

Migration Strategies

(With an Emphasis On Moving from 125 kHz Prox to 13.56 MHz Contactless Smart Card Technology)

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Agenda

- **Introduction & Caveats**
- **Definitions**
 - Prox, Contactless Smart Cards, Multi-technology Cards
- **Why migrate to Contactless Smart Cards?**
 - Comparisons, Features, Multi-application capabilities, ISO, etc.
- **Migration Strategies**
 - ◆ Multi-technology cards
 - ◆ Use existing cards and add contactless smart card sticker
 - ◆ Use multi-technology readers
- **Optimum Migration Strategy**
- **Migration choice comparisons**
- **Moving data from legacy applications**
- **Integrated card issuing**
- **Wedge Readers**
- **Summary**
- **Questions & Answers**

Introduction & Caveats

- **This presentation discusses migration strategies, not new project implementations**
- **Of course the best solution is to rip out the old legacy systems and start from scratch but**
 - **Cost impact is major factor**
 - **Re-badging thousands of employees may be an obstacle**
 - **What to do during interim period?**
- **Some of the solutions presented here may be the long-term solution or used as a stepping-stone for migration to a single contactless smart card solution**

What is Prox?

- **“Prox” is a term used predominately in the United States to describe an RFID technology used in the Access Control Market**
 - Requires no physical contact between a card and reader
 - Operates at 125 kHz
 - Typical operating distance from 4 to 6”
 - Packaged in cards or key fobs
 - Read-only
 - Data content typically from 26 to 40 bits
 - Generally very low security of data
 - No ISO standards exist
 - More than 250 million Prox cards have been sold

What is Contactless Smart Card Technology?

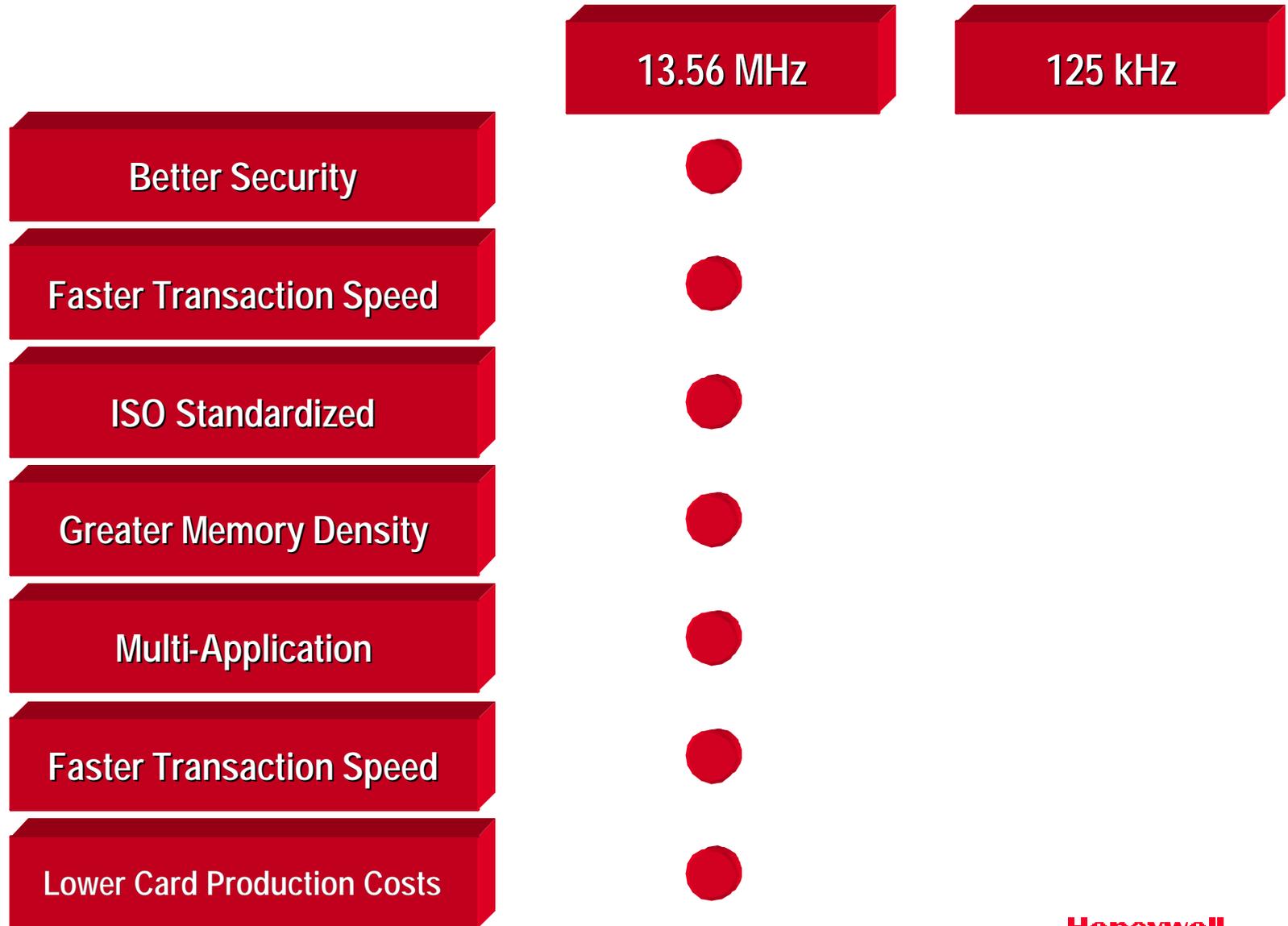
- **Contactless Smart Cards**
 - Requires no physical contact between a card and reader
 - Operates at 13.56 MHz
 - Typical operating distance from 2” to 6”
 - Maximum operating distance of 39”
 - Packaged in cards, key fobs, stickers, labels, and more
 - Data content from 256 bits to 4k bytes and more
 - Memory can be segmented for *multi-application* use
 - Very high security
 - Supports true read/write on the fly
 - ISO Standardized (ISO 14443A/B & 15693)

