

Secure Over-The-Air Services in NFC Ecosystems

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1. Building up NFC Ecosystem

Exciting opportunities for stakeholders and great value to consumers

MOBILE OPERATORS

- New channel to existing operator services
- Increased data traffic, new users for data services
- New business opportunities
- New customers
- Create stickiness with added value

BANKS

- More card transactions
- New customers
- New services
- Create stickiness with added value

CONSUMERS with NFC phone



- Always with you
- Online connected
- Proximity interactions
- Customized UIs
- “Active smart card”

TRANSPORT OPERATORS

- Fast transactions
- Cost savings in ticket issuance
- More customers
- New and better services
- Less cash handling
- Leverage the infrastructure investment

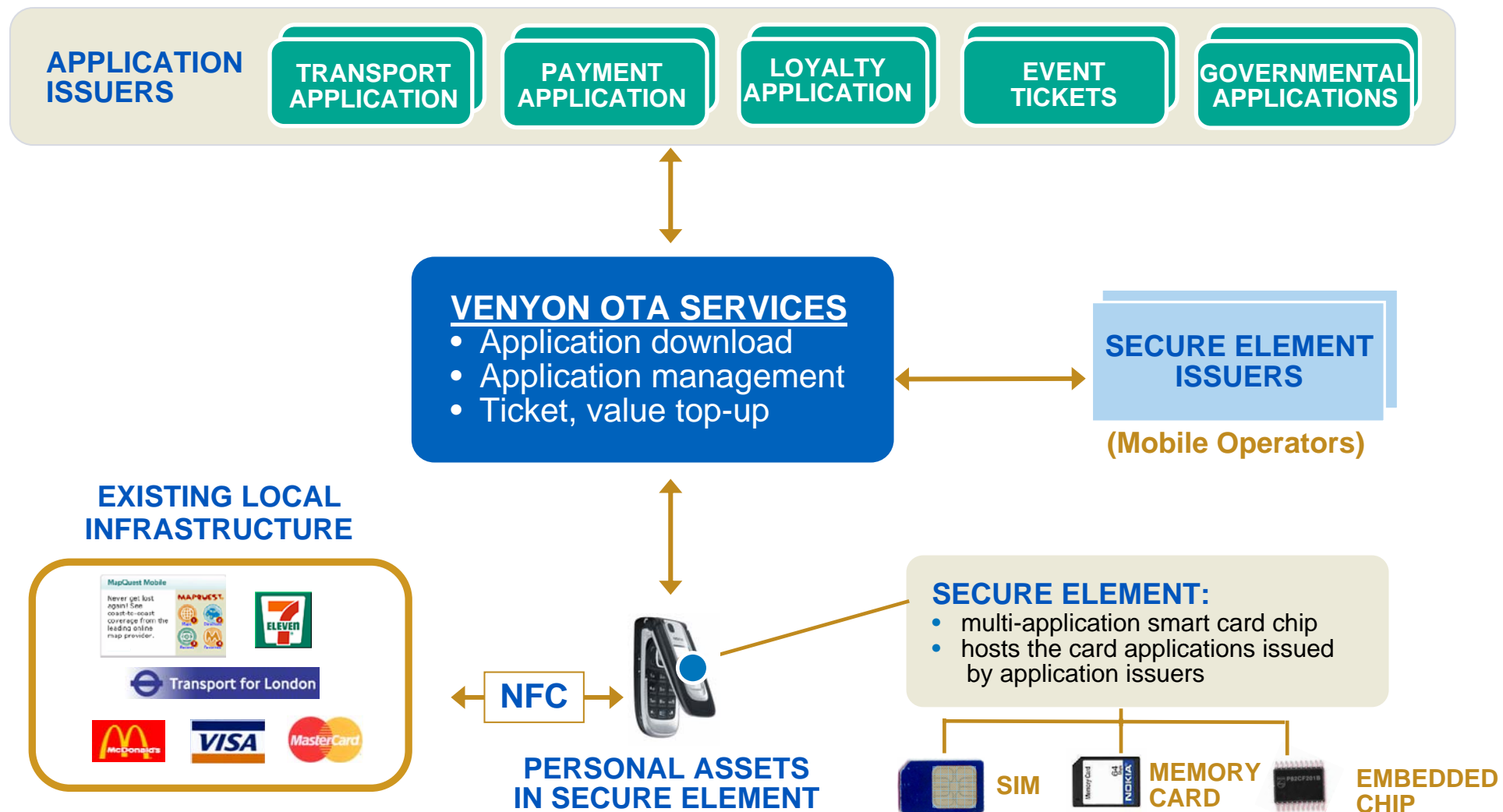
MERCHANTS

- Fast transactions
- Less cash handling
- More customers
- Well targeted loyalty and CRM programs
- Leverage the infrastructure investment

