

The Potential of SIM Cards as an Application Platform for Smart Server Systems

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- Research Topics
 - Software: Contactless Applications and Infrastructure
 - Hardware: Testing & Interoperability
 - Security
 - Usability
- Founded by Industry Partners
 - Mobilkom Austria (Vodafone Partner)
 - NXP Semiconductors
 - Omnikey/Assa Abloy (HID Global)
- NFC Forum Member



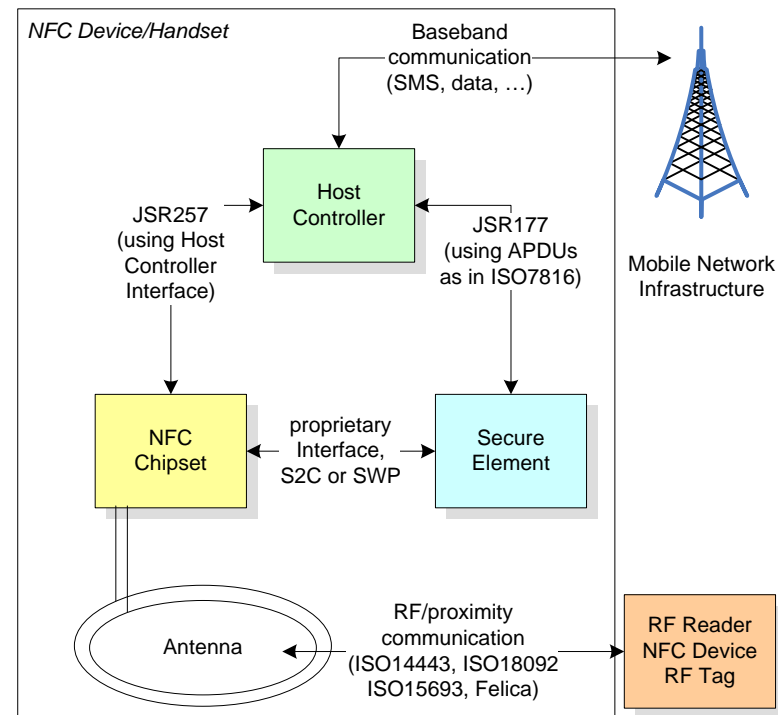
Potential of SIM/UICC

- SIM/UICC considered as Secure Element for NFC
- UICC as a multi application platform (JavaCard based)
- Applications
 - GSM/UMTS Application
 - the Wireless Identity Module (WIM), based on PKI
 - VAS applications through the SAT technology
 - Contactless Applications
- Space
 - 128 K – 256 K
 - Applet: Mastercard's PayPass ~ 20 K



SIM Approach in NFC

- SIM Application Tool Kit (SAT)
- SIM Card uses Data Services of Handset (BIP)
- SIM Card acts a contactless reader
 - NFC HCI defines pipes between secure elements
 - Management of other secure elements by TSM



SIM Application Toolkit (SAT)

- “Everything” running on the SIM
 - Application
 - GUI
 - OTA Connection
- Evaluation
 - + does not depend on handset/OS
 - - limited GUI/interaction
 - - only for SIM Card



SAT Development today:

- Dev-Tools needed (HW & SW)
- “open”, but provisioned SIM Card
- Development about 3 – 5 x (comp. to J2ME)
- Small Community, few documents, few tutorials
- Example: Socket Connection
 - J2ME: 50 Lines of Code; 100+ Examples on the Web; 1 h Work
 - SIM: 400 lines of Code; 1 Example; 1 Week Work