What is a Multi-Technology Card?

- Card that contains more than one machine readable ID technology
- Choices include:
 - Contact Smart Card
 - 13.56 MHz Contactless Smart Card
 - ◆ PicoPass™, Mifare™, iClass™, MyD™, etc.
 - 125 kHz Prox
 - ◆ HID, Indala, AWID, EM, etc.
 - Magnetic Stripe
 - Debit Stripe
 - Bar Code
 - Optical Stripe
 - Barium Ferrite (Magnetic Technology)
 - Etc.



Why Migrate to Contactless Smart Cards?



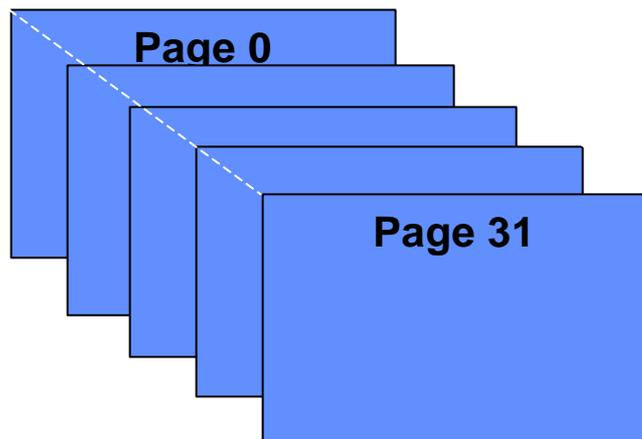
Why Migrate? (cont.)

- **Added Benefits With No Increase in Price**
- **Increased Security**
- **Ability to use same card for additional applications:**
 - **Biometrics: Carry multiple templates on card**
 - **Logical Access**
 - **ID: Carry Tamperproof Digital Photographs**
 - **Portable Database: Encrypted Information for authentication or emergencies**
- **Interoperability**
- **Future Growth**

Why Migrate? (cont.)

