

The background is a collage of various currency notes, including US dollars and Euros, with large, semi-transparent numbers (1, 2, 3, 4, 5, 6, 7, 8) overlaid. A central dark blue rectangle with a white border contains the text 'Card personalization'. Above this rectangle, the text 'ICMI LEARNING' is displayed in white on a dark blue background, with a small orange and yellow line graph icon integrated between the words. Orange arrows point from the numbers 1, 2, 3, 4, 5, 6, and 7 towards the central text box.

# ICMI LEARNING

**Card personalization**

# Card personalization



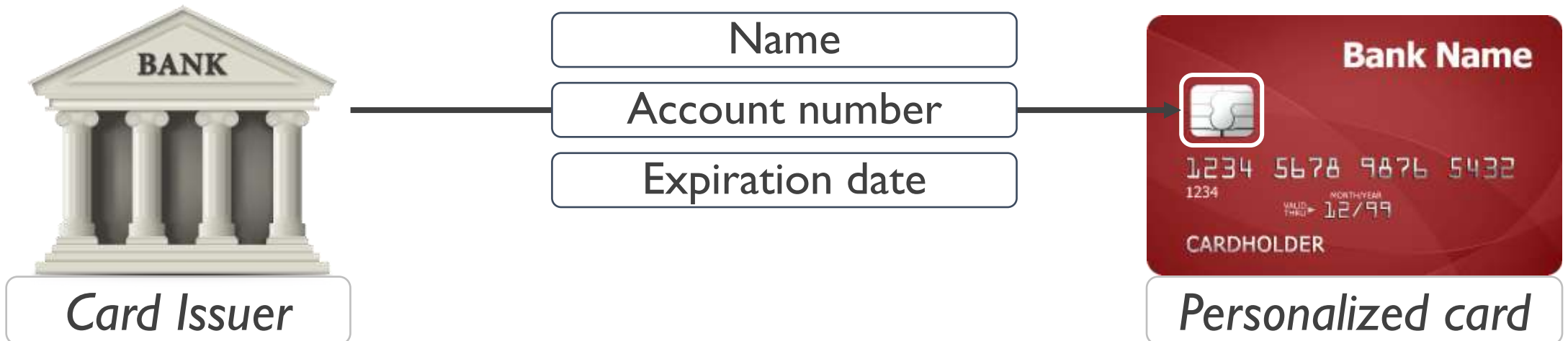
*Let's understand how the card personalization process works*

*Use of data personalization commands that are sent to a card that already contains the basic EMV application software*

**On-card personalization**

# Card personalization

## Card personalization process

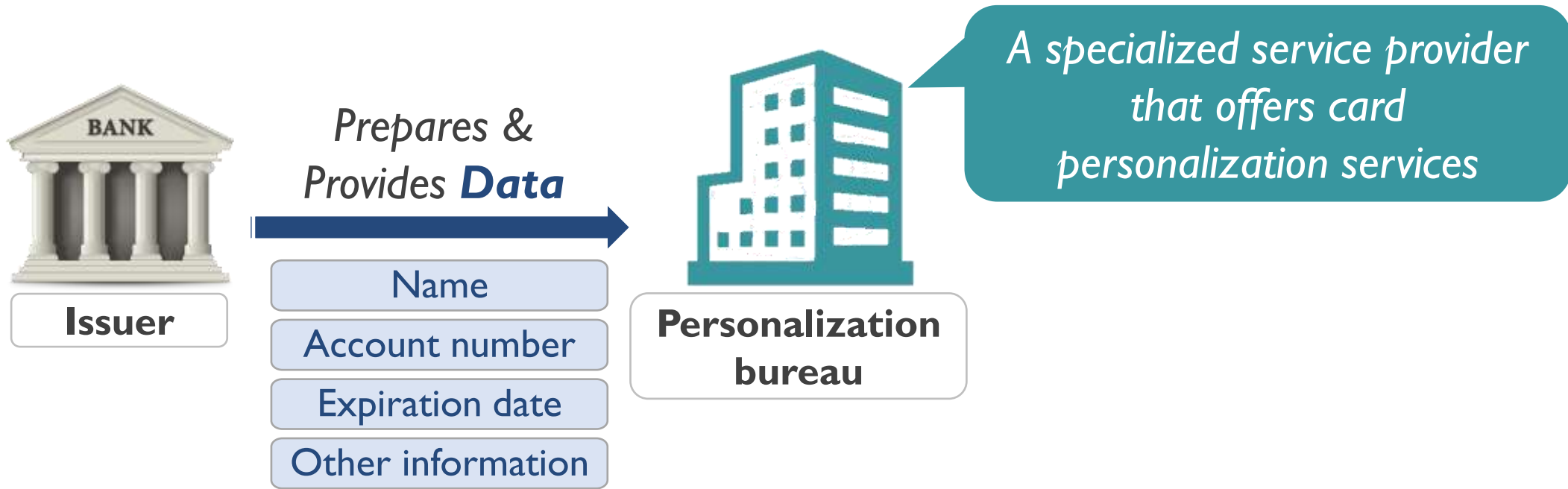


Carried out by a **Card issuer** or **Third-party personalization bureau**

# Card personalization

Processing of personalization device instructions (PDI) and IC card personalization data requires the following three functional steps:

