

Session III : Tools

김경구 / Ground X

# Klaytn Blockchain Application<sup>(BApp)</sup> Development



김경구, Kai Kim

## Lead of Blockchain Application, Ground X

- Klip 개발
- Klaytn related contracts 개발 / 검증
- KLAY distribution tools 개발

## Blockchain Researcher, Bithumb

- Ethereum 기반 smart contracts 개발
- Ethereum, EOS, Steem, Bitcoin 리서치 & 거래소 로직 개발
- 거래소 입/출금 로직을 위한 HSM/KMS 리서치 & 개발

## Embedded SW Engineer / Pattern Recognition Researcher

- Embedded device의 secure module 리서치 & 개발
- Robot vision & object recognition 리서치 & 개발

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- 3-3. Multi-signature

# 01. BApp (Blockchain Application)

1-1. BApp 이란?

1-2. 최신 BApp 동향

# BApp 이란?

Blockchain Application - 블록체인을 사용하여 동작하는 모든 어플리케이션

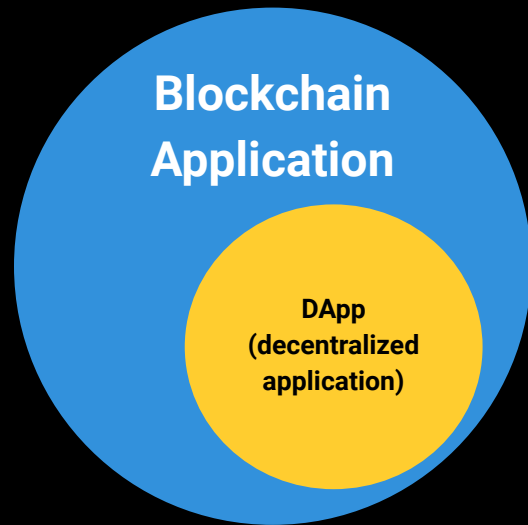
## BApp의 특징

중앙서버를 거치지 않음

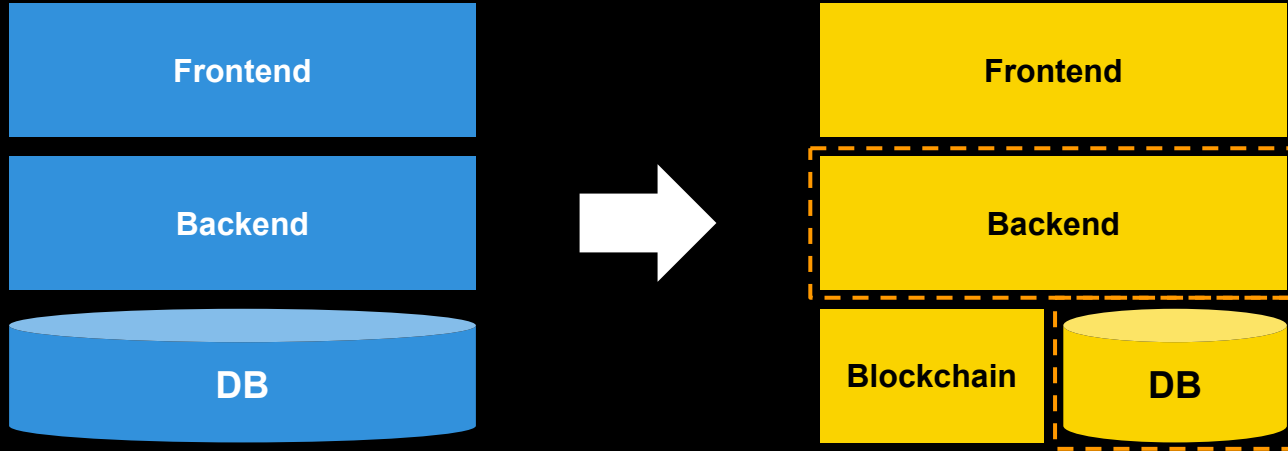
Smart Contract 기반

BApp 사용자 - Key base (private key & public key)

App에서 사용하는 결제 시스템과 신분 증명등의 복잡한 설정이 필요 없음



# BApp 이란?



# 최신 BApp 동향

## - NFT : Non Fungible Tokens

Digital Scarcity (디지털 희소성) - 유일성, 소유권, 거래 보장

Crypto Collectibles, Digital Goods, Digital Ticket/Coupon, Digital Ownership...