- **Multi-Application Support**

- 64 bit serial number
- 32 applications each with individual secret keys
- Each application “slot” has up to 232 usable bytes
- Can combine multiple apps to increase memory



Multi Application example
using PicoPass 32KS

Application	Data Blocks
0	Access Control
1 - 4	Logical Access
5	Time & Attendance
6	Vending
7 - 14	Finger Print (2 fingers)
15 - 16	IRIS Scan
17 - 27	Digitally Signed Photograph
28 - 30	Environmental & Building Mgmt
31	Burglar Alarm Arm/Disarm

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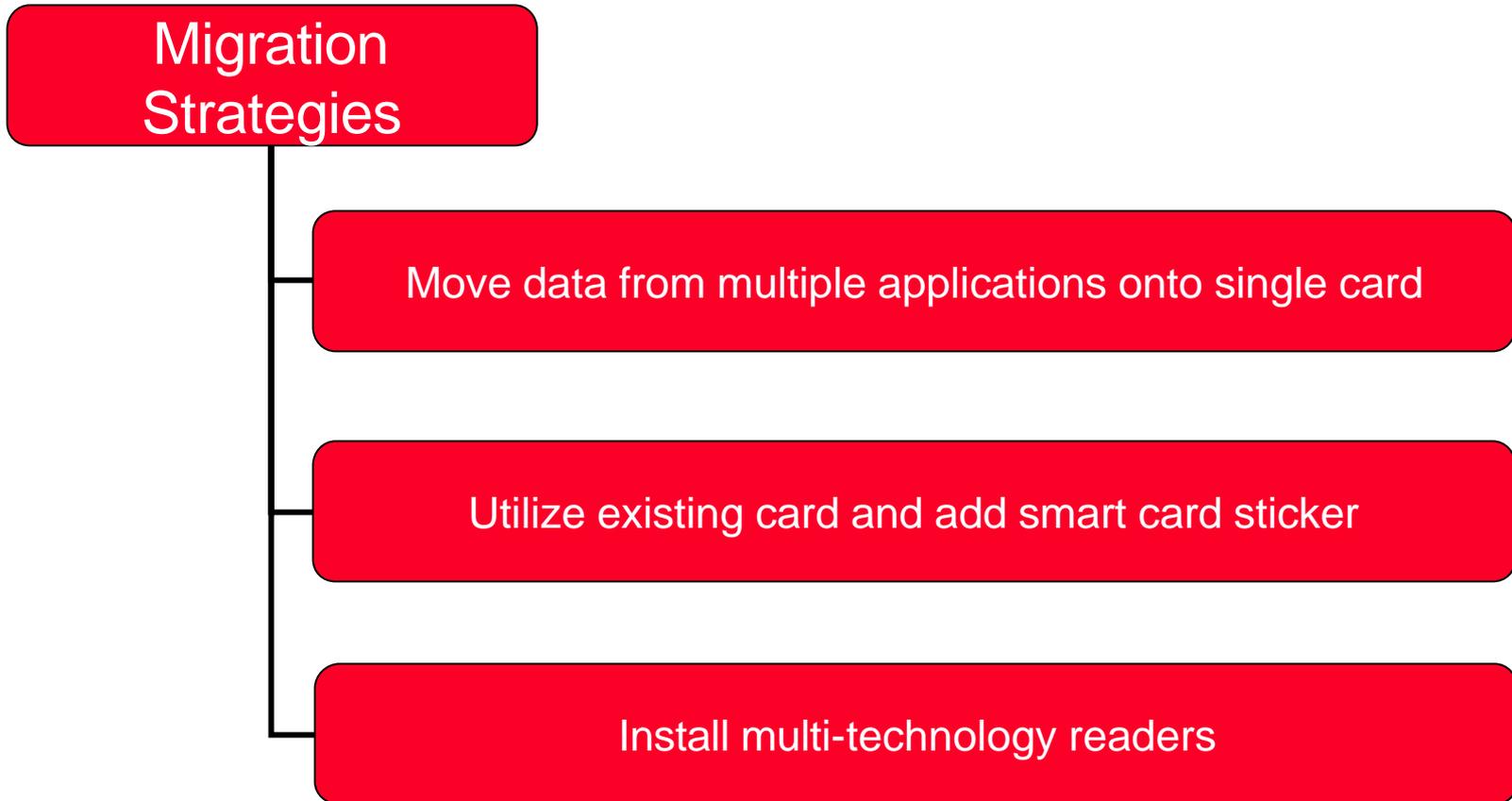
Why Migrate (cont.)