## Data preparation



# Card personalization

Processing of personalization device instructions (PDI) and IC card personalization data requires the following three functional steps:

I

## Data preparation



Issuer

*Prepares &  
Provides **Data***

- Name
- Account number
- Expiration date
- Other information



Personalization  
bureau

*Data is formatted and encrypted  
a/c to the **PDI (Personalization  
Device Instructions)***

**PDI**

*A set of instructions that  
specify **how the data**  
**should be programmed**  
**onto the chip***

# Card personalization

Processing of personalization device instructions (PDI) and IC card personalization data requires the following three functional steps:

## Personalization device set-up



*Specialized machines used to program the data onto the chip*

*Specialized software*

*Encryption keys*

*Security features*



# Card personalization

Processing of personalization device instructions (PDI) and IC card personalization data requires the following three functional steps:

## IC card application processing



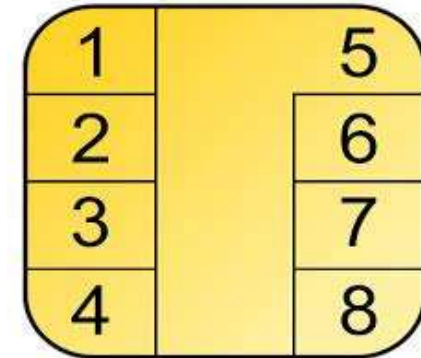
*Loading software programs, also known as applications*



Contactless payments Yes ☐ No

Secure Access Yes ☒ No

Personal Information Yes ☐ No



The background is a collage of various currency notes and symbols, including the Euro (€), US Dollar (\$), and British Pound (£). Overlaid on this are large, semi-transparent numbers (1, 2, 3, 4, 5, 6, 7, 8, 9, 0) and arrows (up, down, left, right) in a light blue color. A central dark blue rectangle with a white border contains the title text in white.