## - DID : Decentralized Identifiers

## - DeFi : Decentralized Finance

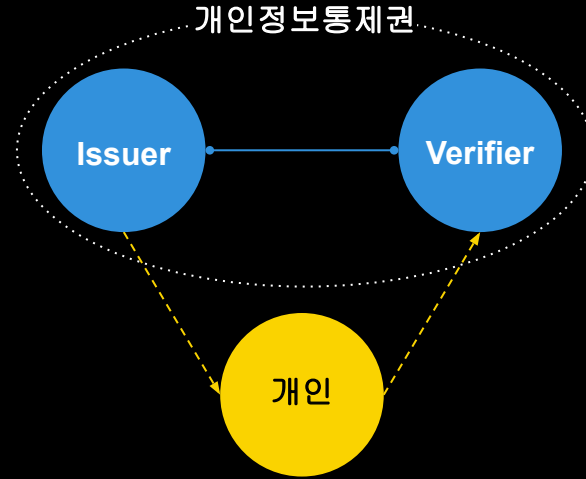
# 최신 BApp 동향

- NFT : Non Fungible Tokens

- DID : Decentralized Identifiers

자기 주권 신원 (Self-Sovereign Identity) 등장  
블록체인 기반 "모바일 전자증명"

- DeFi : Decentralized Finance





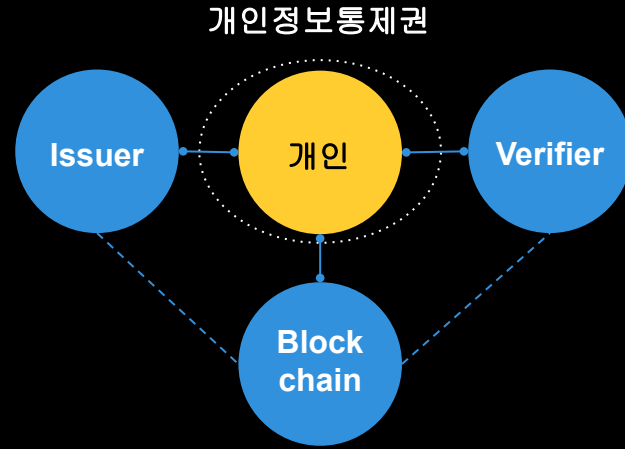
# 최신 BApp 동향

- NFT : Non Fungible Tokens

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- DeFi : Decentralized Finance



# 최신 BApp 동향

- **NFT : Non Fungible Tokens**

- **DID : Decentralized Identifiers**

- **DeFi : Decentralized Finance**

탈중앙화 금융

Lending, Stablecoin, Payment, Staking, DEX, Insurance, Asset Tokenization

크립토 बैं킹 - 초과담보 모델을 이용하여 심사, 인증 없이 탈중앙 대출/예금

## 02.Klaytn DX Tools

2-1. Klaytn SDK

2-2. Klaytn Wallet

2-3. Klaytn IDE

2-4. Klaytn Scope

## BApp = UI + 컨트랙트



# Klaytn Wallet

The screenshot shows the Klaytn Wallet interface. On the left is a dark sidebar with navigation options: 'Create Account', 'View Account Info', 'Send KLAY & Token', 'KLAY Faucet', and 'More'. The main content area is titled 'STEP 3' and displays a progress indicator with three steps, the third being active. The heading reads 'Please Save Your Klaytn Wallet Key'. Below this, it states 'Your new account has been created. Please copy and securely store the Klaytn Wallet Key below.' Two key values are shown in highlighted boxes with 'COPY' buttons: the 'Private Key' and the 'Klaytn Wallet Key'. At the bottom of the main area are two buttons: 'View Account Info' and 'Send KLAY & Token'. The footer of the sidebar contains copyright information and social media icons. The browser's taskbar at the bottom shows the application name 'keyston...' and a window title '모두 표시'.