Bringing two Worlds together

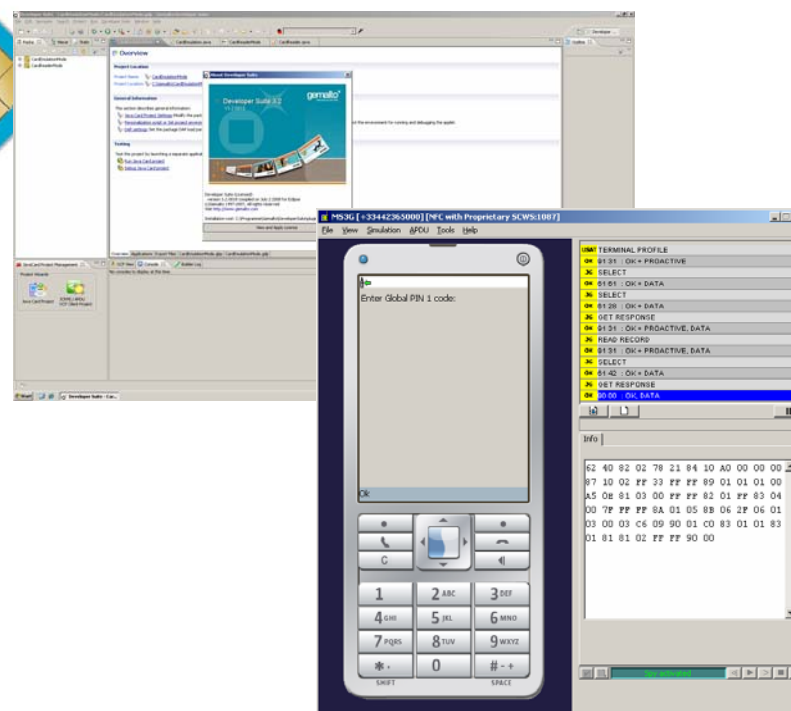
- SmartCard Webserver
 - Smartcard Engineers develop Servlets?
 - Web developers go contactless?

- Imagine ...
 - Click on a Web link causes to phone to read a Tag
 - Local “MasterCard Servlets” for mobile Payment
 - Your Handset is your *FaceBook*
 - Web sites make use of “localhost” Content (Web 2.0)
 - IP over NFC for external RF communication
 - SOAP based Services on SIM

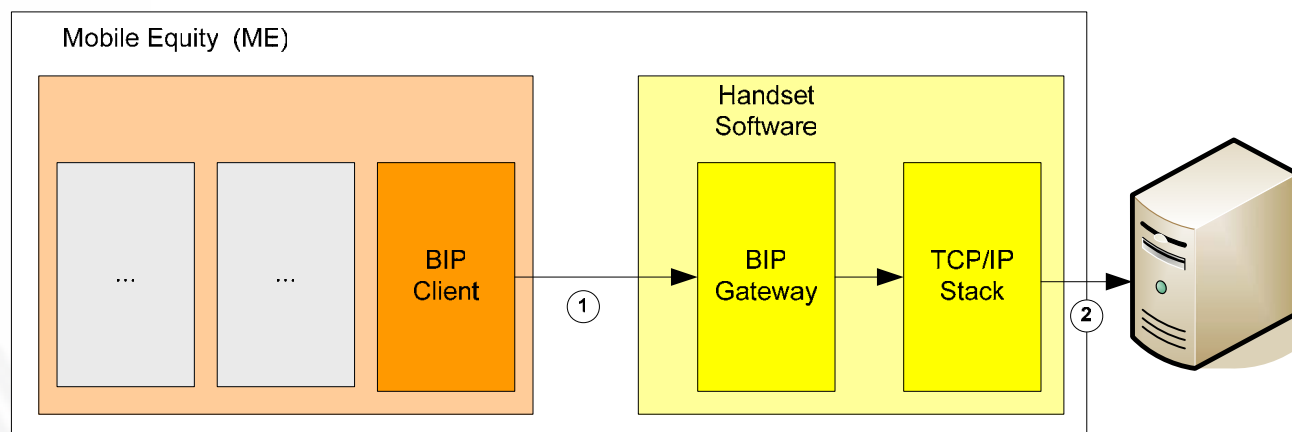


Building a light weight SIMServer

- Recipe
 - OMA SCWS Standard (Final Release April '08)
- Ingredients
 - BIP SIM-Card
 - SAT Developer Tool
 - Emulator/Handset
- Preparation
 - Stir well and invest some time