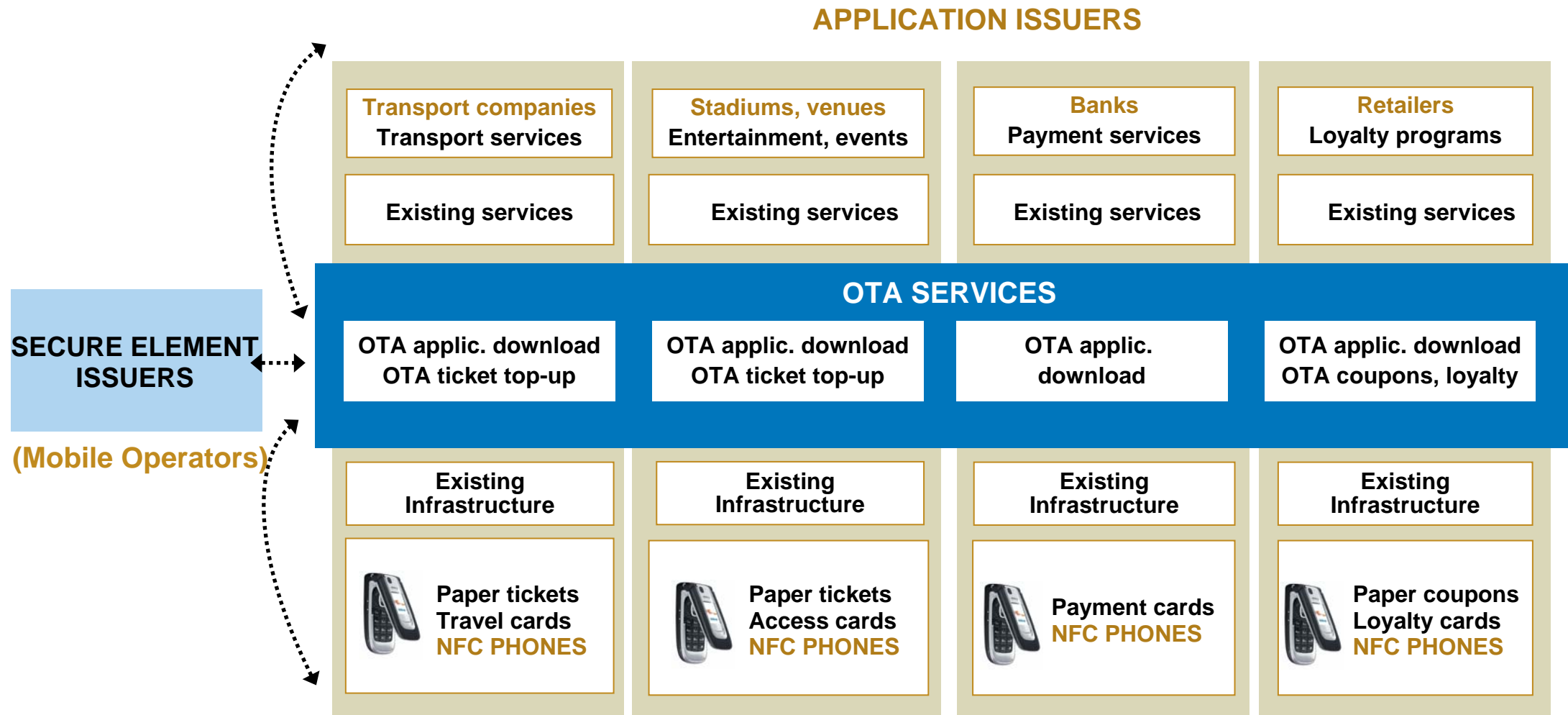
Considerations on the NFC ecosystem

- NFC will be an ecosystem – new services, new business opportunities, intersection of multiple industries
- NFC ecosystem creation will be service driven, not a technology push
- Payment and ticketing are the first applications, other will follow thereafter
- Rollout will start in locations with existing contactless smart card infrastructure
 - NFC is compatible with the infrastructure and thus can leverage the investment made for contactless card acceptance
- These locations will provide the natural starting point for infrastructure creation for NFC based service initiation from Smart Poster embedded with NFC tag
- Payment and ticketing applications need to be provisioned over-the-air after the consumer has purchased the NFC phone
 - There is a need for new line of OTA services for the management of applications to be stored in the Secure Element of the NFC phone
- Establishment of the NFC ecosystem calls for cooperation between the stakeholders, such as mobile operators, banks and transport companies

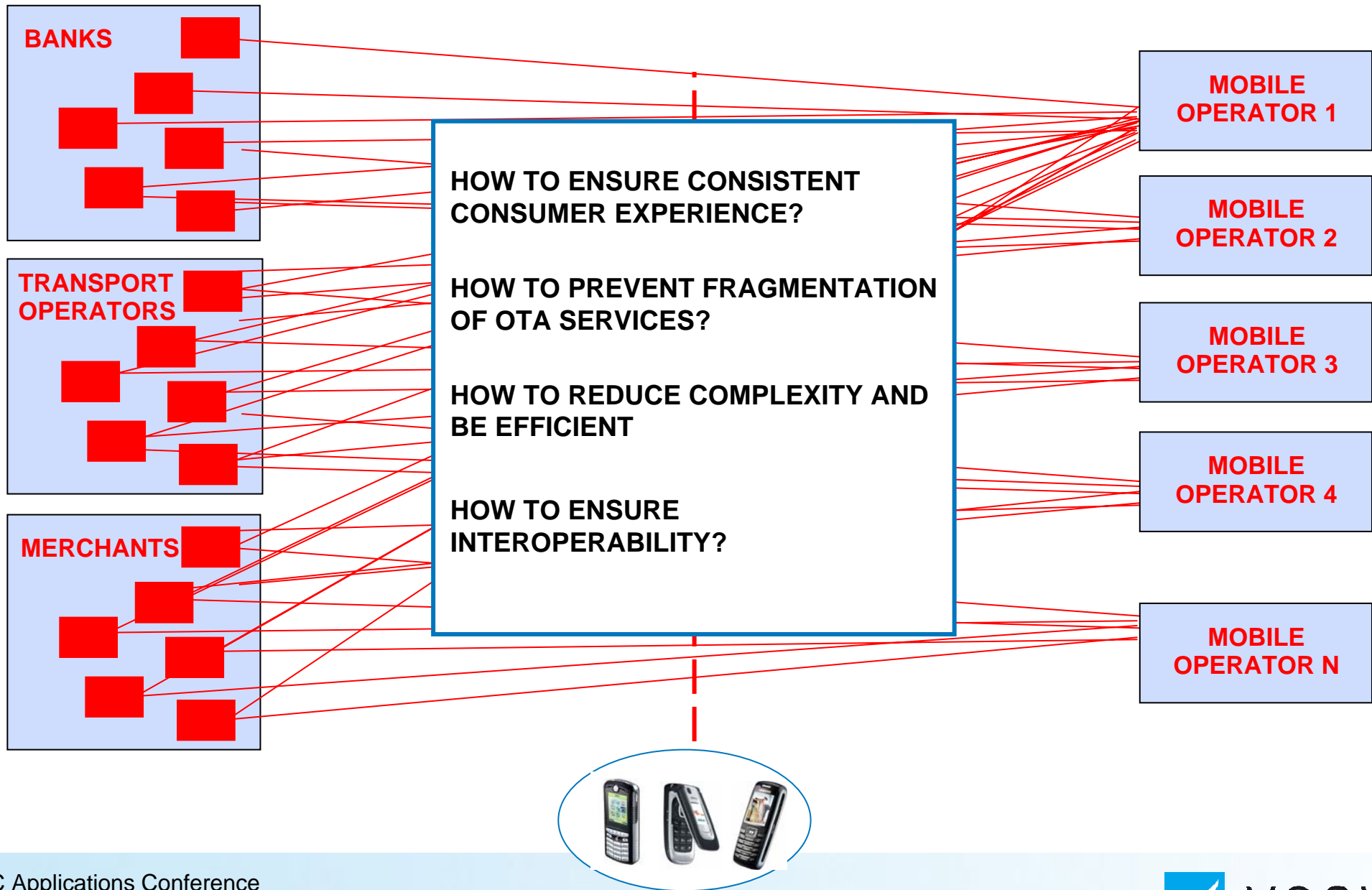
Over-The-Air services to the NFC ecosystem



