

# Advancing Student Identity: Think outside the card



## NFC Technology Turns Smartphones Into Secure Credentials



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# Open NFC Versus Secure NFC

- **Open NFC is primarily used for transactions that do not require a high level of security**
  - Does not require the use of a secure element to store identity
  - Drawbacks when used for mobile access extend beyond the lack of security
- **Secure NFC is primarily used for transactions that do require a high level of security**
  - Requires the use of a secure element to store identity
  - Provides a high degree of security, privacy and user convenience

**Use of Open NFC or Secure NFC for mobile access control should be based on risk appropriate authentication!**

# NFC Card Emulation

- Idea:
  - The phone emulates a card, the host does not need to know about it;
  - it can be provisioned remotely;
  - the card becomes virtual
- Which SE technology: SE on SIM, eSE,  $\mu$ SD?
- How to get the virtual card there?
- How many virtual cards can be there simultaneously?
- Can we switch between them?
- How do we provision it from the phone?

# The Mobile Access Model



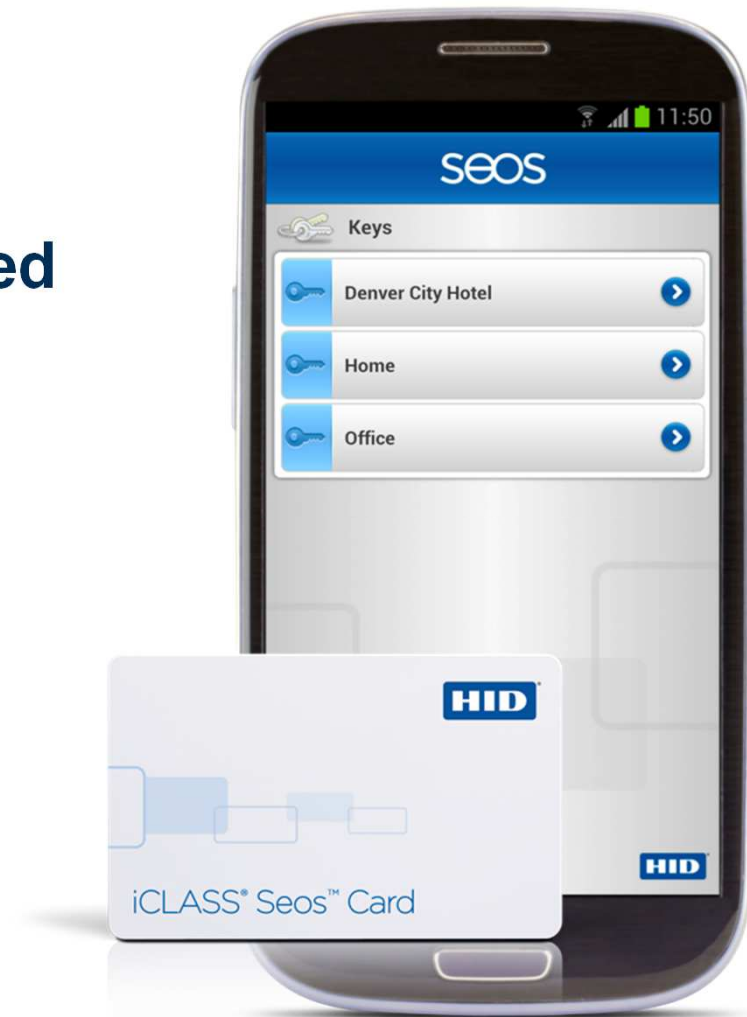
Keys and access cards  
in your daily life

Converged in your  
NFC-enabled smartphone

Used to open different  
types of doors and  
Windows®

# What's Important to Users

- Users want convenience
- System administrators seek flexibility
- Multiple digital keys are required simultaneously
  - And allow me to choose the correct key quickly
- Digital keys must be secure and private
- The solution must be available on multiple types of handsets and in a card form factor



# The Technology Vision

- **A single applet instance must:**
  - Support many independent applications (digital keys) simultaneously
  - Offer an “always on” mode such that no end-user intervention is necessary
  - Offer multiple configurations for user selection
  - Be scalable and support fast selection
- **There must be a rich user interface (app)**
  - Offer the ability to see and manage all digital keys from the user interface
- **The technology itself must be:**
  - Easily portable to any standard Java-card based secure element or UICC
  - Based on open architecture based on open standards
  - Highly secure with a high level of privacy