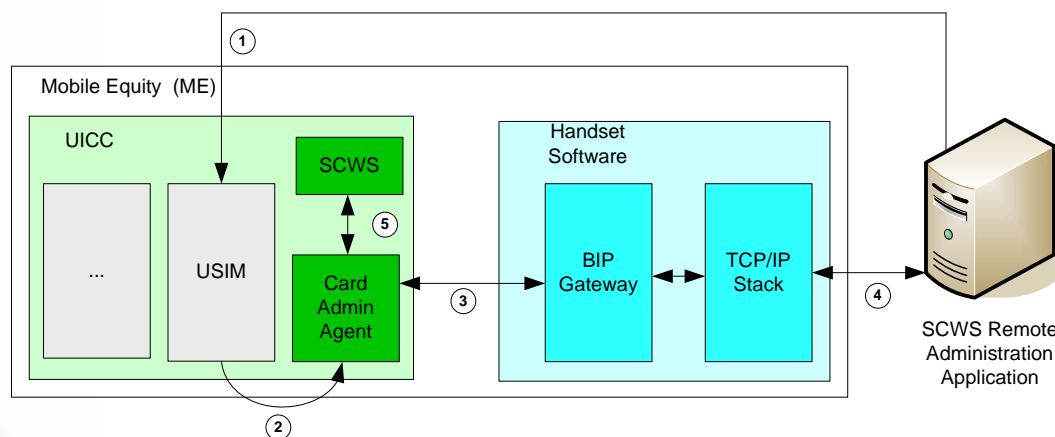


Basic Functionality: BIP Client Mode



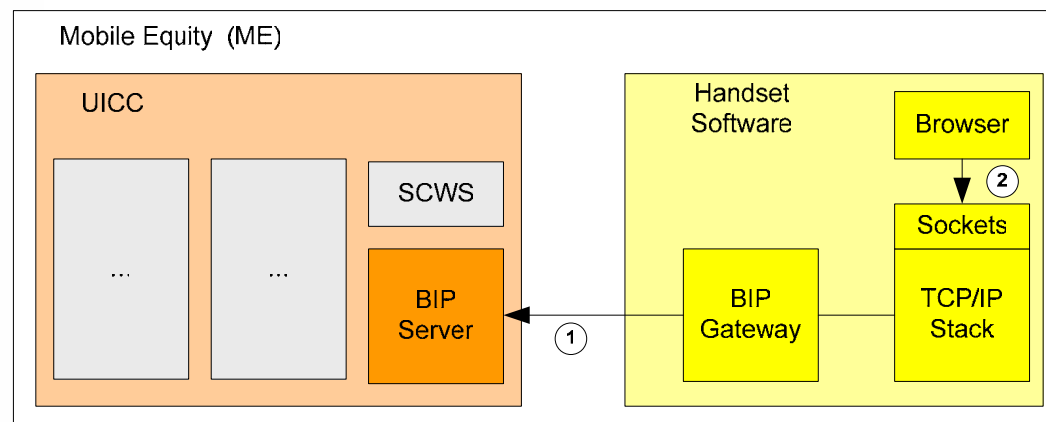
- UICC sends BIP comments to BIP Gateway (1)
 - „Establish an IP Connection to ...“
- BIP Gateway (2)
 - TCP/IP Channel is setup (GPRS/EDGE/UMTS)