Klaytn Wallet

Baobab Testnet

✓ — ✓ — 3

**STEP 3**

### Please Save Your Klaytn Wallet Key

Your new account has been created.  
Please copy and securely store the Klaytn Wallet Key below.

**Private Key**

```
0xf89cf38465ecc85db322856a02f7e6d072b97d42101b0bada2a4e90244298f6e
```

COPY

**Klaytn Wallet Key**

```
0xf89cf38465ecc85db322856a02f7e6d072b97d42101b0bada2a4e90244298f6e0x000xd0e608a89a259390cdf5ee8373cfbdc0a7156c87
```

COPY

View Account Info

Send KLAY & Token

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keyston...json

모두 표시

# Klaytn IDE

The screenshot displays the Klaytn IDE interface with the following components:

- File Browser:** Located on the left, it shows a project structure with files like `count.sol`, `IERC20.sol`, `SafeMath.sol`, and `ERC20.sol`.
- Code Editor:** The central area contains the Solidity source code for a contract named `Count`. The code includes a pragma statement for Solidity versions `>=0.4.24 <=0.5.6`, a storage variable `count`, and two public functions: `getBlockNumber` and `setCount`.
- Compiler Panel:** On the right, the 'Compile' tab is active. It shows the current version as `0.5.6+commit.b259423e.Emscripten.clang`. A dropdown menu for 'Select new compiler version' is open, with `0.5.6+commit.b259473e` selected. Other options include `0.4.24+commit.e6710`. There are checkboxes for 'Auto compile', 'Enable Optimization', and 'Hide warnings', and a 'Start to compile (Ctrl-S)' button.
- Transaction List:** At the bottom, there is a search bar and a list of transactions. The first entry is labeled 'Count'.

# Klaytn Scope

Search by Block# / TX Hash / Account

Network is healthy | Baobab Network

## Account

0xd0e608a89a259890cdf5ee8373cfbd0a7156c87 [COPY](#)

### Overview

Address (Hex) 0xd0e608a89a259890cdf5ee8373cfbd0a7156c87 [COPY](#) Total TXs 12 TXs

Balance 4.984545025 KLAY

### Transactions

Internal Transactions Upcoming!

TX HASH	BLOCK #	TIME	FROM	TO	TX CATEGORY	AMOUNT(KLAY)	TX FEE(KLAY)
<a href="#">0x64c8...ccb6c2</a>	12672986	4 mins ago	<a href="#">0xd0e6...156c87</a>	<a href="#">0x13b9...1046d2</a>	Legacy	0.000000	0.000668...
<a href="#">0x983a...425e10</a>	12672975	4 mins ago	<a href="#">0xd0e6...156c87</a>	<a href="#">0x13b9...1046d2</a>	Legacy	0.000000	0.001043...
<a href="#">0x9949...bd8b55</a>	12672960	4 mins ago	<a href="#">0xd0e6...156c87</a>	<a href="#">0x13b9...1046d2</a>	Legacy	0.000000	0.003042...
<a href="#">0xd32b...90c10c</a>	12672796	7 mins ago	<a href="#">0xd0e6...156c87</a>	<a href="#">0xea84...1cc261</a>	Legacy	0.000000	0.000668...
<a href="#">0x0f48...4ff9d2</a>	12672791	7 mins ago	<a href="#">0xd0e6...156c87</a>	<a href="#">0xea84...1cc261</a>	Legacy	0.000000	0.000668...
<a href="#">0xffdf...86f524</a>	12672779	7 mins ago	<a href="#">0xd0e6...156c87</a>	<a href="#">0xea84...1cc261</a>	Legacy	0.000000	0.001043...
<a href="#">0x9fdc...a18e72</a>	12672766	7 mins ago	<a href="#">0xd0e6...156c87</a>	<a href="#">0xea84...1cc261</a>	Legacy	0.000000	0.003042...
<a href="#">0xa365...ba38cb</a>	12672584	10 mins ago	<a href="#">0xd0e6...156c87</a>	<a href="#">0xb9b6...03abf</a>	Legacy	0.000000	0.000668...
<a href="#">0x93e7...61a36a</a>	12672575	11 mins ago	<a href="#">0xd0e6...156c87</a>	<a href="#">0xb9b6...03abf</a>	Legacy	0.000000	0.001043...
<a href="#">0x7721...bfe5df</a>	12672548	11 mins ago	<a href="#">0xd0e6...156c87</a>	<a href="#">0xb9b6...03abf</a>	Legacy	0.000000	0.003042...
<a href="#">0x7c3e...e77f81</a>	12669512	1 hour ago	<a href="#">0xd0e6...156c87</a>	<a href="#">0xd0e6...156c87</a>	Value Transfer	0.100000	0.000525
<a href="#">0x298e...033ec4</a>	12669488	1 hour ago	<a href="#">0xf906...ddc90a</a>	<a href="#">0xd0e6...156c87</a>	Value Transfer	5.000000	0.000525