# What is Seos?

- **Seos™ is the world's first commercial ecosystem for issuing, delivering and revoking digital keys on mobile phones with NFC technology**
- **Seos is:**
  - **A legacy free card command set**
  - **Designed for access control**
  - **With a specific focus on security, privacy and an enhanced user experience**
  - **When implemented on a mobile smartphone**



# A Quick Technical Comparison



| <b>Feature</b>                              | <b>MIFARE</b> | <b>DESFire</b> | <b>iCLASS</b> | <b>Seos</b> |
|---|---------------|----------------|---------------|-------------|
| <b>Full privacy support</b>                 |               | √              |               | √           |
| <b>NSA Suite B Cryptography</b>             |               | √              |               | √           |
| <b>Uses only NIST approved security</b>     |               |                |               | √           |
| <b>Full ISO/IEC 14443-4 support</b>         |               |                |               | √           |
| <b>Full emulation on standard Java Card</b> |               |                |               | √           |
| <b>Multiple active cards seamlessly</b>     |               | √              |               | √           |
| <b>Decentralized and scalable</b>           |               |                |               | √           |
| <b>Mobile extensions</b>                    |               |                |               | √           |



# The “Nuts And Bolts” Required To Facilitate Mobile Access

NFC-enabled handsets



NFC-enabled readers, electromechanical locks and a wide ecosystem of third-party hardware



Ecosystem of mobile network operators (MNOs), Trusted Service Managers (TSMs) and others to deliver and manage mobile credentials



# Ways to Enable Handsets

- **SIM Centric**
  - Need to integrate with the Mobile Network Operators (MNOs)
  
- **Embedded Secure Element (eSE)**
  - No need to integrate with the MNOs
  - Must integrate with the handset manufacturers
  
- **Alternative Form Factors:**
  - NFC microSD cards or add-ons such sleeves/cases
  - No need to integrate with the MNOs or the handset manufacturers