# Approaches to issuing EMV chip cards: Issuer models



# Approaches to issuing EMV chip cards: Issuer models

*To better understand the three functional steps, we just discussed*

Data preparation

Personalization  
device set-up

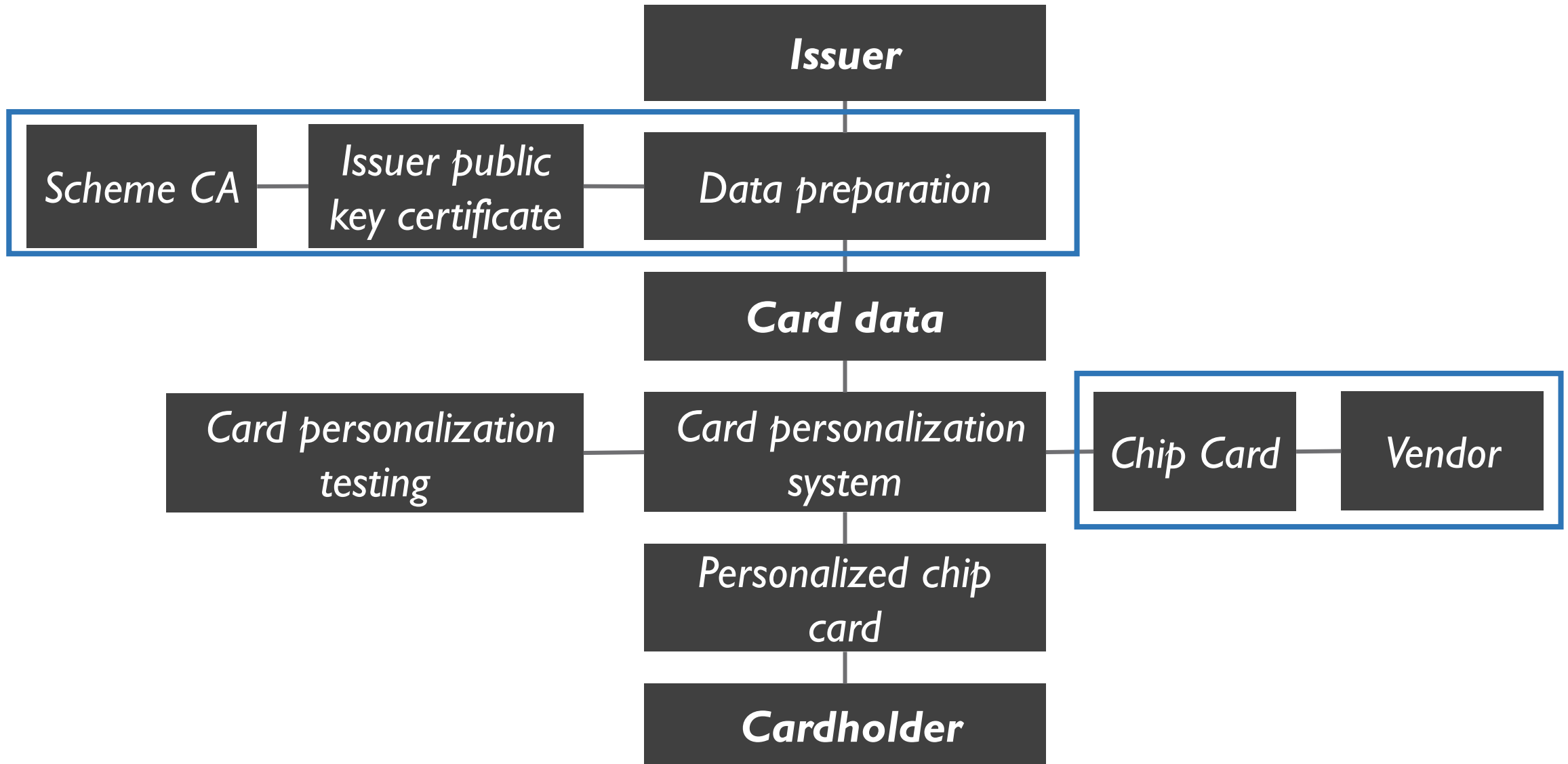
IC card application  
processing

***look at the EMV issuer models***

*Let's first look at the entire process, and then we will segregate it into the issuer models*