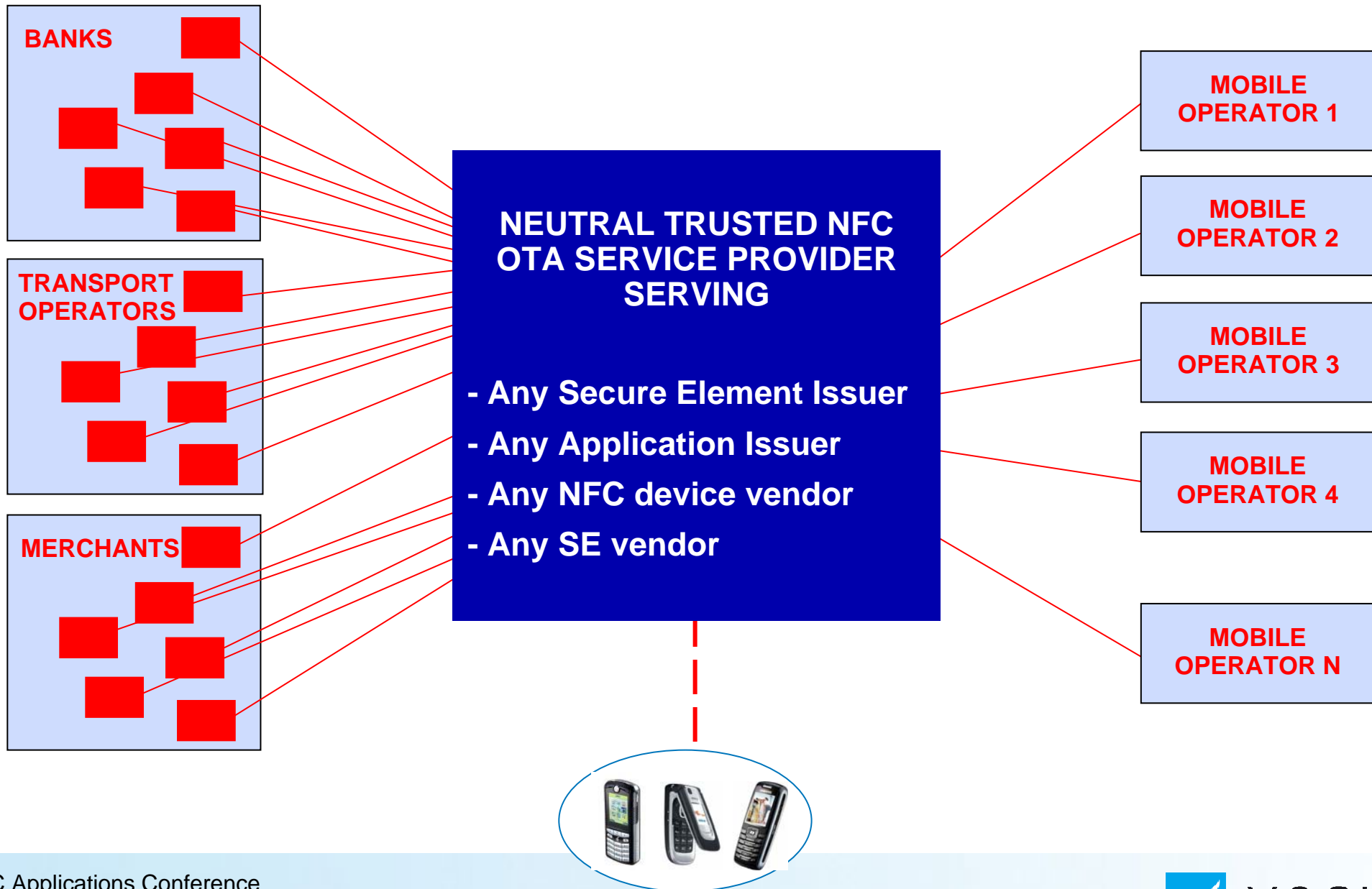
NFC OTA services needed for different industry verticals