SCWS Functionality: SCWS Remote Management



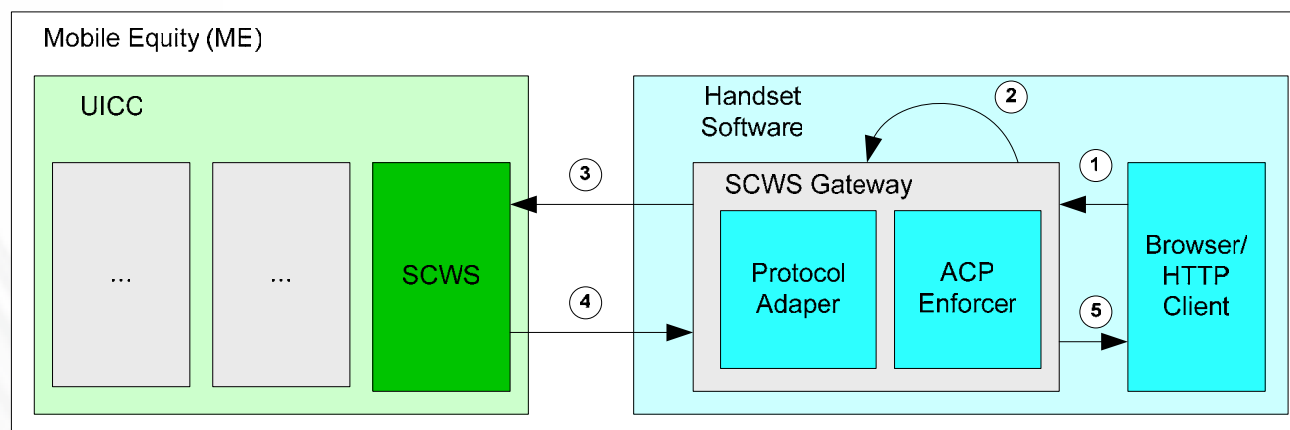
- Short message is sent to handset (1)
- Card Admin agent is triggered (2) and advises BIP Gateway to establish a connection (3)
- Remote Server receives client request (4) and is able to send data to the SCWS
- Other triggers (@ 1): Time, User Interaction (Open App, Touch Tag/NFC ...)

Basic Functionality: BIP Server Mode



- BIP Gateway sends Request for Connection (1)
 - TCP/IP Stack can offer a Server Socket
- Browser is able to contact “localhost” (2)
 - Send HTTP/HTTPS Request to UICC

SCWS Functionality: Local Access



- TCP/IP Stacks offers Socket Server Port; Browser sends request (1)
- Access Control Policy: Is application allowed to do so? (2)
- Request is forward to SCWS (3), reponse generated and sent back to Browser (4) & (5)

Implementation of light weight SIMServer: Status

- Supports
 - SCWS Administration Mode
 - SCWS Local Browsing Mode
 - HTTP 1.0
 - Emulator only so far/Single Threaded
 - JavaCard 2.1

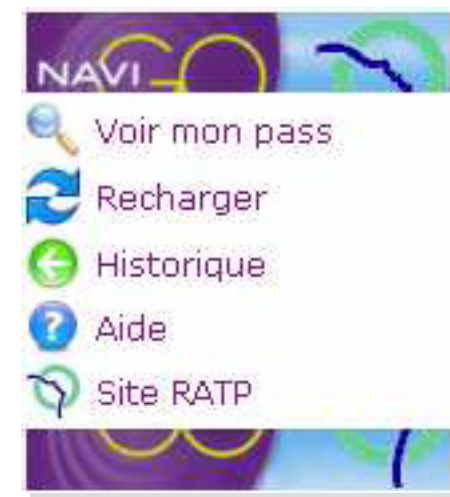
- No (yet) considered
 - ACP Enforcer
 - HTTP 1.1
 - Test on handset/real SIM

OMA SmartCard Web Server: Status Today

- Your “mobile” localhost
- Look depends on Browser
 - x different Display sizes
 - y different mobile Browsers
- Multi Threaded Operating System on SIM
- Standards
 - OMA Standard (for JC 2.1)
 - Part of Java Card 3.0

Smart Card Web Server: Pros & Cons

- Access through
 - NFC/RF
 - OTA
 - Application on handset (Browser)
- Evaluation
 - + nice web interface to Applications on the SIM (also phonebook, ...)
 - -/+ SIM bigger and more expensive
 - - Browser/special Handset needed
 - - User Experience: GUI/UE not satisfying



SmartCard Web Server (SCWS): Usecases

- MNO/Handset Manufacturer: Branding of Browser
- On-Card Portal as „Home“ in Browser
- Local/Remote File Administration on SIM
- Hot-Deployment of Application OTA of
 - CardLets
 - Contactless Applications
- Images, CSS and Templates on SIM (Space!)

Conclusion

- SIM become a complex and flexible application platform
- SCWS on JC 2.1
 - Not multi threaded
 - High development effort
- JC 3.0: MIDP/CLDC Functionality in a SIM
- Space on SIM costly (Graphics, Animations)
- Deployment requires TSM or MNO



LG L600 V, Nokia 6131 SWP, Motorola SLVR L7



Sagem my700X



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Happy to answer any questions

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