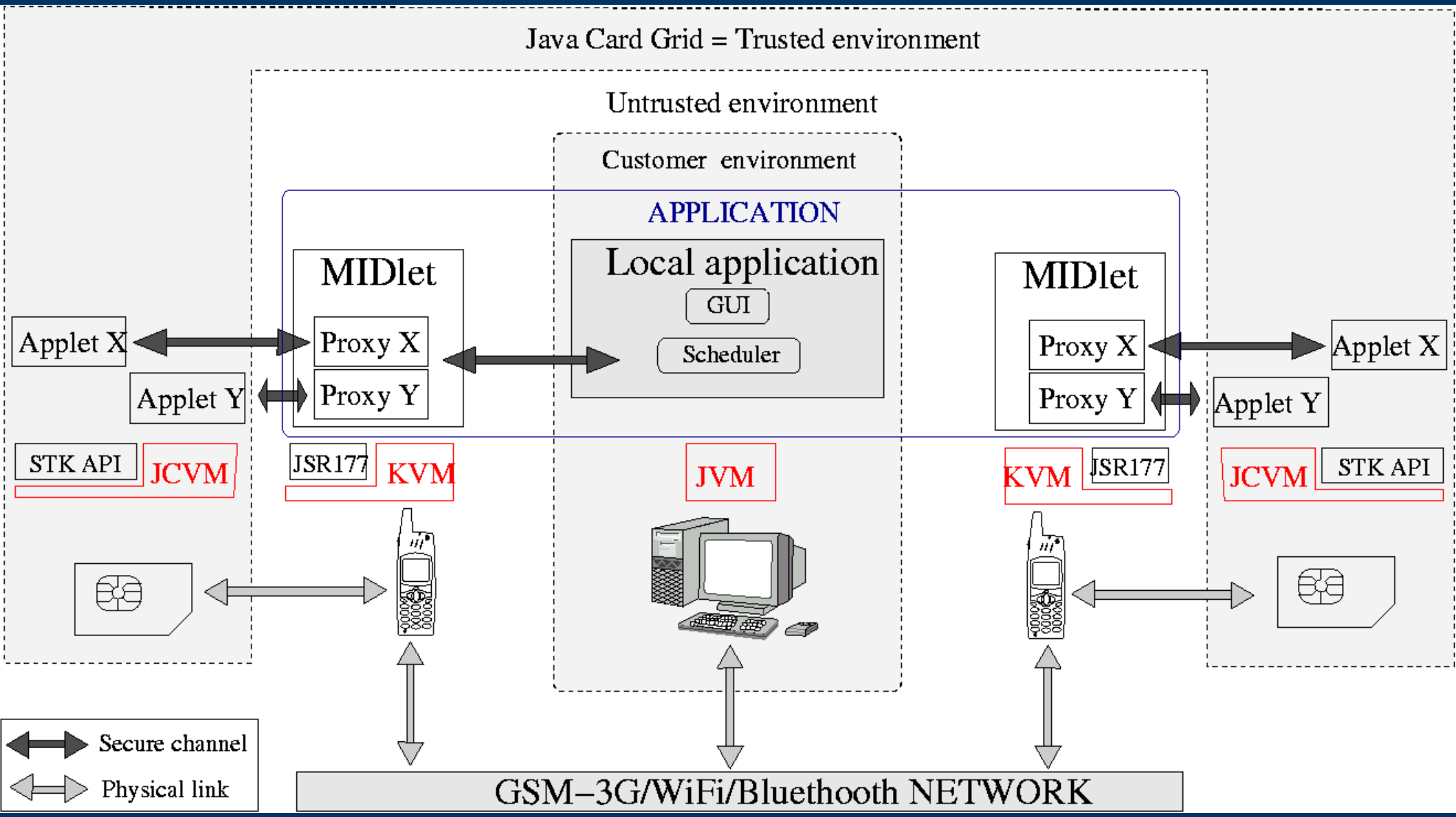


THE MOBILE JAVA CARD GRID

- GOAL: explore new application domains, by extending to a mobile context based on mobile phones the possibilities offered by the original Java Card Grid