Silos and fragmentation can hinder market takeoff

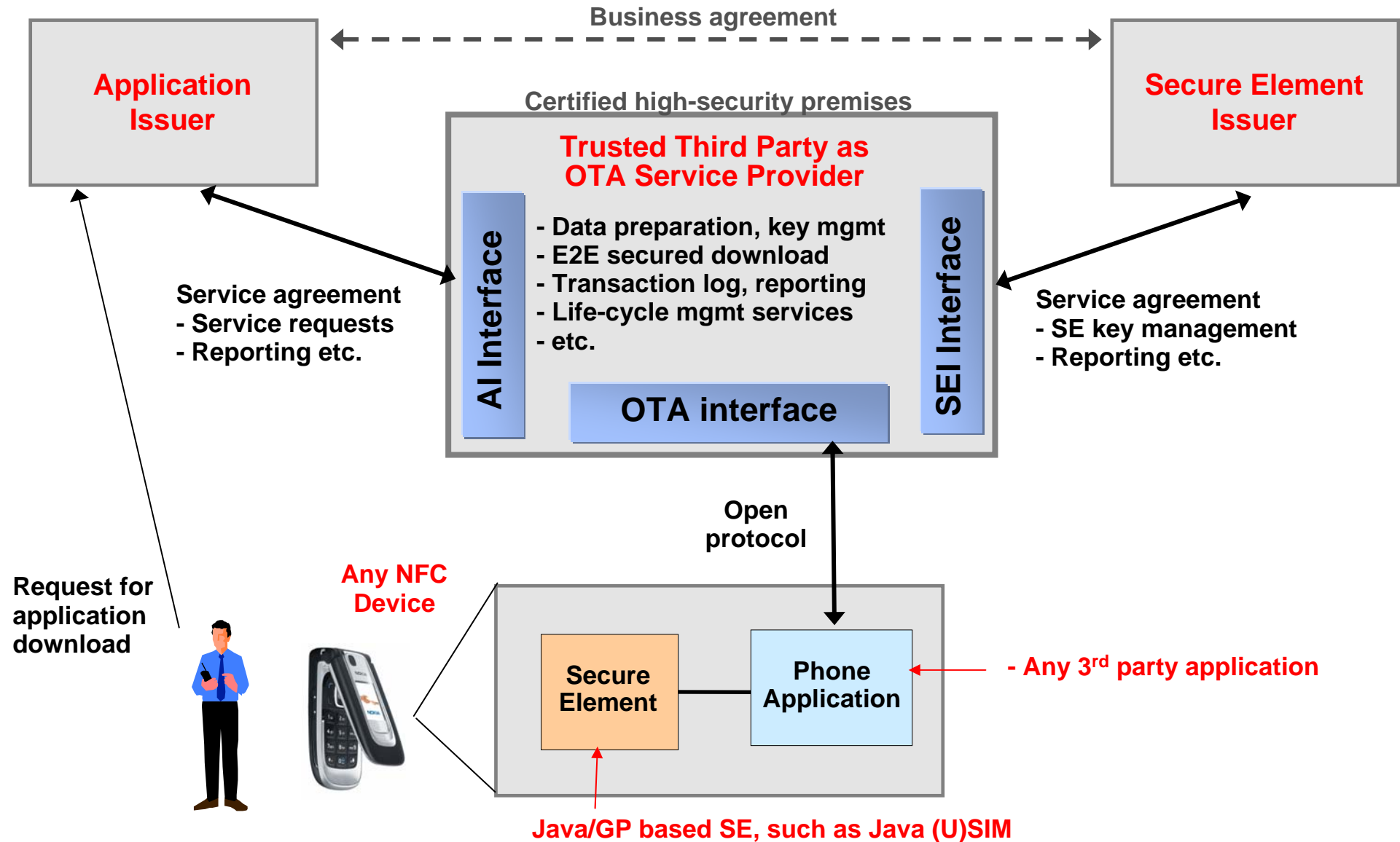


NFC ecosystem needs neutral trusted OTA service providers



2. Value Proposition of Trusted Third Party

TTP based OTA Secure Element management concept



NFC providers great value to consumers

CONSUMERS with NFC phone



- Always with you
- Online connected
- Proximity interactions
- Customized UIs
- “Active smart card”

- Fast and convenient payments
 - No cash, fast check-out
- Fast and convenient ticketing
 - Purchase tickets with mobile, anywhere anytime
- Enhanced loyalty schemes
 - Coupons and vouchers always with you in your mobile
- Browse the card applications and content locally on the phone
- Manage your applications over-the-air
- Easy access to services in your surroundings, with a simple touch of a phone

Venyon – a neutral service enabler for NFC ecosystem

- Venyon has been established and incorporated in December 2006 by Nokia and Giesecke & Devrient for the purpose of creating a neutral NFC ecosystem service provider
- Venyon implements and operates a secure and versatile service platform to be used for the over-the-air provisioning of the consumer applications, such as credit cards and transport tickets, to consumers' NFC enabled devices
- Venyon is a truly open and independent service company offering its services to all stakeholders in the NFC ecosystem, including all mobile handset and smart card vendors – there is no exclusivity in the relationship with Venyon shareholders
- Venyon operates a white-label business model for hosted OTA services
 - Mobile operators, banks, transport companies and other service providers can utilize the Venyon services for downloading and managing their applications in the consumers' NFC phones while the branding and consumer facing activities remain with these service providers

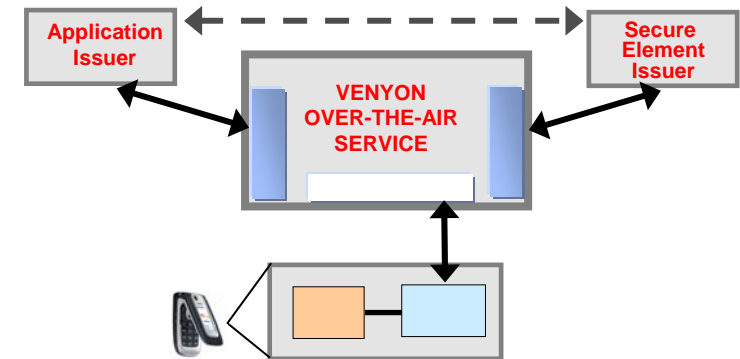
Venyon is already in full operational mode