SIM-NFC connection through a single, wired interface



# NFC-Enabled Reader Hardware

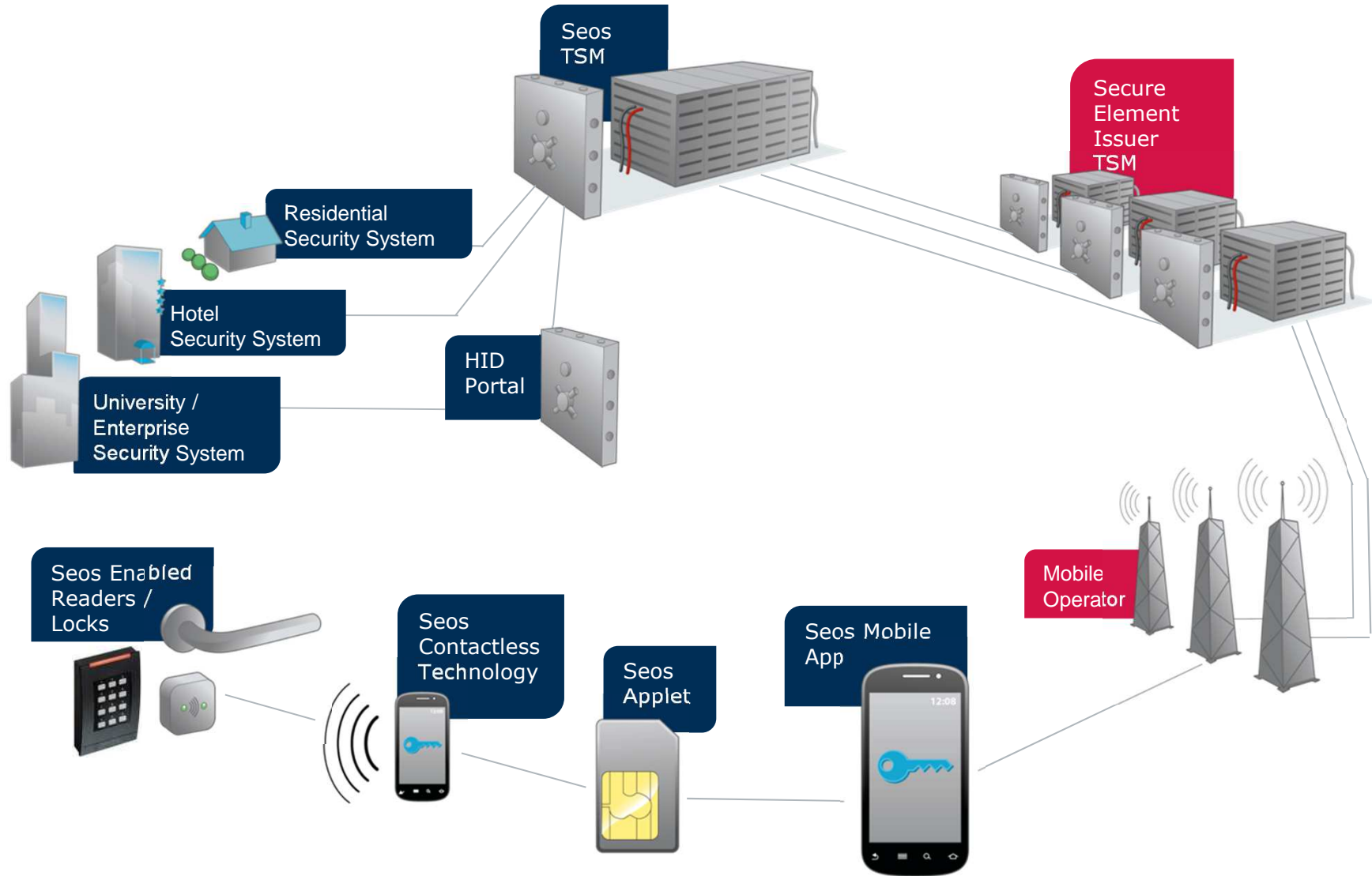


Seos-enabled NFC smartphones require complementary hardware:

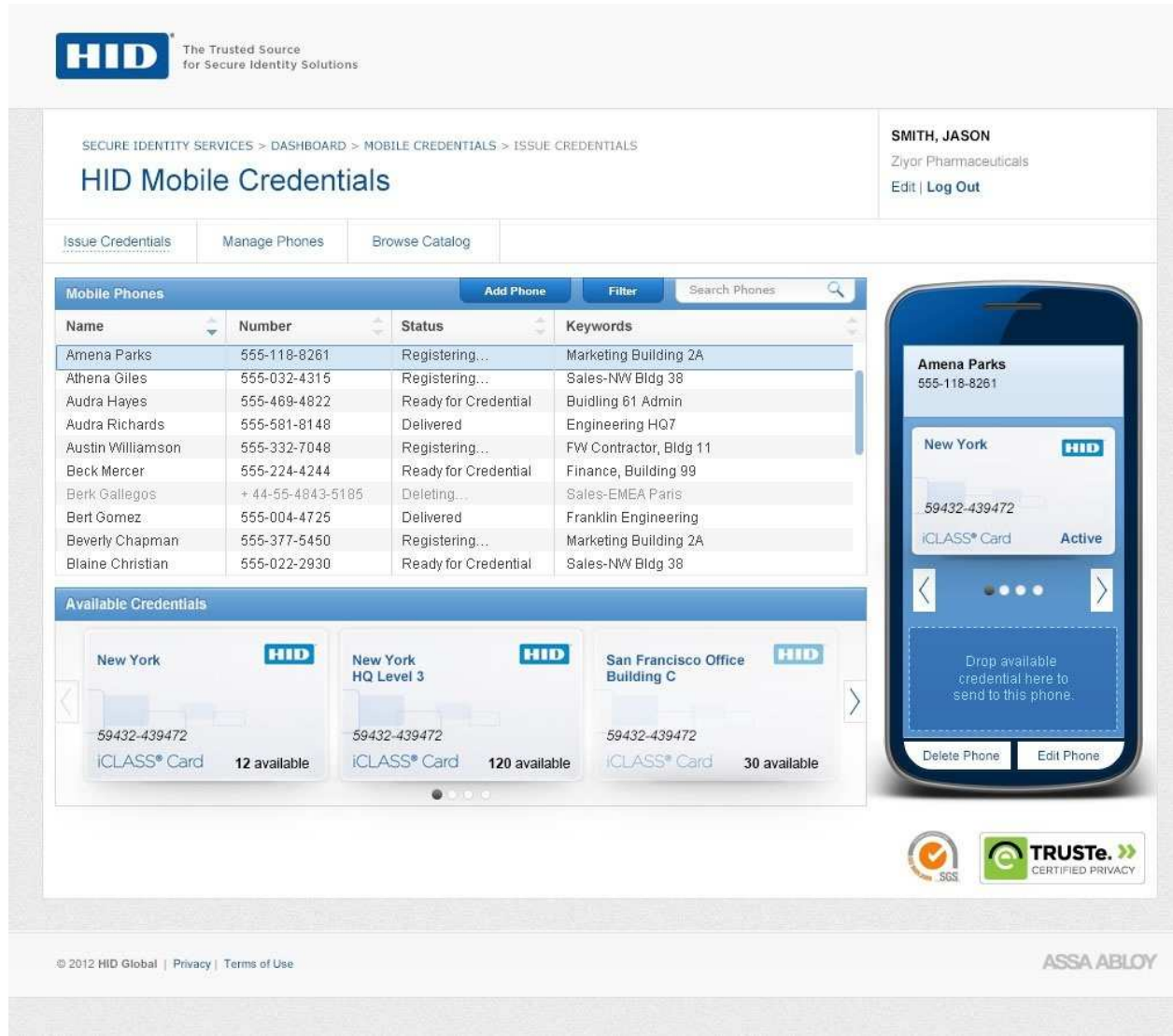
- On-line HID iCLASS SE® readers
- Electromechanical locks
- Residential Locks
- Desktop readers
- Third-party hardware for a variety of applications:
  - Time and attendance
  - Secure print authentication
  - Biometric template storage