- **Multi-Application Support**
 - Smart cards allow multiple applications - each protected with its own keys
 - Vendor should disclose keys for unused applications, i.e., open key strategy
 - Open Key Strategy advantages:
 - ◆ Other application slots free for use
 - ◆ Increases value of access control card
 - ◆ Allows one card to be used for many applications at the same time
 - ◆ Eliminates obsolescence
 - ◆ You're in control, switch access control vendors without reissuing cards

Why Migrate (cont.)

- **International Standardization**
 - **Current 125 KHz Prox Technology**
 - ◆ No ISO existing or planned standardization
 - ◆ Proprietary
 - HID, Motorola, AWID, Casi-Rusco, etc.
 - **New 13.56 MHz Contactless Smart Cards**
 - ◆ Standards DO exist
 - ISO 14443A, 14443B, 15693
 - ◆ Open standards with interoperability encourages broad supplier support and customer acceptance
 - ◆ Open standards can increase market size driving prices down
 - ◆ Facilitates interoperability between vendors and applications
 - ◆ Helps to drive costs down
 - ◆ Helps to eliminate obsolescence

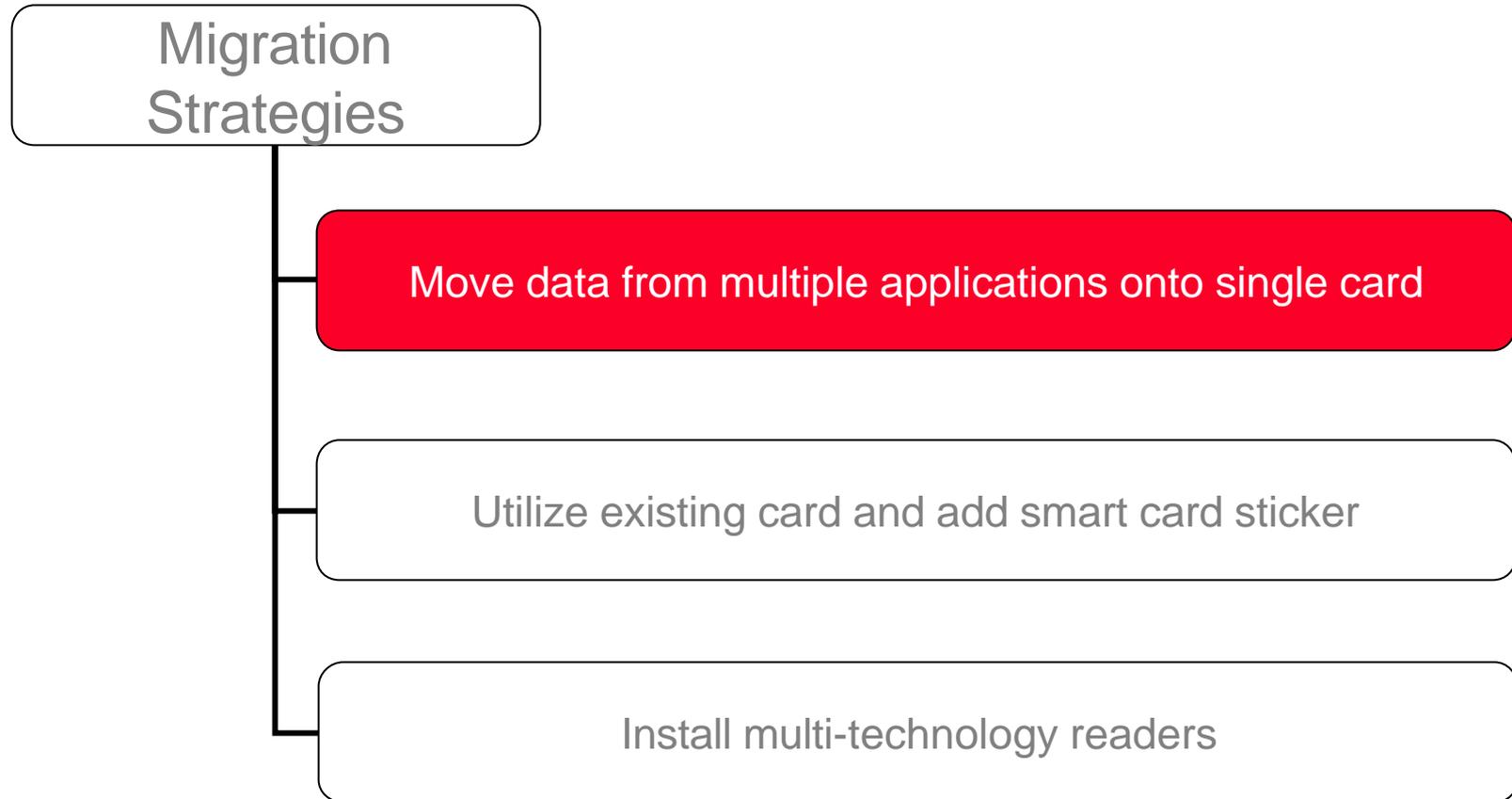
Migration Strategies



Migration Strategies (cont.)

- **The following slides illustrates the three major migration strategies**
 - **Note that hybrid solutions combining elements from the different migration strategies are possible**

Migration Strategies



Migration Strategies: Use a Multi-Technology Card

- **Method is to utilize the existing technologies for existing applications and put them on a single card**
- **Each legacy application utilizes the same technology that was used before**