- Venyon continues the NFC ecosystem OTA service activities started by G&D and Nokia
- OTA service platforms for NFC devices developed by G&D and Nokia and transferred to Venyon, and Venyon continues with the further development of these OTA platforms
- Venyon's core competences in security, smart card, NFC, mobile and server technologies are essential for the development and operation of a reliable and secure service platform
- Venyon has established offices in
 - Europe (Helsinki, Finland and Munich, Germany)
 - US (Dallas, Texas)
 - and will open an office shortly in APAC
- Venyon's first data center is based in Munich, and additional data centers are planned to be established according to the market requirements
- Venyon is engaged in NFC activities in North America, Europe and APAC

3. Venyon Secure Chip Management

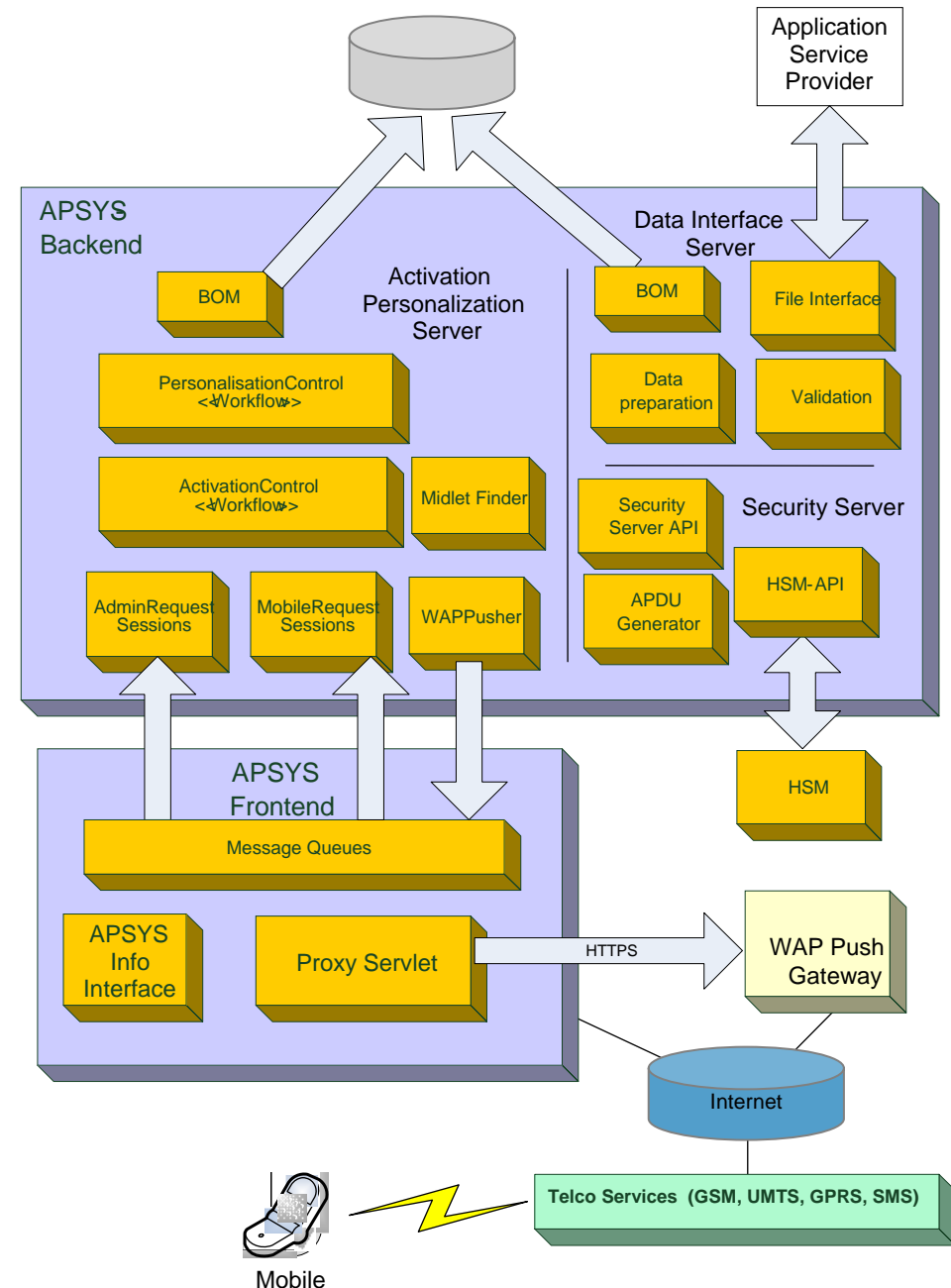
Venyon offers SE application management as a hosted white-label service

- Venyon implements and operates a versatile and secure OTA platform to manage Secure Element applications in NFC enabled devices
- Venyon Secure Element application management is offered as a hosted service
 - White-label business model
- Secure Element Issuer remains as the legal owner of the SE and related keys, while Venyon provides trusted processing services for the Secure Element keys and applications
- Open to all
 - Mobile operators (SE issuers)
 - Service provides issuing SE applications
 - NFC enabled handsets, from all vendors
 - Secure Elements, from all vendors