First < 1 / 1 > Last

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baobab.scope.klaytn.com/tx/0xd0e608a89a259890cdf5ee8373cfbd0a7156c87

## 03.Klaytn Features & Use cases

3-1. Fee delegation

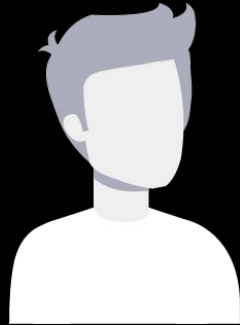
3-2. Role based key

3-3. Multi-signature

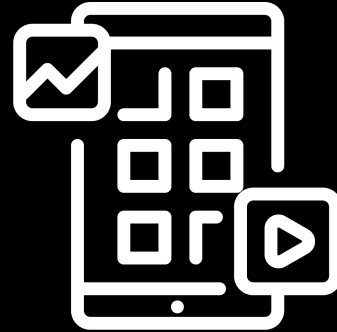


# Fee delegation

Transaction fee?  
KLAY?

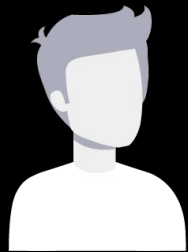


**User**

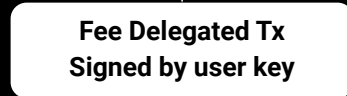


**BApp Service**

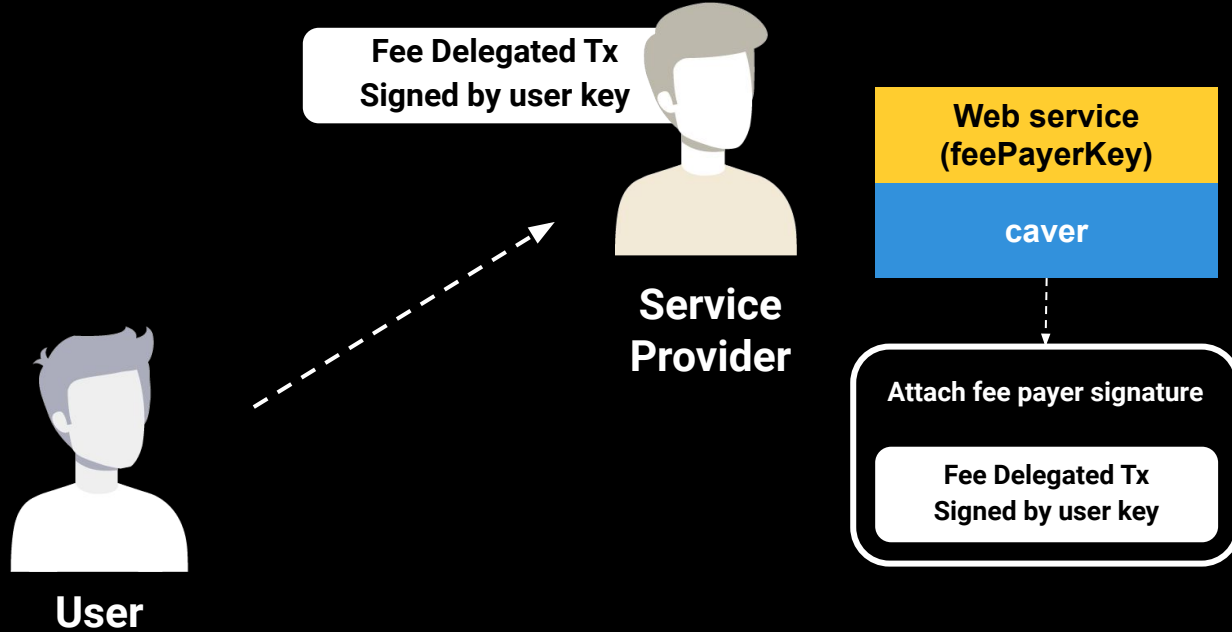
# Fee delegation



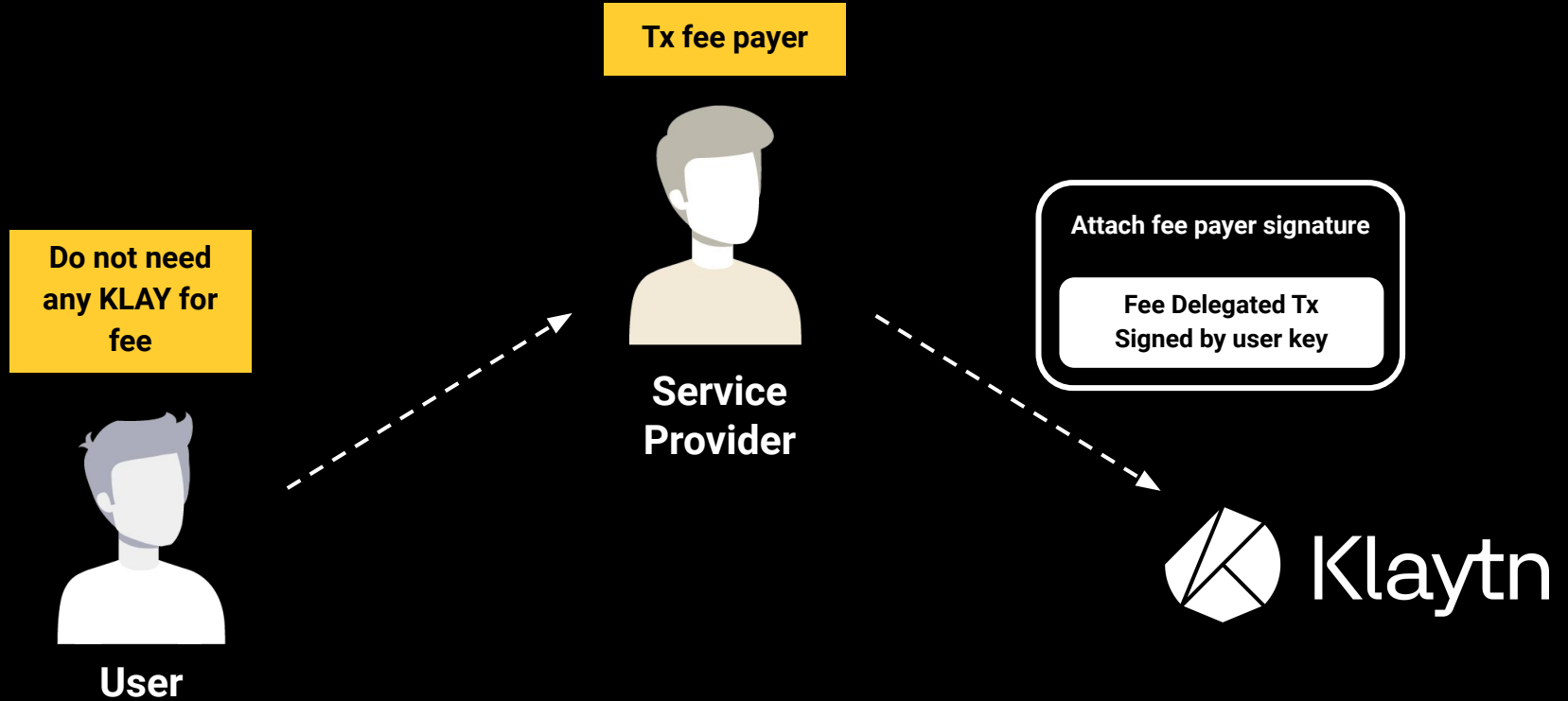
**User**



# Fee delegation



# Fee delegation



# Role based key

## - RoleTransaction

기본키

특정 Account 의 Klay 전송, Smart Contract 실행등의 트랜잭션을 생성하기 위한 키