FRAMEWORK OVERVIEW



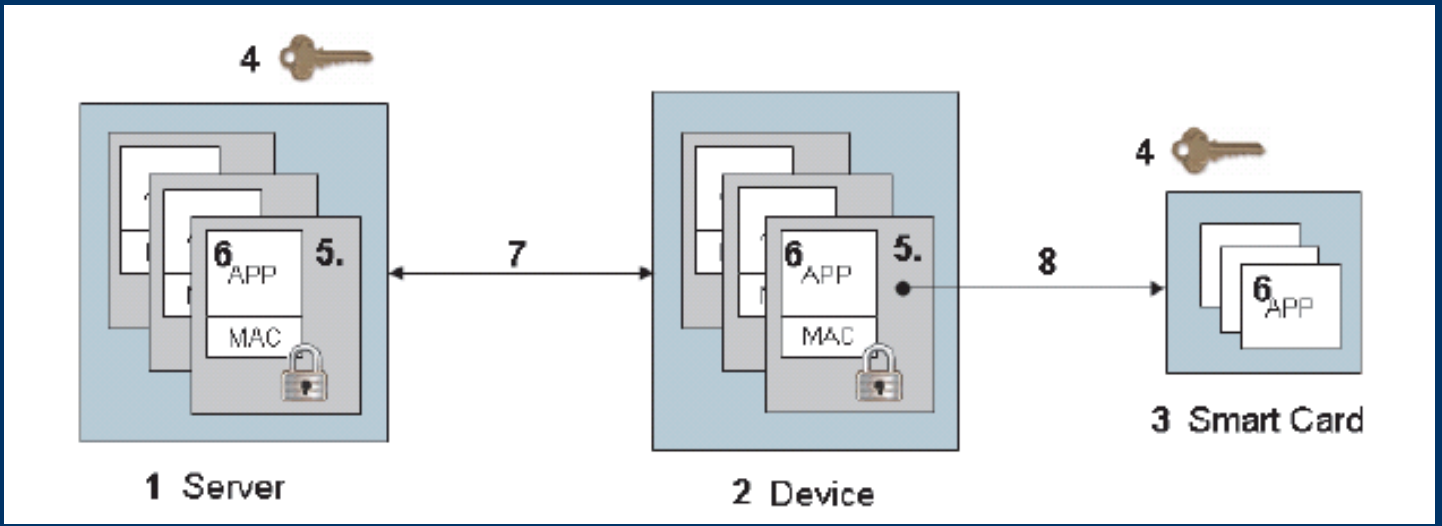
Assume that Java is used everywhere: JVM, KVM, JCVM