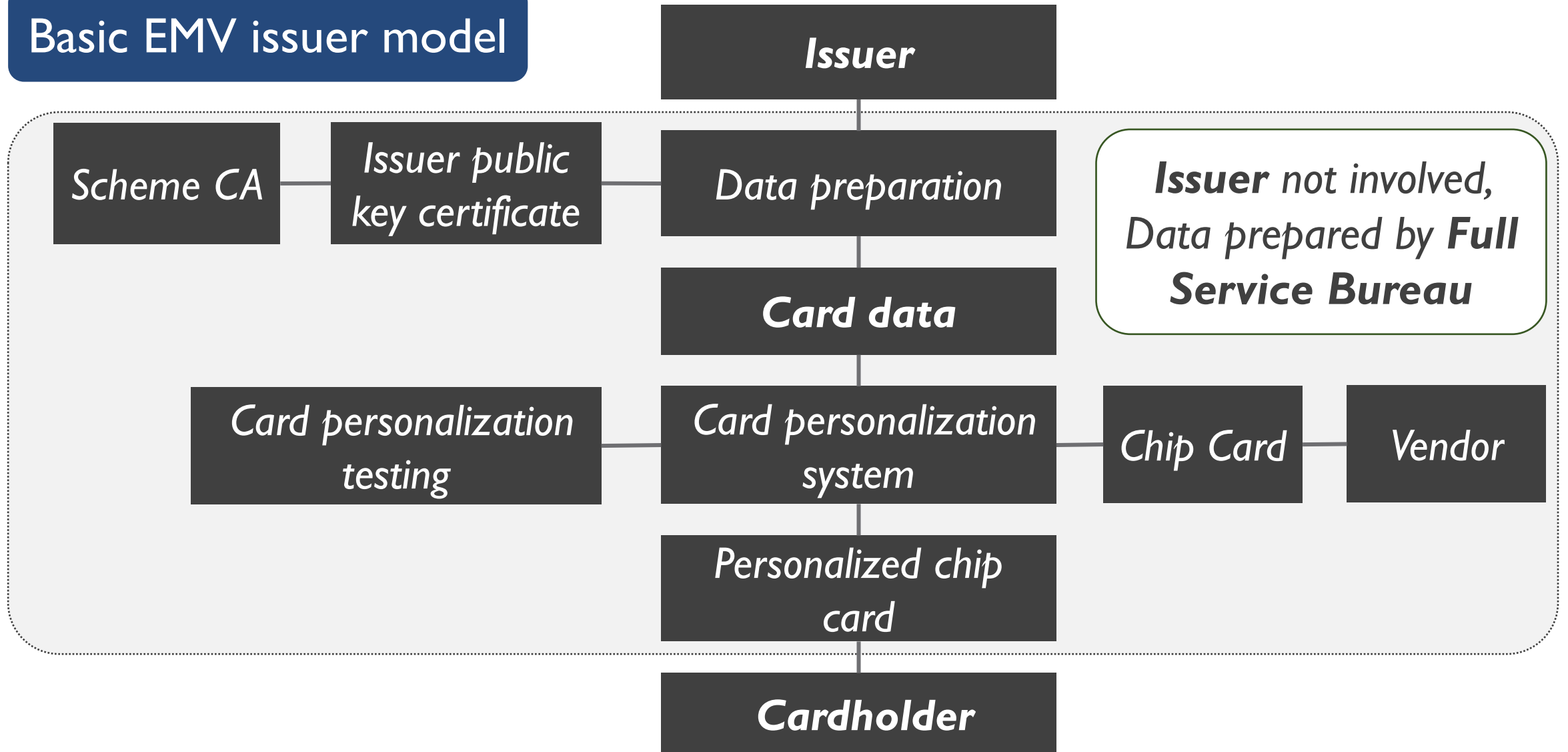


# Approaches to issuing EMV chip cards: Issuer models

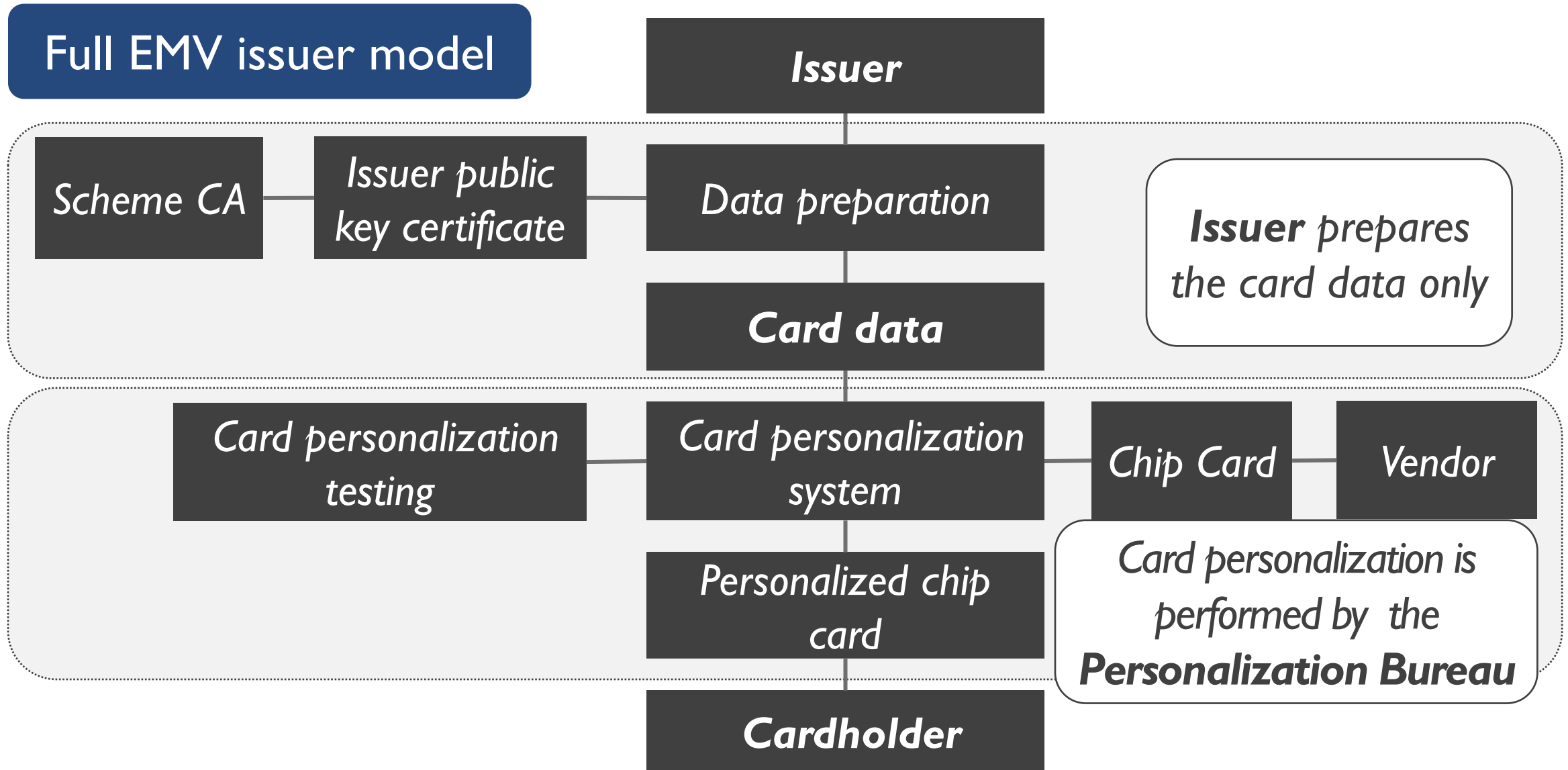


# Approaches to issuing EMV chip cards: Issuer models

## Basic EMV issuer model

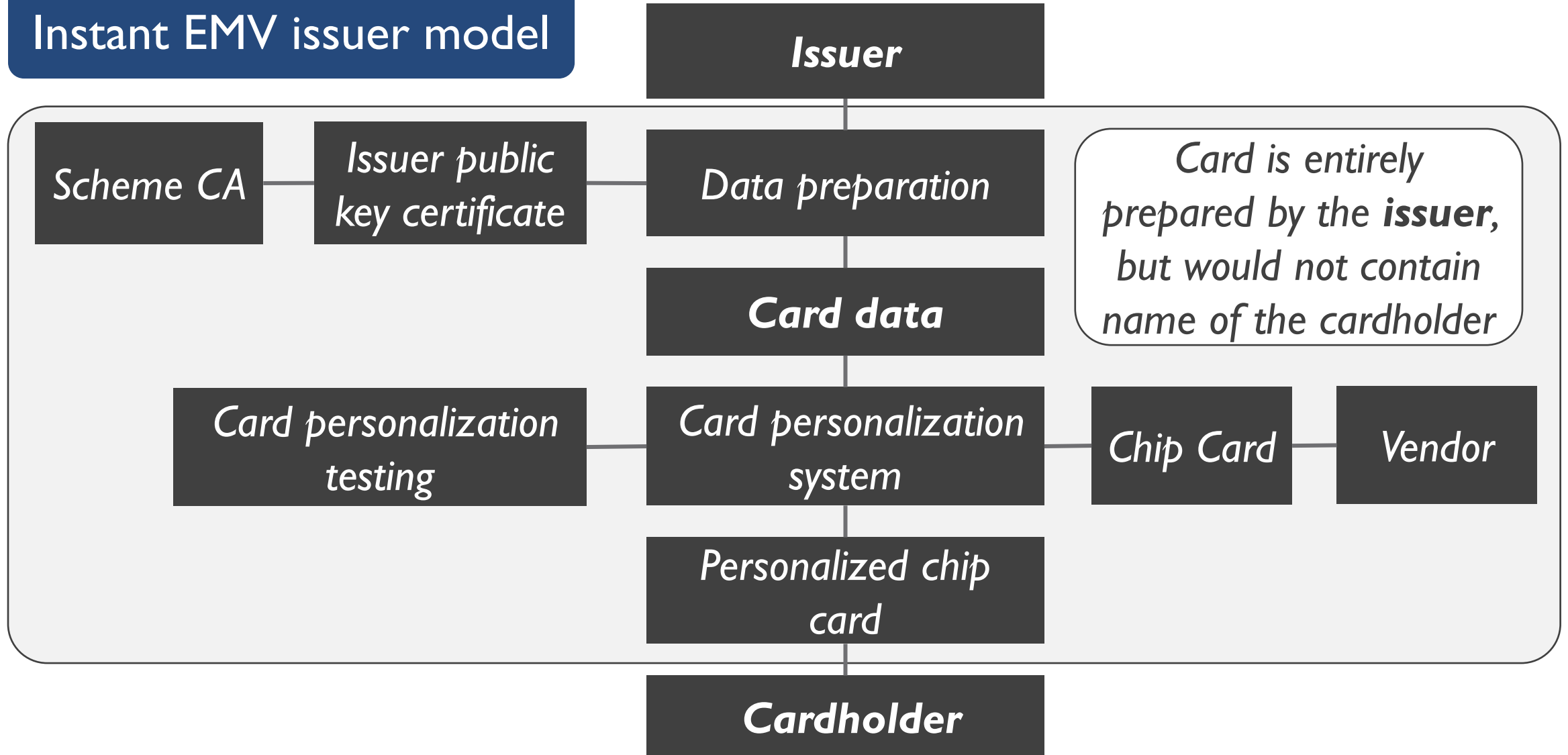


# Approaches to issuing EMV chip cards: Issuer models



# Approaches to issuing EMV chip cards: Issuer models

## Instant EMV issuer model





# BANK OFFICE

## Instant EMV issuer model

*Received a card instantly when you opened an account with your bank*



# Approaches to issuing EMV chip cards: Issuer models

The issuer models used in the card industry to issue cards to customers

Basic EMV issuer  
model

Full EMV issuer  
model

Instant EMV issuer  
model

The background is a collage of various currency symbols and banknotes. Large, semi-transparent numbers (1, 2, 3, 4, 5, 6, 7, 8) and symbols (€ and \$) are scattered across the image. Orange arrows point from some of these numbers towards the central title box. The title box is a dark blue rectangle with a white border, containing the text "Methods for card personalization" in white. The overall color scheme includes orange, blue, and green.