Migration Strategies: Use a Multi-Technology Card

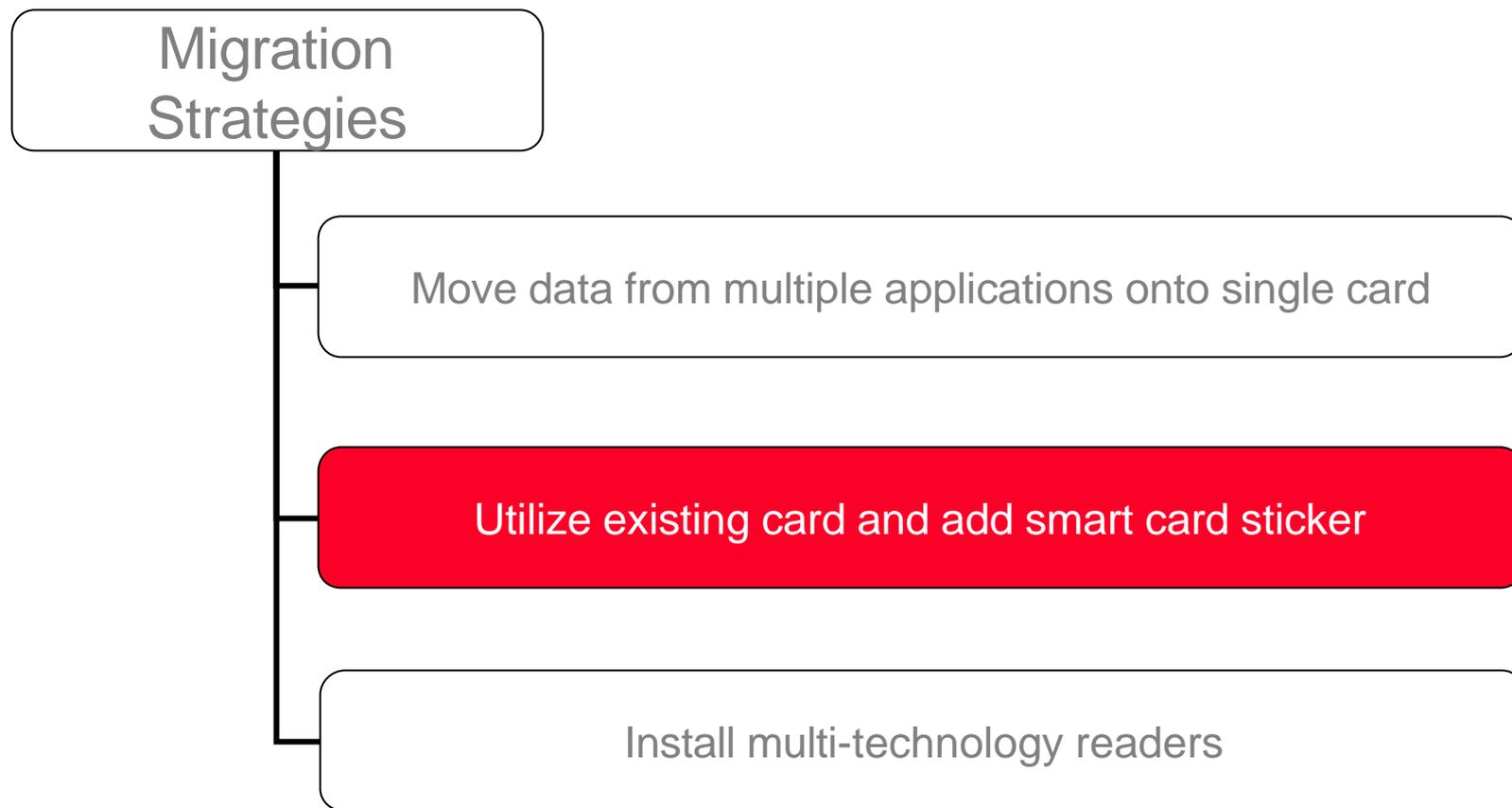
- **Advantages**

- Most aesthetic looking card
- Most secure card

- **Disadvantages**

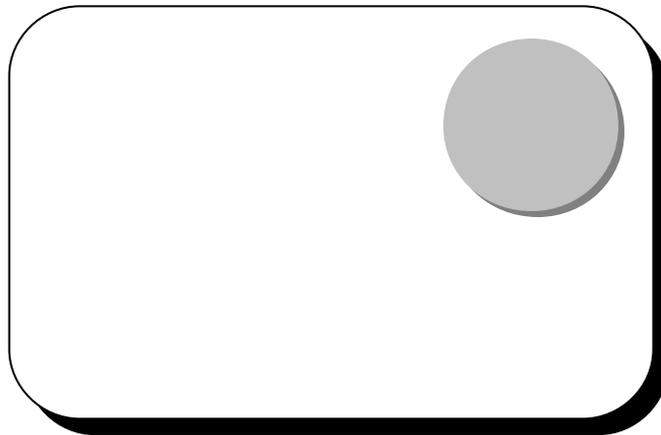
- Most expensive card
 - ◆ Each technology contributes to manufacturing and cosmetic fallout
- Reduced field-reliability due to multiple technologies
 - ◆ Some combination of technologies weaken card structure
 - ◆ Additional cost to re-badge due to failure

Migration: Use existing card w/smart sticker



Migration: Use existing card w/smart card sticker

- **Several companies make a smart card “Sticker”**
- **Sticker contains antenna and chip just like a card**
- **Sticker utilizes a permanent adhesive for easy affixing to existing card**