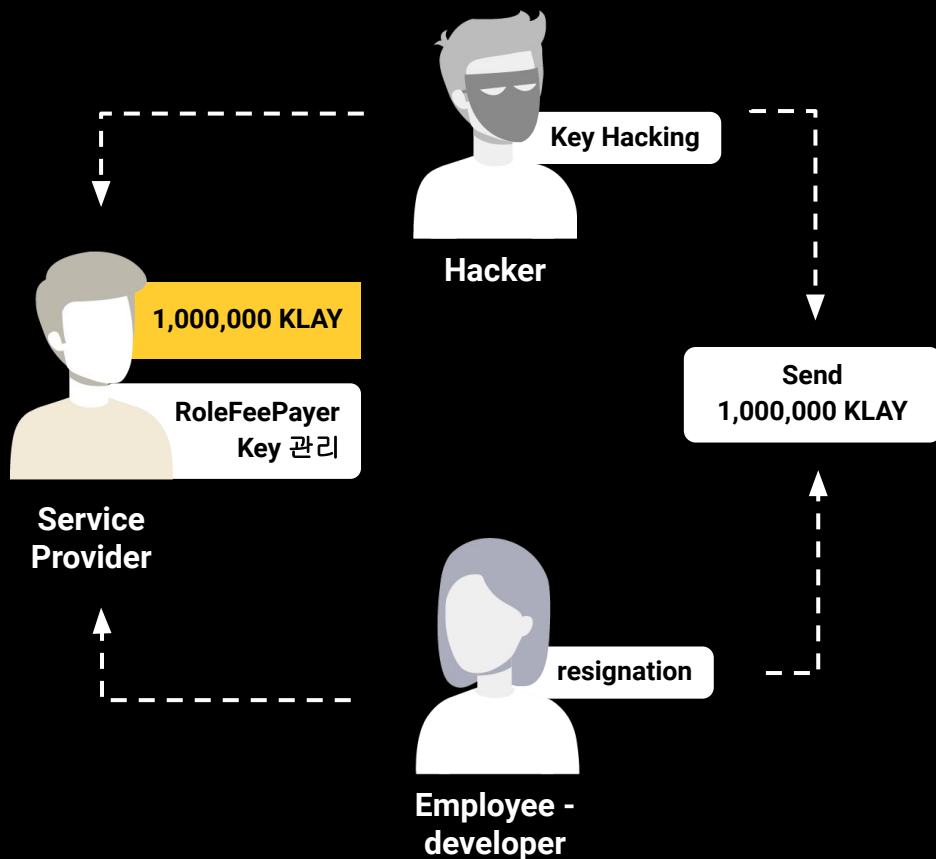
## Role based key

### - RoleFeePayer

이 계정이 발신자 대신 트랜잭션 수수료를 보낼 때 해당 키로 트랜잭션에 서명

### - Use Case

Service 제공을 위해 수수료 대납 할 경우  
수수료 납입을 위한 key 노출 위험이 있는 경우



## Role based key

### - RoleAccountUpdate

Account Update 트랜잭션을 생성하기 위한 키  
해당 키로 RoleTransaction 키와 RoleFeePayer 키를 업데이트 할 수 있음