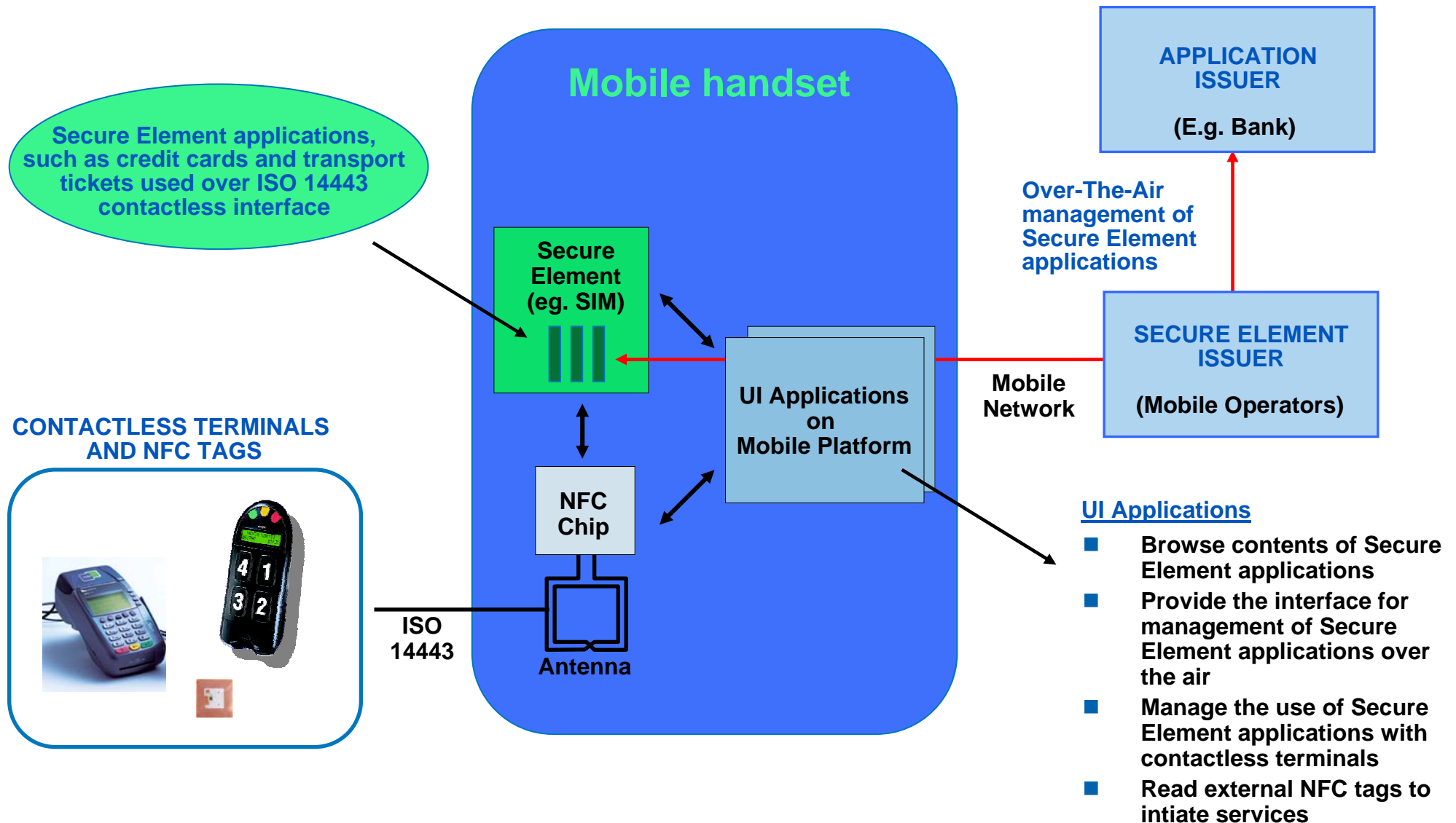


Venyon Secure Chip Management (SCM) Platform

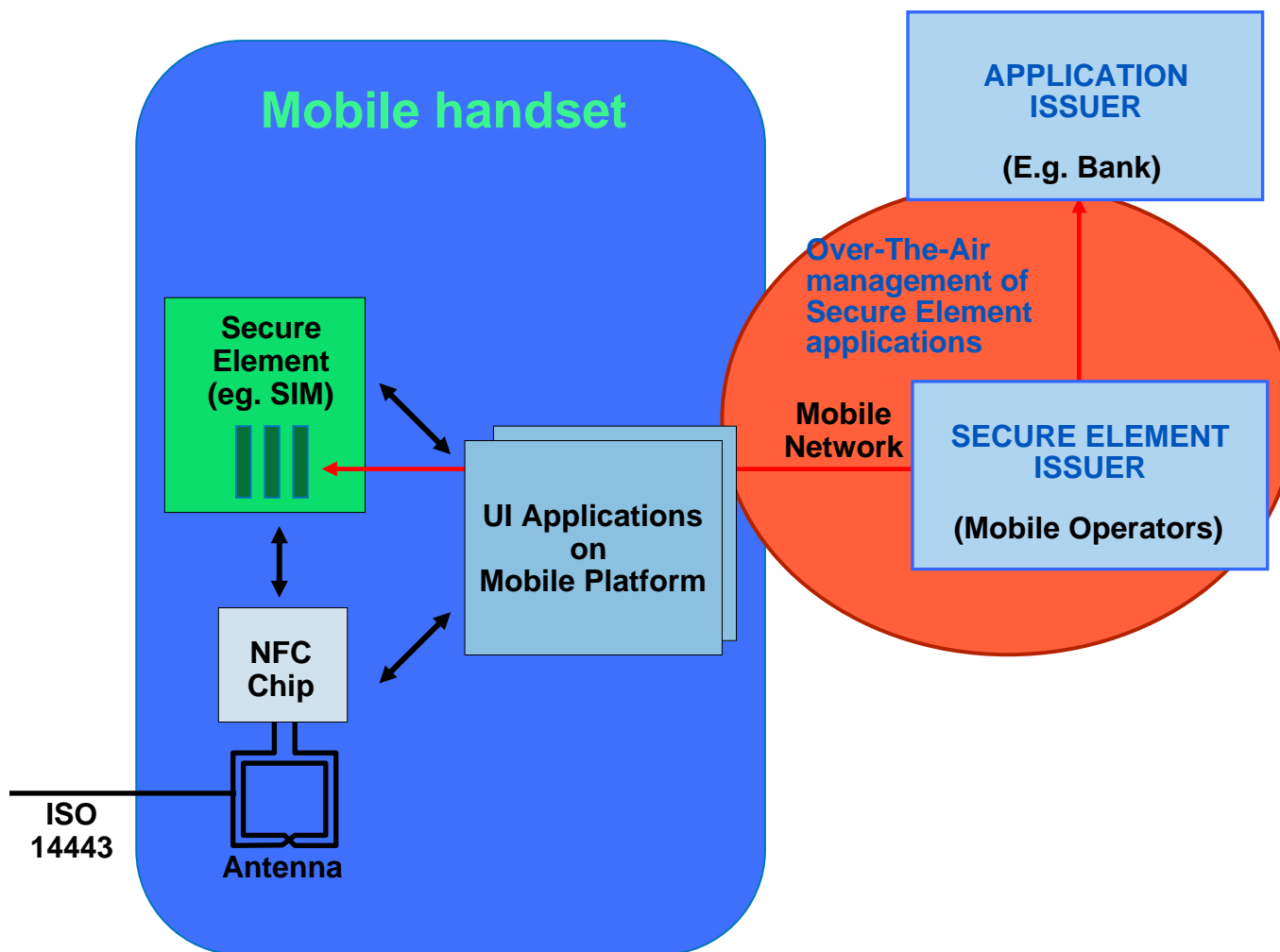
- Venyon Secure Chip Management platform has been implemented for secure and flexible management of all kinds of SE application
- Venyon SCM design enables
 - High security
 - High availability
 - Scalability
- SCM design is modular, which enables smooth integration with external systems & services of
 - Application service providers
 - Mobile operators



