Privacy-Aware E-coupons

**E-coupons**

- Coupons are an essential part of many digital marketing strategies.
- There is a risk of fraud associated with electronic coupons (e-coupons).
- In the USA, e-coupon crime losses are estimated to cost around 300-600 million dollars annually.
- Hence the interest in developing innovative ways for secure distribution and use of e-coupons.

**Loyalty Benefits**

- The customers earn digital cash/point/coin per their purchases:
  - Reward coins to elevate status for having benefits.
  - Digital coins to buy discounts, exchange for real money, and transfer to another customer.
  - Digital coins can be used to buy reward coins to elevate the status.
  - Elevated status provides better coupons and discounts.

**Goals of the Protocol**

- The goal is to give e-coupons as advertisements to those who use the APP.
- The store decides how many and what kind of e-coupons to distribute.
- The issuer sets and manages the lifetime of the e-coupons.
- In the meantime, the issuer does not learn who the customer is.

**Security Goals**

- Privacy
  - Shop should not learn the customer’s identity unless they show it.
  - Server does not learn the identities of the individual customers.
- Unforgeability
  - Only the issuer offers valid e-coupons.
- Transferability
  - E-coupons can be made transferable.

**E-Coupon APP** is an application that grants e-coupons for shops to its users when they are in the range of the shopping mall that hosts the shops.

User with E-coupon APP in their device is near a shopping mall.

User receives a notification of a discount for the Shop in the Mall.

User opens the notification.

User goes into the Mall to go to the Shop.

User enters the Shop.

User gets a unique QR code for the discount.

User presents the QR code to the cashier to get the discount.

QR code is deactivated in the APP after the use.