# Methods for card personalization

# Methods for card personalization

Two methods specified by EMVCo for card personalization



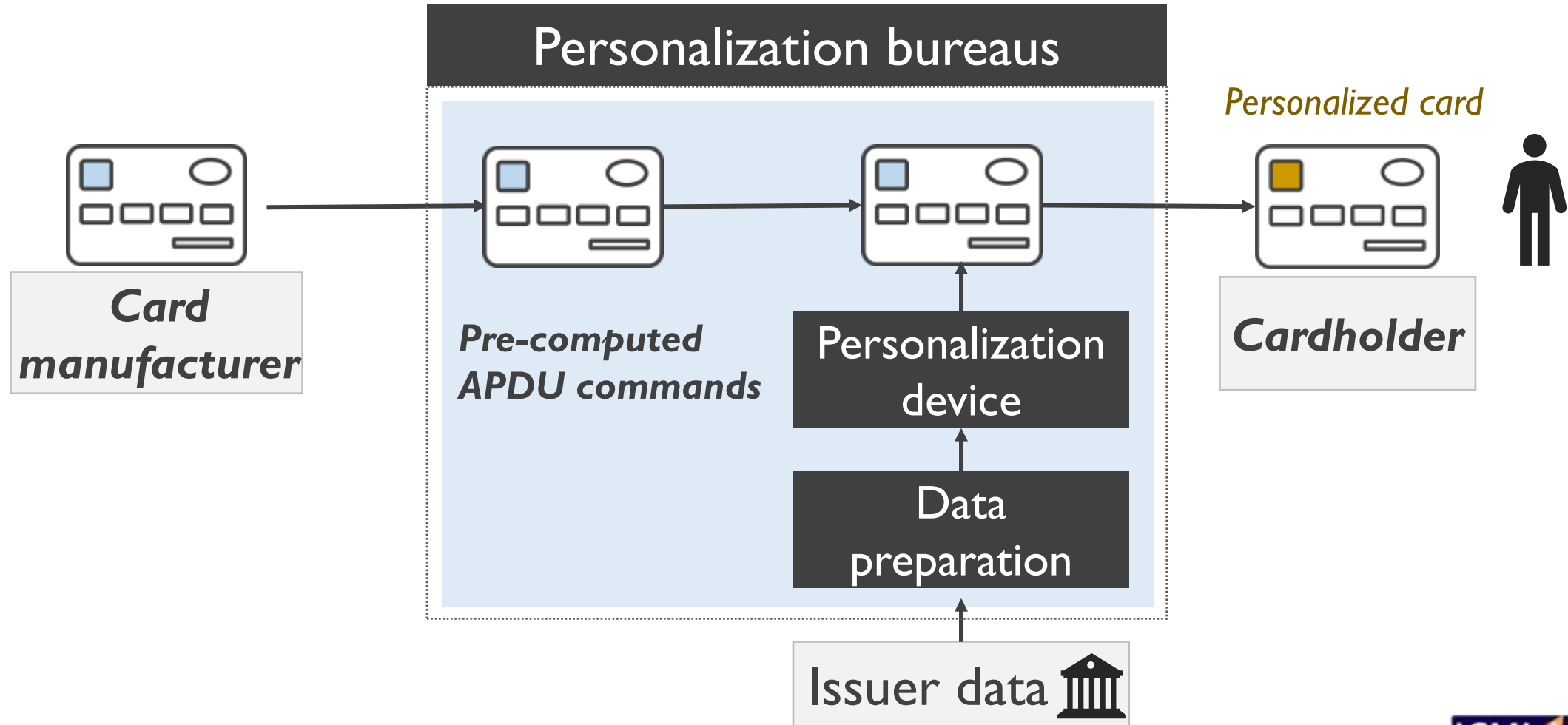
**How the application and data are loaded into the IC?**

