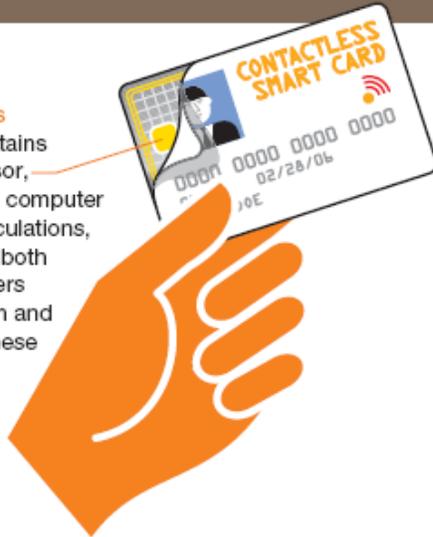


The difference between contactless smart cards & RFID tags

Overview: what happens in RF (radio frequency) communication

- 1 When a contactless smart card or an RFID tag passes within range, a reader sends out radio frequency electromagnetic waves.
- 2 The antenna, tuned to receive these waves, wakes up the chip in the smart card or tag.
- 3 A wireless communications channel is set up between the reader and the smart card or tag.

The **contactless smart card** contains a microprocessor, a small but real computer that makes calculations, communicates both ways, remembers new information and actively uses these capabilities for security and many other applications.



RFID tags are devices that typically have a read-only chip that stores a unique number but has no processing capability. It is more like a radio-based bar code used mostly for identification (hence "radio frequency identification").



Characteristics of a contactless card

- **Strong security capacities:**
 - mutual authentication before providing access to information
 - access can be further protected via PIN or biometric
 - encryption to protect data on card during exchange
 - hardware and software protection to combat attacks or counterfeiting
- Hundreds of security features mean an individual's personal ID, financial details, payment transactions, transit fares or physical access privileges can be safely stored, managed and exchanged
- Read and write memory capacity of 512 bytes and up, with very large memory storage possible
- Short distance data exchange, typically two inches

Characteristics of an RFID tag

- **Minimal**
 - one-way authentication; card cannot protect itself
 - insufficient storage for biometrics
 - no on-chip calculations of new information
 - relies on static keys
- Single function; used to help machines identify objects to increase efficiency. Example: inventory control
- Small memory (92 bytes); often read-only
- Larger distance data exchange, typically several yards

Because of their more restricted capabilities, RFID tags are generally cheaper.

Source: Gemalto