Migration: Use existing card w/smart card sticker

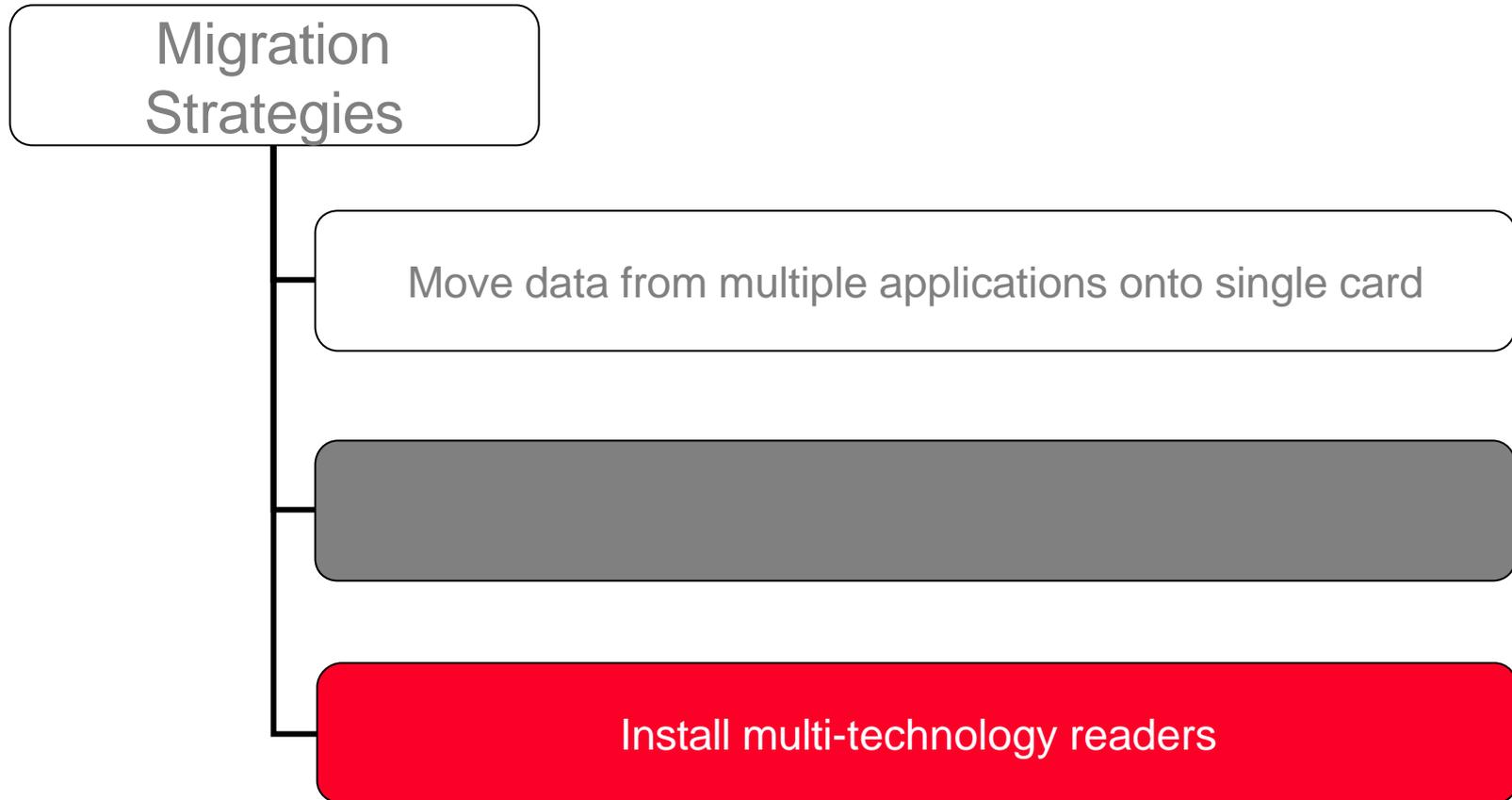
- **Advantages**

- Much lower cost because existing card is not thrown out
- No migration of existing information from legacy applications

- **Disadvantages**

- Not as aesthetic as a single card
- Slightly reduced range due to smaller antenna
- Location of patch important so card still works in existing readers (like magstripe)
- Some organizations (Gov't, etc.) do not allow anything to be affixed to a card
- Possible security issue if sticker is removed from card
 - ◆ Patch is designed to self destruct when removed
 - ◆ Electronic anti-tamper mechanisms available

Migration Strategies



Migration Strategies: Use Multi-Technology Readers

- **Multi-technology readers are capable of reading two different technologies**
 - Prox and Contactless Smart Card
 - Contact and Contactless Smart Card
 - Prox and Magnetic Stripe
- **Multi-technology readers may have multiple output protocols and interfaces**
 - Wiegand
 - Clock & Data
 - RS232
 - Etc.

Migration Strategies: Use Multi-Technology Readers

- **Advantages**
 - No changes to cards
 - No card re-badging
- **Disadvantages**
 - Typically most expensive migration strategy
 - ◆ Cost of readers are higher
 - ◆ Readers available from only a few vendors
 - ◆ Not all technology choices available
 - Reader obsolescence occurs faster