**Direct method**

**Indirect method**

# Methods for card personalization

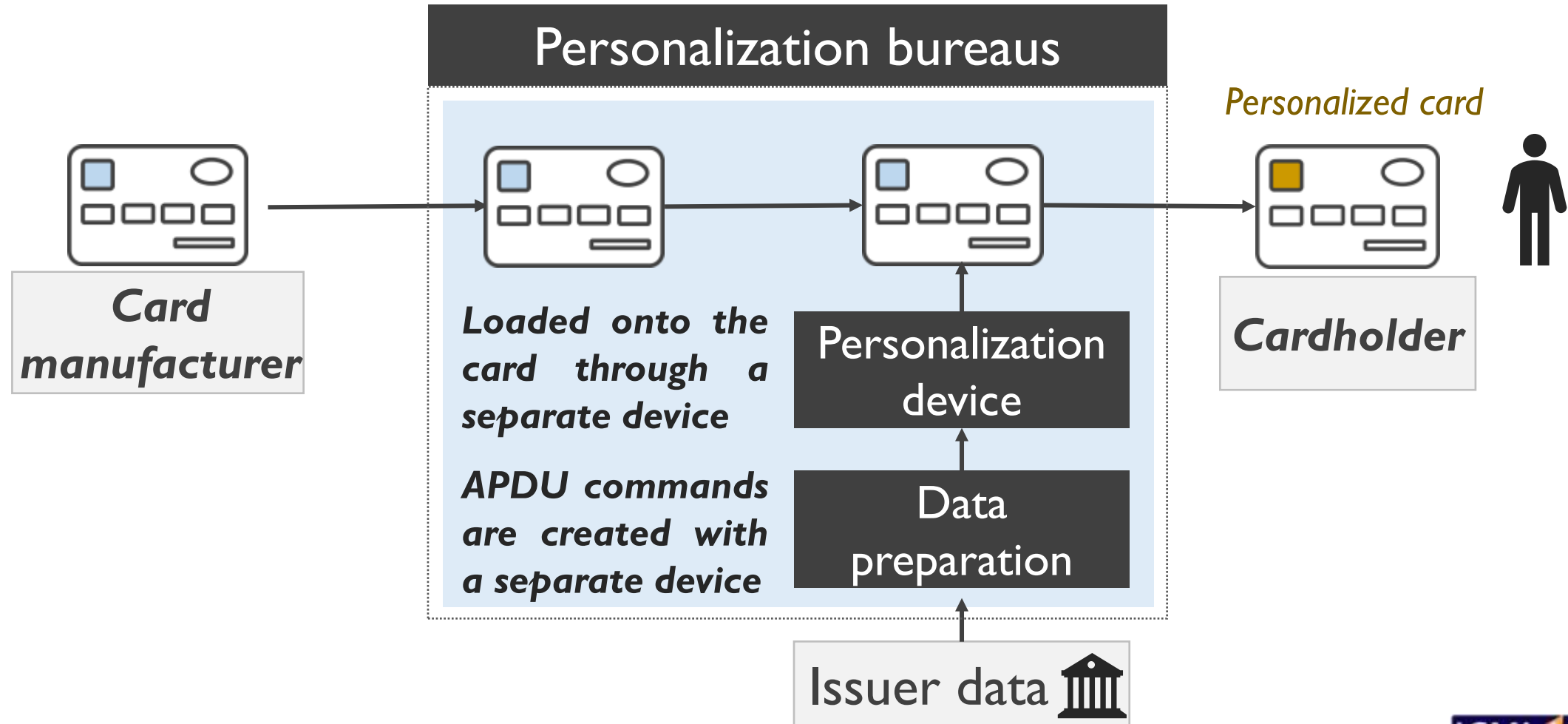
## Direct method





# Methods for card personalization

## Indirect method

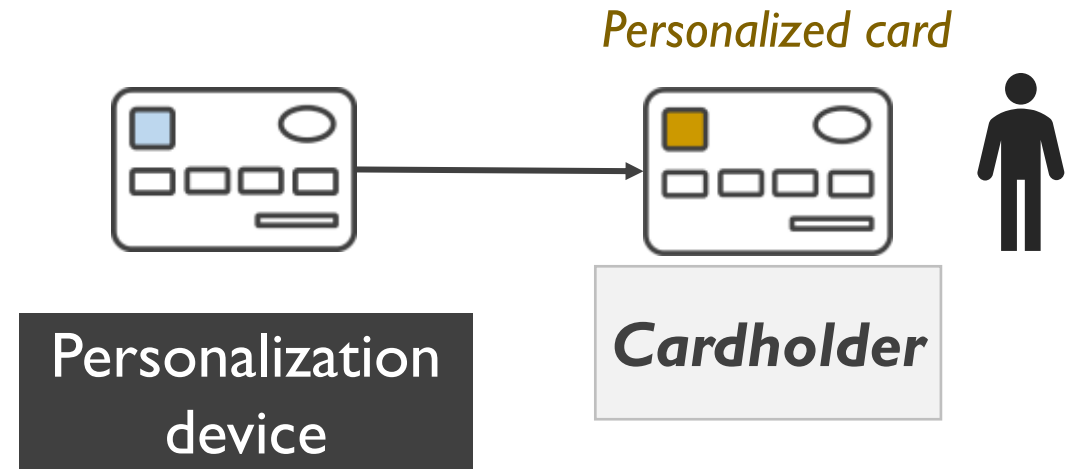


# Methods for card personalization

## Application Protocol Data Unit (APDU) commands

*Used in the card personalization process to load data onto the chip card*