CHALLENGES

- Applications deployment
- Pro-activity
- Communication
- Memory constraints

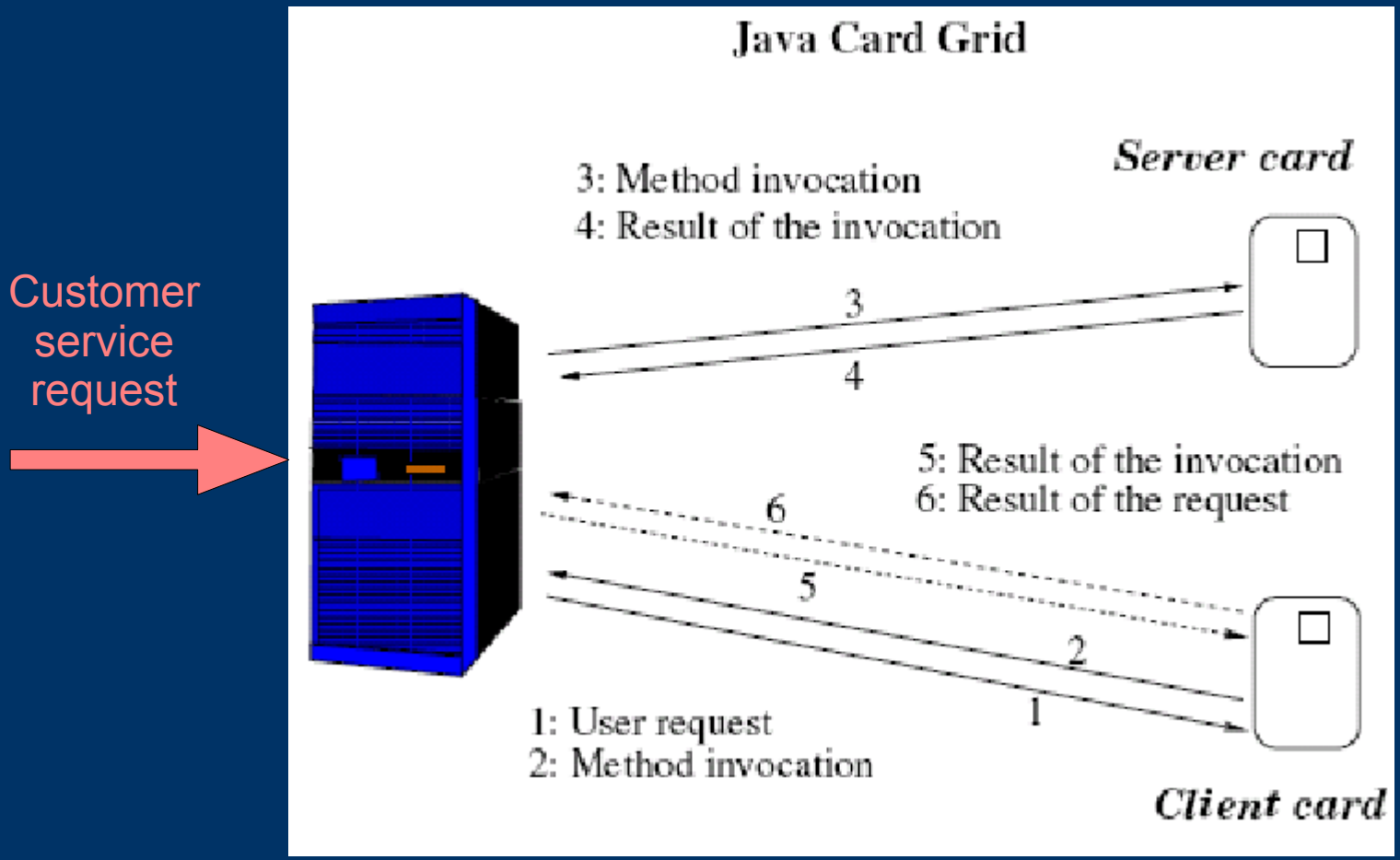
APPLICATIONS DEPLOYMENT

- Problem with OTA deployment: limited bandwidth
- Solved using the solutions developed by the RHUL ISG-SCC:
  - Uses high bandwidth channels (GSM, ...) and security agents (MIDlet + ciphered card applet) for the deployment
  - GlobalPlatform compliant solution