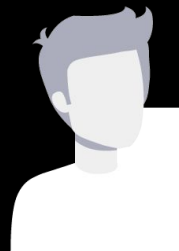
### - Use Case

User Key 분실 시 본인 인증 후 Key update



RoleAccountUpdate  
Key 관리

**Service  
Provider**



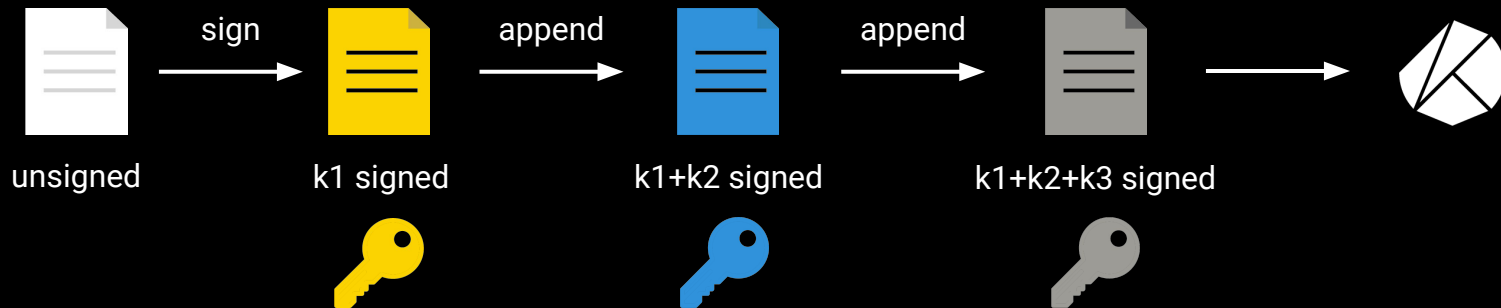
RoleTransaction  
Key 관리

**User**

# Multi-signature

## - Use case

순차적 서명

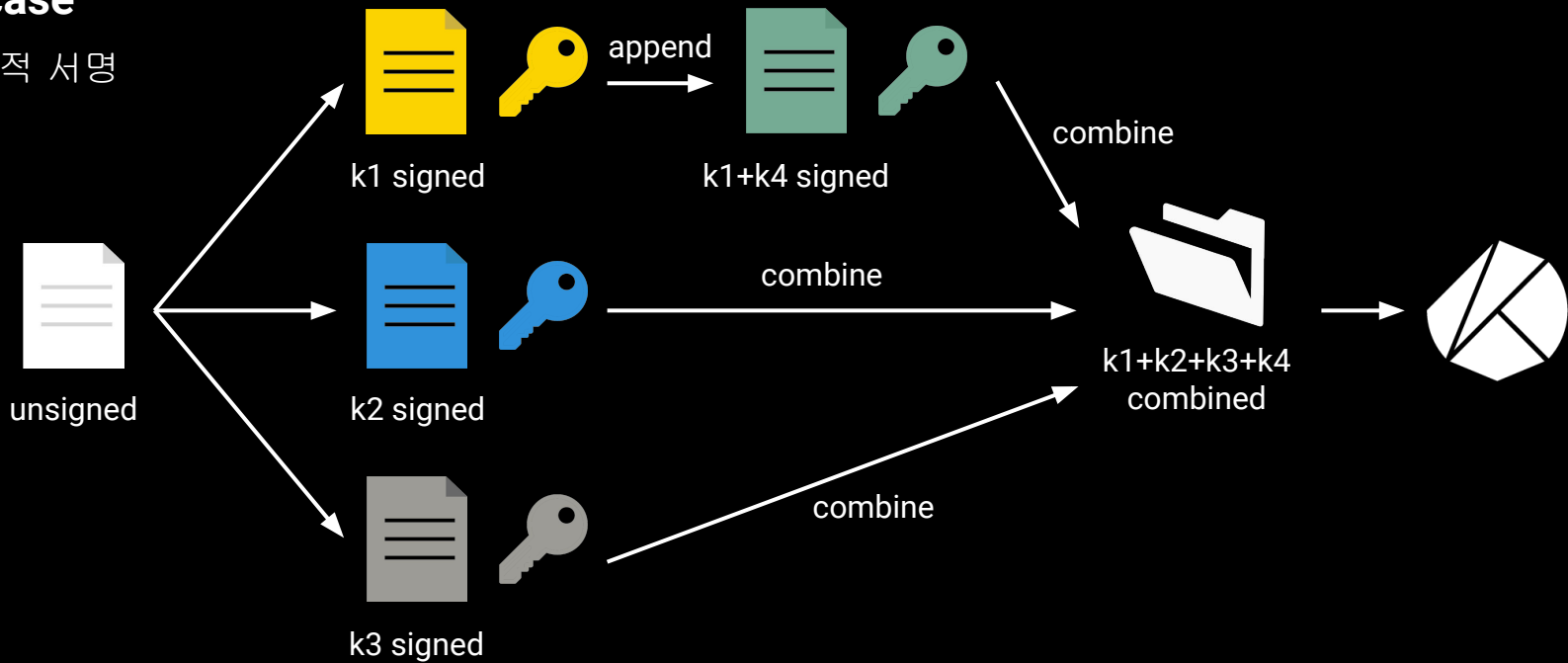