The APDU commands are specific to the card's operating system and application

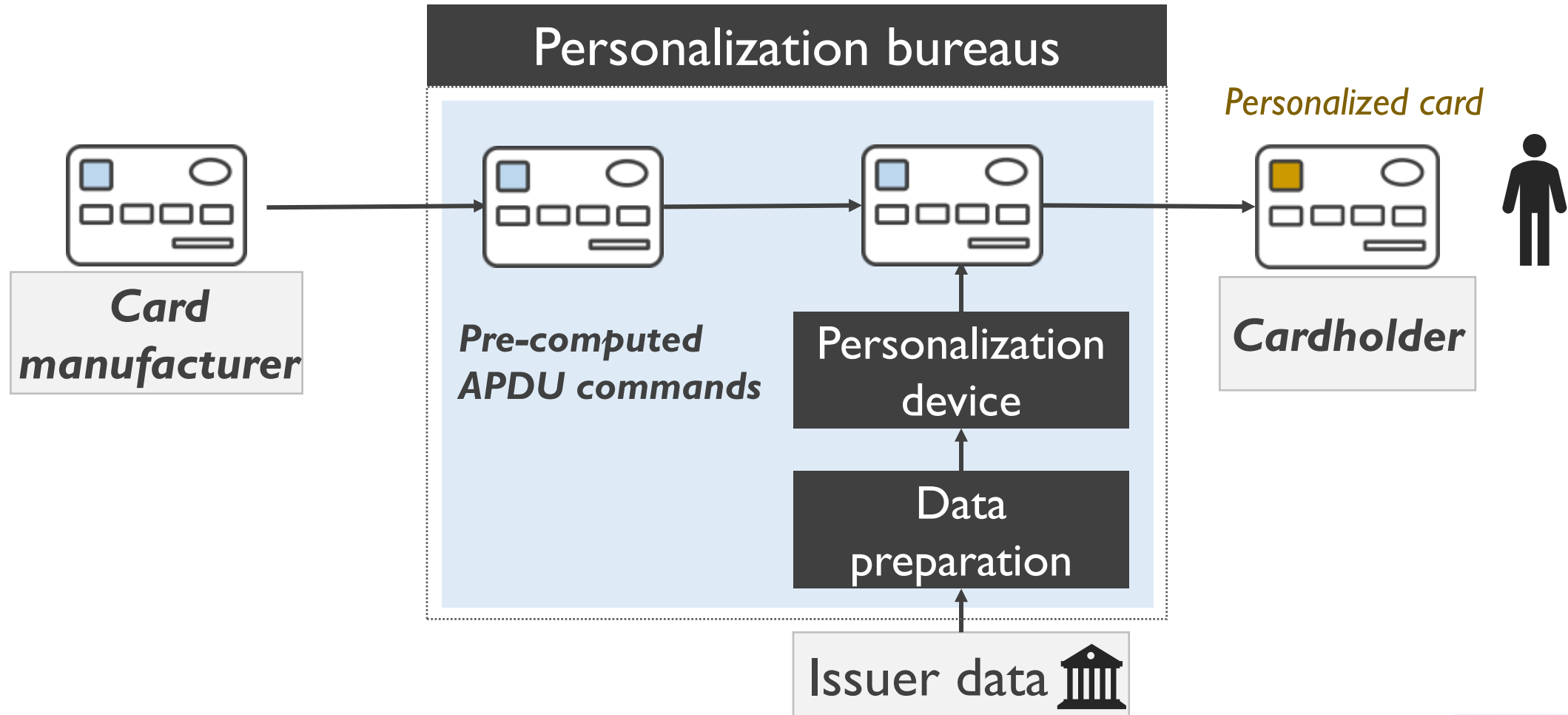


The structure of the APDU is defined by ISO/IEC 7816-4

# Methods for card personalization

## Direct method

### Single security zone



# Methods for card personalization

## Indirect method

*Two security zones*