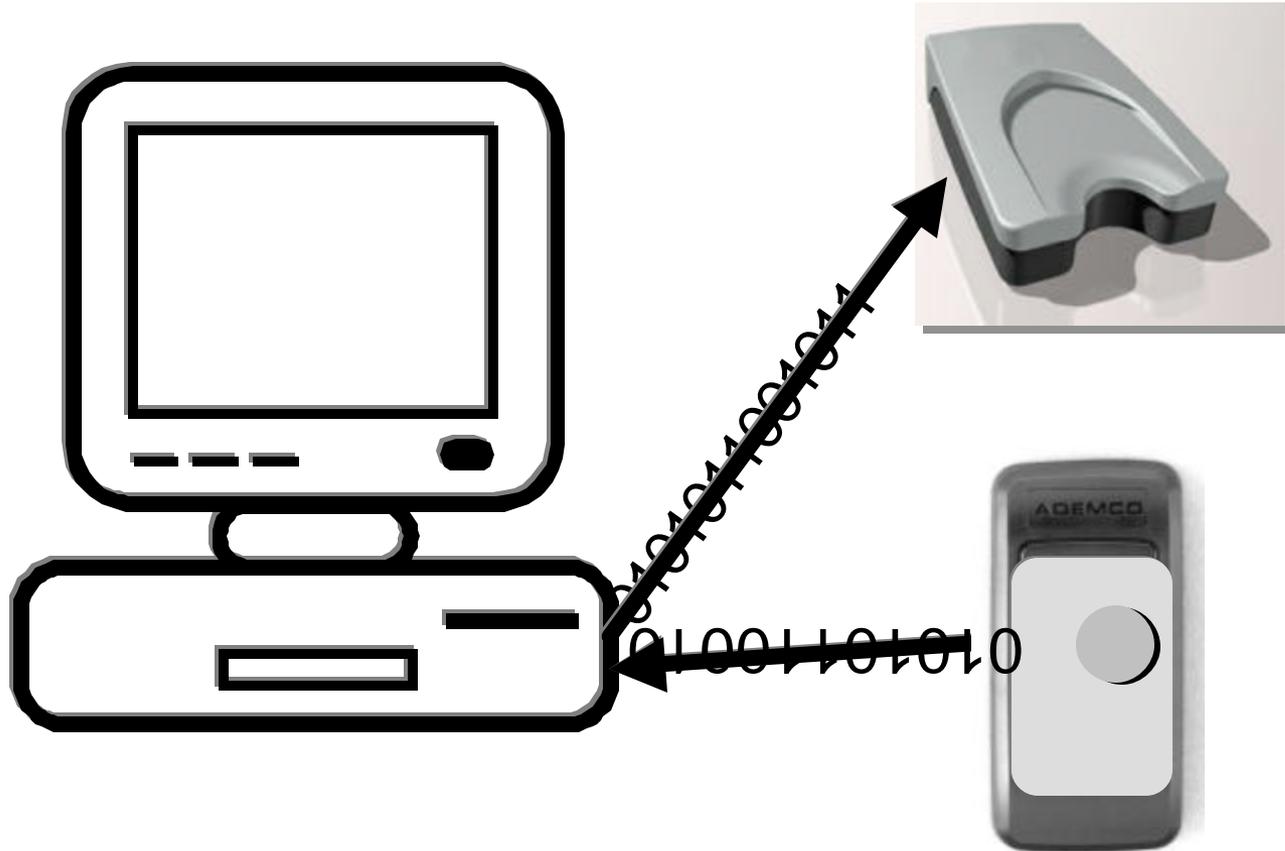
Optimum Migration Strategy

- **Optimum strategy is to migrate all legacy applications to just contactless smart card solution utilizing separate application areas**
 - Single technology card is most cost effective and reliable
- **Biggest stumbling block is**
 - Retrieving data from legacy application and moving it to contactless smart card
 - Emulating legacy protocol and physical interface
- **Can use all of the previous migration methods discussed for interim**

Moving Data From Legacy Applications

- **Best method is to electronically move data under computer control**
 - No human typing errors
 - Can automate process
 - Very convenient, complete process can take less than 30 seconds
- **Can almost always retrieve legacy data using its legacy reader interfaced to a PC**
 - Security and internal formats need not be known since legacy reader already knows how to read card
 - Even if reader is proprietary, output data can usually still be captured at a PC
 - Ideal method to move legacy applications where vendor has gone out of business or is uncooperative

Moving Data From Legacy Applications (cont.)



Step 4: Affix sticker to existing 125 kHz Prox card

Integrated Card Issuing

- **If legacy data is already stored in a database:**
 - **Can use a Dye-Sub Printer w/Smart Card Encoding to automate process**
 - ◆ **Unattended batch processing possible**
 - ◆ **Issue and personalize cards on demand**



“Wedge” Readers

- **Many times a keyboard “wedge” reader can be used with a contactless smart card reader instead of original legacy reader**
 - Advantage is original PC application does not have to be changed at all!
- **If legacy application already uses a wedge reader then it is a no-brainer to retrieve legacy data into a PC and rewrite into a contactless smart card**

Questions and Answers