# Multi-signature

## - Use case

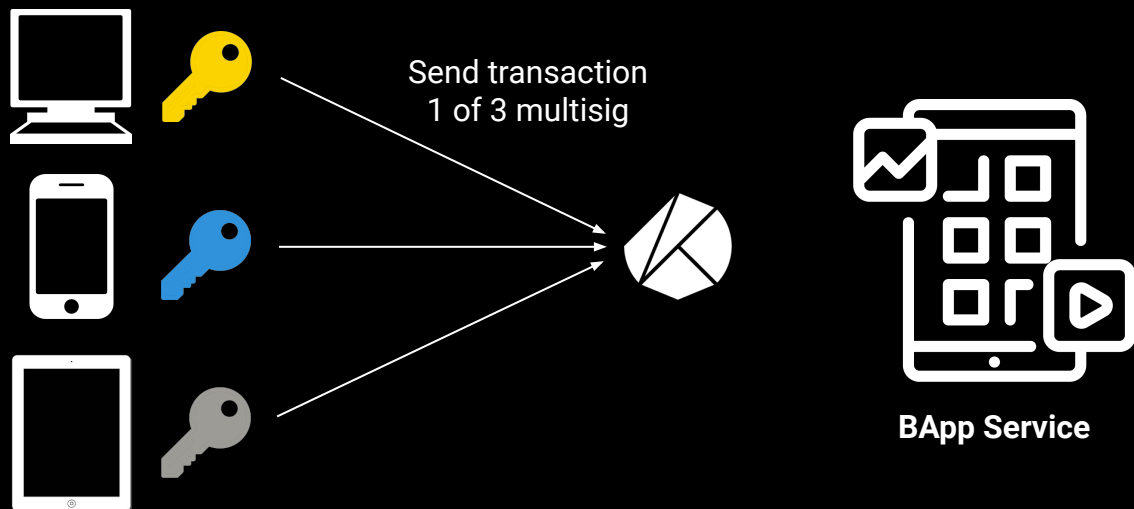
비순차적 서명



# Multi-signature

## - Use case

한명의 사용자에게 대한 multi-device 사용 관리



**WE ARE  
HIRING!**



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# THANK YOU

Ground X  
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Gangnam-gu, Seoul, Republic of Korea