Implementing NFC in a mobile device



NFC enabled mobile device – Over-The-Air management



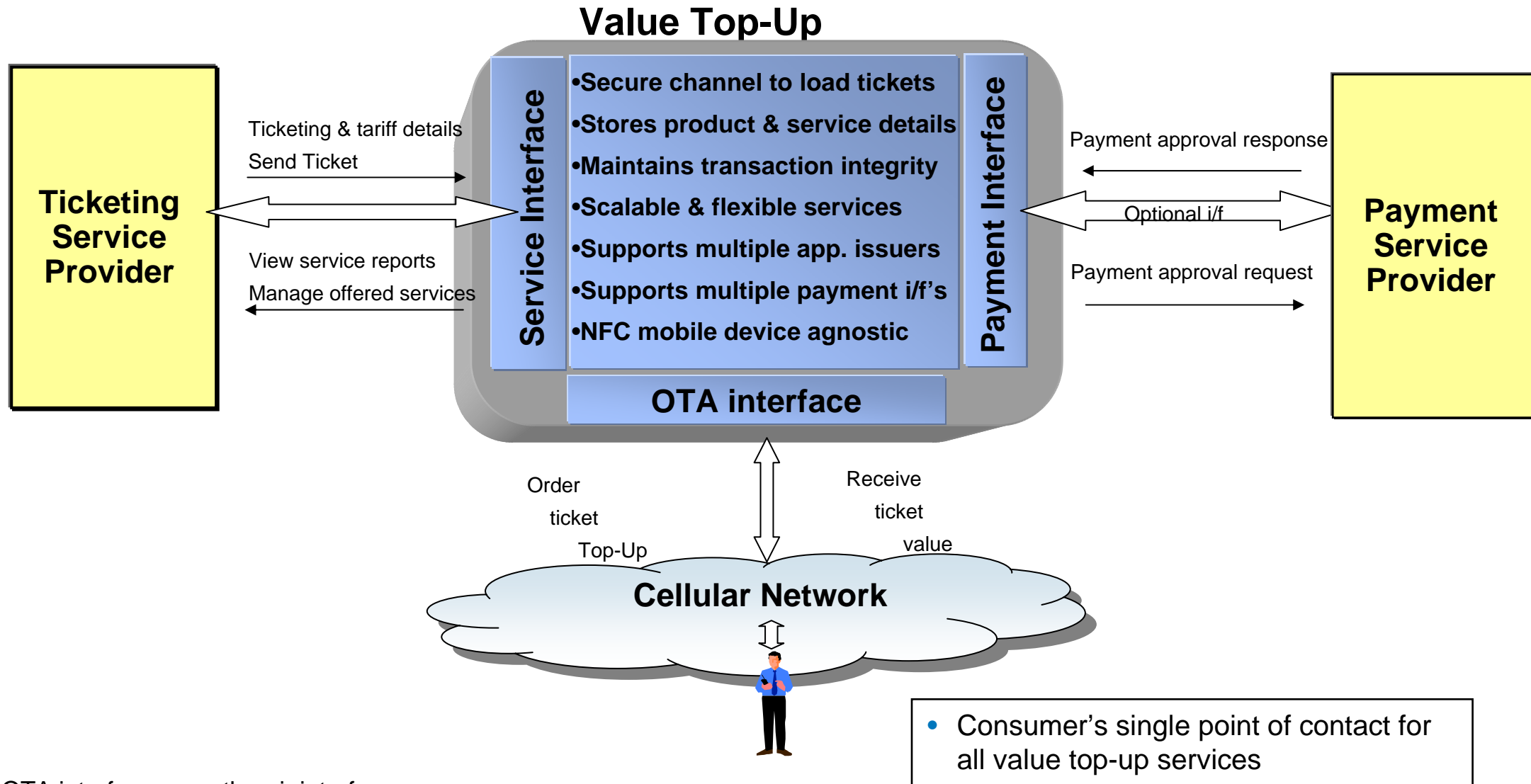
- Over-The-Air management of SE and UI Applications is a must
 - It is simply impossible to have all potential SE and UI applications pre-loaded
 - Security sensitive card holder and application data cannot pre-provisioned
- OTA management includes
 - SE application download
 - SE application personalization
 - SE application life-cycle management
 - UI application download
 - Distribution of new UI application versions
 - Additional services, such as "info service", "stop service", "re-issuance service" etc.