# Seos: Powering Mobile Access



# HID Secure Identity Services™ Portal



**HID** The Trusted Source for Secure Identity Solutions

SECURE IDENTITY SERVICES > DASHBOARD > MOBILE CREDENTIALS > ISSUE CREDENTIALS

**HID Mobile Credentials**

SMITH, JASON  
Ziyor Pharmaceuticals  
Edit | Log Out

Issue Credentials | Manage Phones | Browse Catalog

| Name              | Number            | Status               | Keywords               |
|-------------------|-------------------|----------------------|------------------------|
| Amena Parks       | 555-118-8261      | Registering...       | Marketing Building 2A  |
| Athena Giles      | 555-032-4315      | Registering...       | Sales-NW Bldg 38       |
| Audra Hayes       | 555-469-4822      | Ready for Credential | Building 61 Admin      |
| Audra Richards    | 555-581-8148      | Delivered            | Engineering HQ7        |
| Austin Williamson | 555-332-7048      | Registering...       | FW Contractor, Bldg 11 |
| Beck Mercer       | 555-224-4244      | Ready for Credential | Finance, Building 99   |
| Berk Gallegos     | + 44-55-4843-5185 | Deleting...          | Sales-EMEA Paris       |
| Bert Gomez        | 555-004-4725      | Delivered            | Franklin Engineering   |
| Beverly Chapman   | 555-377-5450      | Registering...       | Marketing Building 2A  |
| Blaine Christian  | 555-022-2930      | Ready for Credential | Sales-NW Bldg 38       |

**Available Credentials**

- New York** (59432-439472): 12 available
- New York HQ Level 3** (59432-439472): 120 available
- San Francisco Office Building C** (59432-439472): 30 available

**Smartphone Mockup:** Amena Parks 555-118-8261. New York (HID) 59432-439472. ICLASS® Card Active. Drop available credential here to send to this phone. Buttons: Delete Phone, Edit Phone.

SGS TRUSTe CERTIFIED PRIVACY

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# Delivering Seos Digital Keys



Seos applet installed, ready to receive credentials

# Handset Update

- RIM / BlackBerry® Devices
- Android™ Devices
- Microsoft / Windows® 8 Devices
- Apple® iOS Devices
  - iPhone 5 does not have NFC



# Seos Provides...

- **Convenience to users**
- **Flexibility for system administrators**
- **Simultaneous use of multiple digital keys**
  - The reader can choose the key for the user
- **Secure and private digital keys**
- **Functionality on multiple handsets, SIMs and embedded secure elements, and cards**





# What Should I Do Now?

- **Prepare for the future use of mobile access by installing and using iCLASS SE readers**
  - These readers support a wide range of technologies including HID and Indala proximity, iCLASS, MIFARE and Seos for mobile access
  - These readers will also support Seos cards and mixed environments
- **Become educated about the “nuts and bolts” of mobile access**
  - Understand the various mobile access offerings and how to differentiate between them
- **Ask your mobile network operator to support Seos in NFC-enabled smartphones**
  - Mobile network operators need to know that the market is ready to embrace the use of NFC for mobile access control

## Videos

- Arizona State University:  
<http://www.youtube.com/watch?v=d4NmYdMAAHU>
- Netflix:  
<http://www.youtube.com/watch?v=KLEoF8wwAKA>
- Good Technologies:  
<http://www.youtube.com/watch?v=AHVk1UJqkGE>
- Seos:  
<http://www.youtube.com/watch?v=hM5enp7vvcM>

# For More Information...



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