PRO-ACTIVITY

- Enables the card to act as a client
  - In the original Java Card Grid



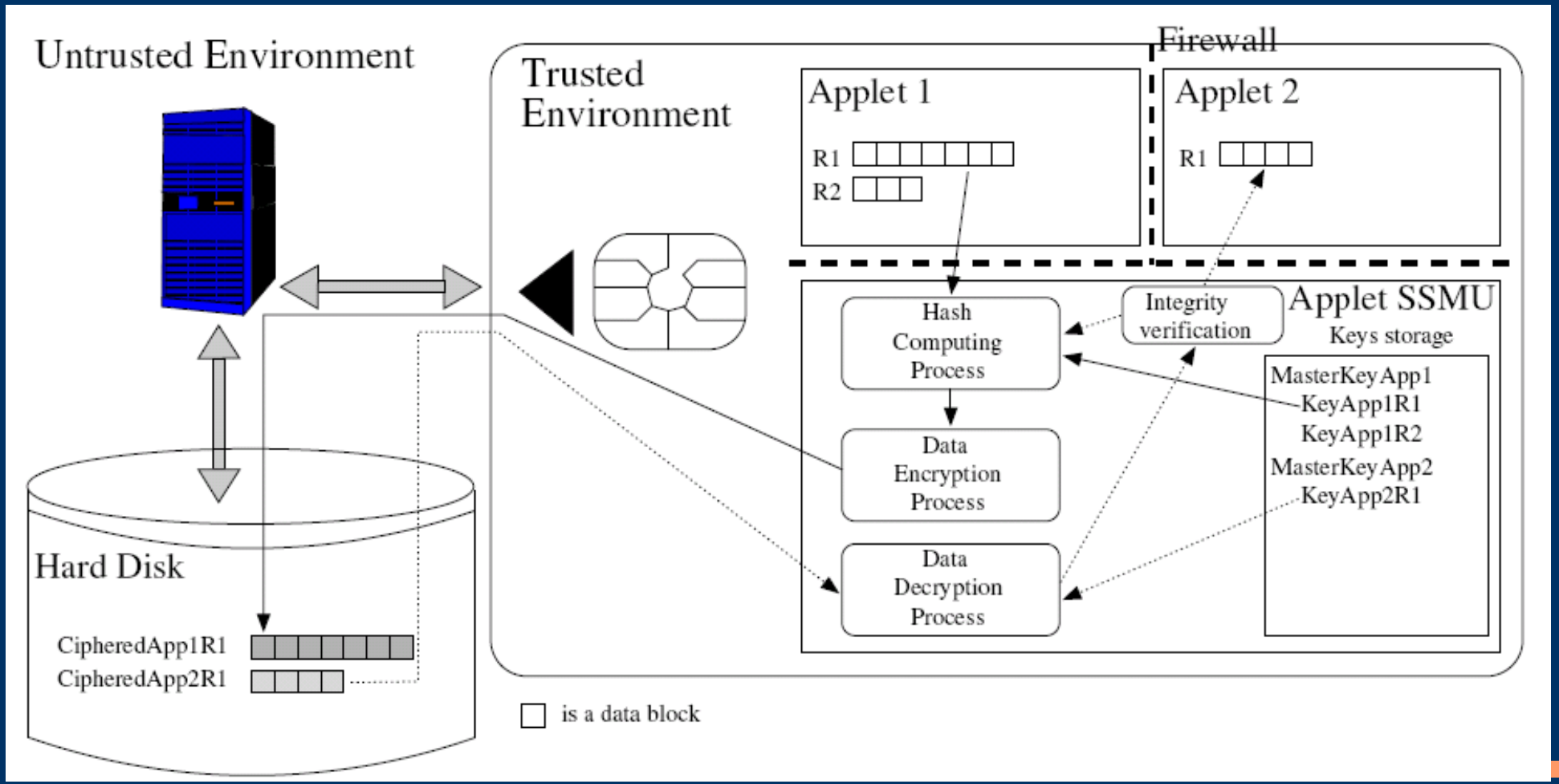
  - Already built in (U)SIM cards

COMMUNICATION

- Between the mobile and the smart card
  - JSR177
- Between the mobiles
  - through Bluetooth: JSR-82
  - through WiFi
  - GSM/UMTS
- Between the smart cards (in client/server mode)
  - STK (SIM ToolKit) API

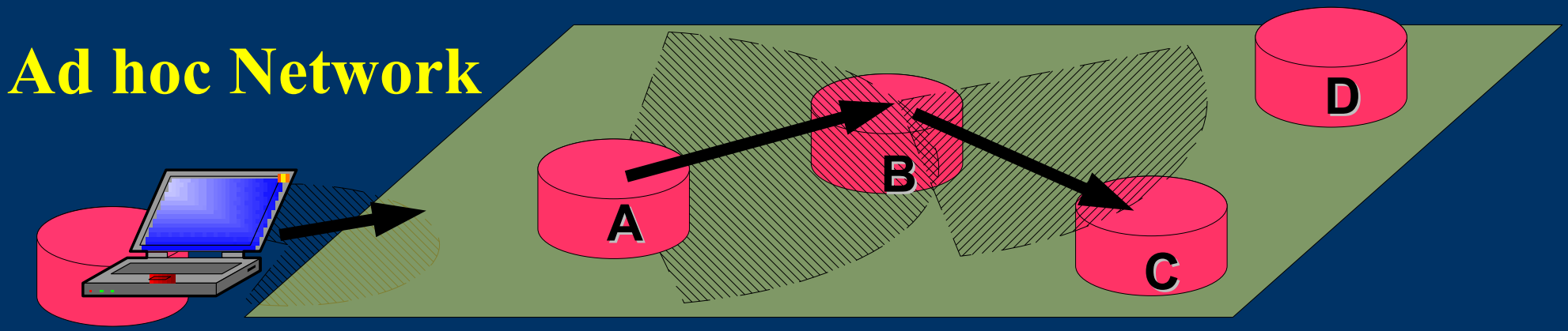
MEMORY CONSTRAINTS

- 2 solutions:
  - Waiting the next generation cards (1Gb)
  - Using secure extended memory developed at LaBRI



FUTURE APPLICATIONS

- Credential sharing between a group of users
- Distributed datamining
  - In phonebook of the employees
  - ...
- Set up a multilevel ad hoc network in a peer to peer mode or emulate its behaviour



CFP: Who has a killer application?

CONCLUSIONS & PERSPECTIVES

- To gather all the developed solutions to build a prototype
- To imagine a killer application
- Will be a joint project between:
  - The ISG-SCC
  - The LaBRI
  - The XLIM

THANKS

- Giesecke & Devrient GmbH
- Vodafone
- Sun Microsystems
- IBM
- Oberthur
- Gemplus
- Axalto
- Smartmount
- SCM microsystems
- Fujitsu

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(7) Will Sirret, PhD thesis