4. Venyon Top-up-Service

Venyon Top-up-Service for different applications

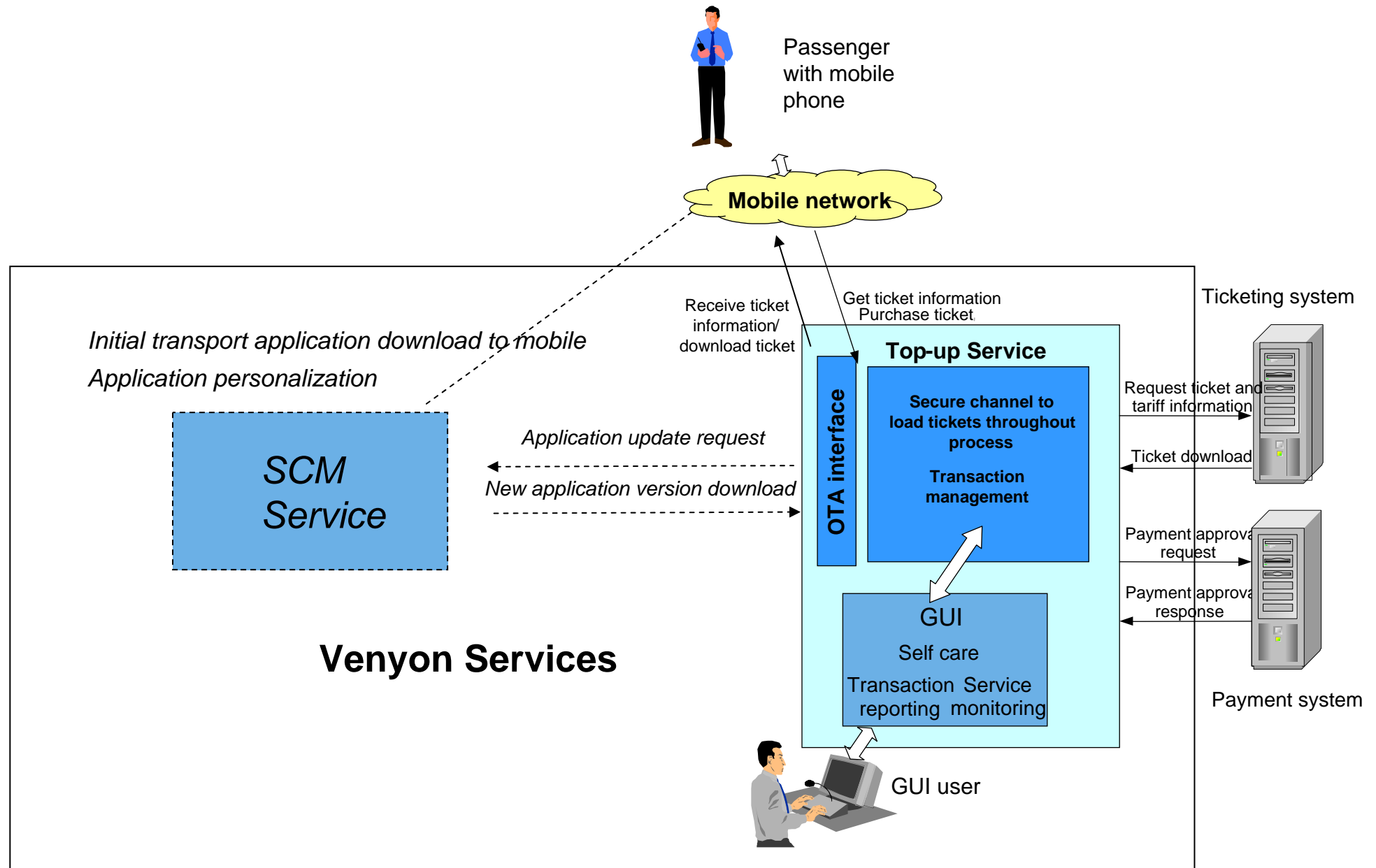
- Several applications and use cases requires or may require value top-up functionality
 - Public transportation ticketing
 - Stored value applications such as e-purse
 - Gift cards
 - Event ticketing
 - Loyalty
- Venyon Top-up-Service enables to transmit this value to NFC enabled handsets and applications securely over-the-air
- Venyon offers compliance with different handset types including scalability
- Benefits all parties
 - Reduces e.g. cost of ticket issuance
 - Reduces cash handling through online payment
 - Top-up on demand, anytime, anywhere
 - Easy viewing of available tickets/value

Features for Top-Up Service



* OTA interface: over-the-air interface

Top-Up service solution with Secure Chip Management



Venyon's value proposition

Cost efficiency

Mobile operators, banks, transport operators and other stakeholders avoid the upfront investment while still being able to migrate to NFC

Less fragmentation

A single point of contact between stakeholders prevents fragmentation of OTA solutions and improves efficiency

Competence & global presence

Proven track record in OTA services and strong expertise in smart card, payment and mobile technologies combined with global reach

Neutrality & openness

Neutral party with white-label business model; open to all mobile operators, service providers, handset and smart card vendors

Time to market

Extensive experience on OTA services in NFC and fully operational service platform available now

THANK YOU!

Happy to answer to any questions:

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