

Capturing Business Opportunity during the new dawn of NFC

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Customer Application Engineering Manager

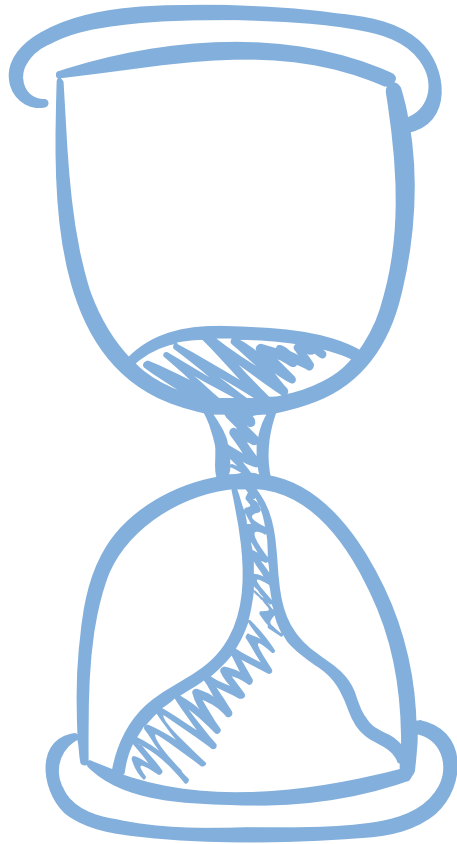
Silicon Craft Technology PLC

June 29, 2021

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Agenda



01

Company Overview

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Rising of Business Opportunity in NFC applications

- NFC web authentication Tag IC
 - Anti-counterfeiting
 - Proof-of-presence
 - Value Chain of NFC web authentication
-

03

Conclusion

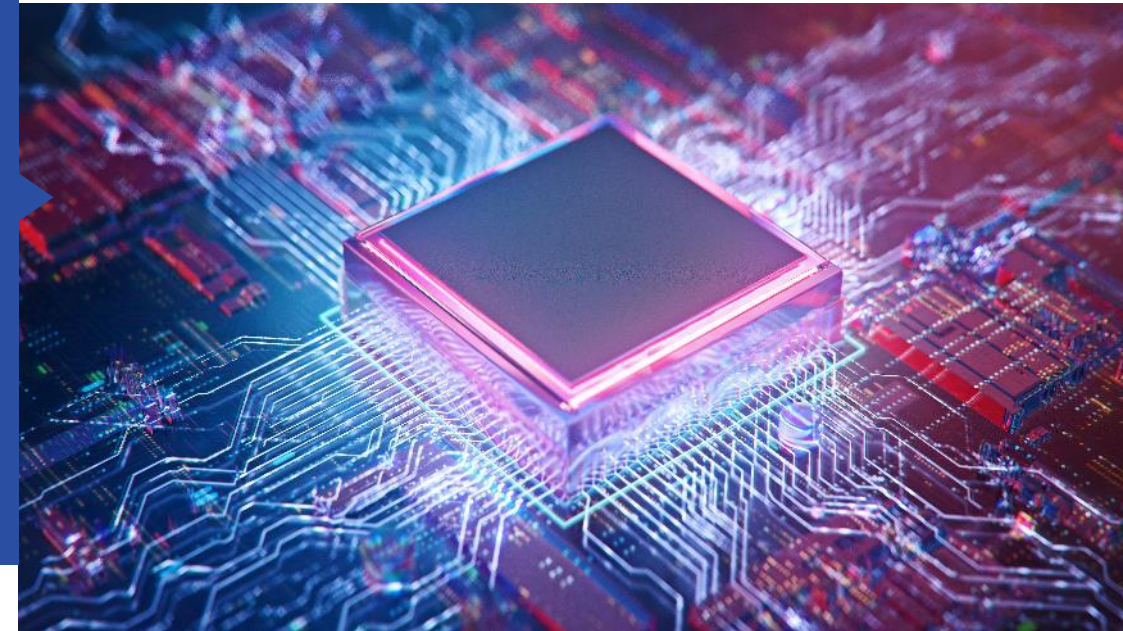
Company Overview



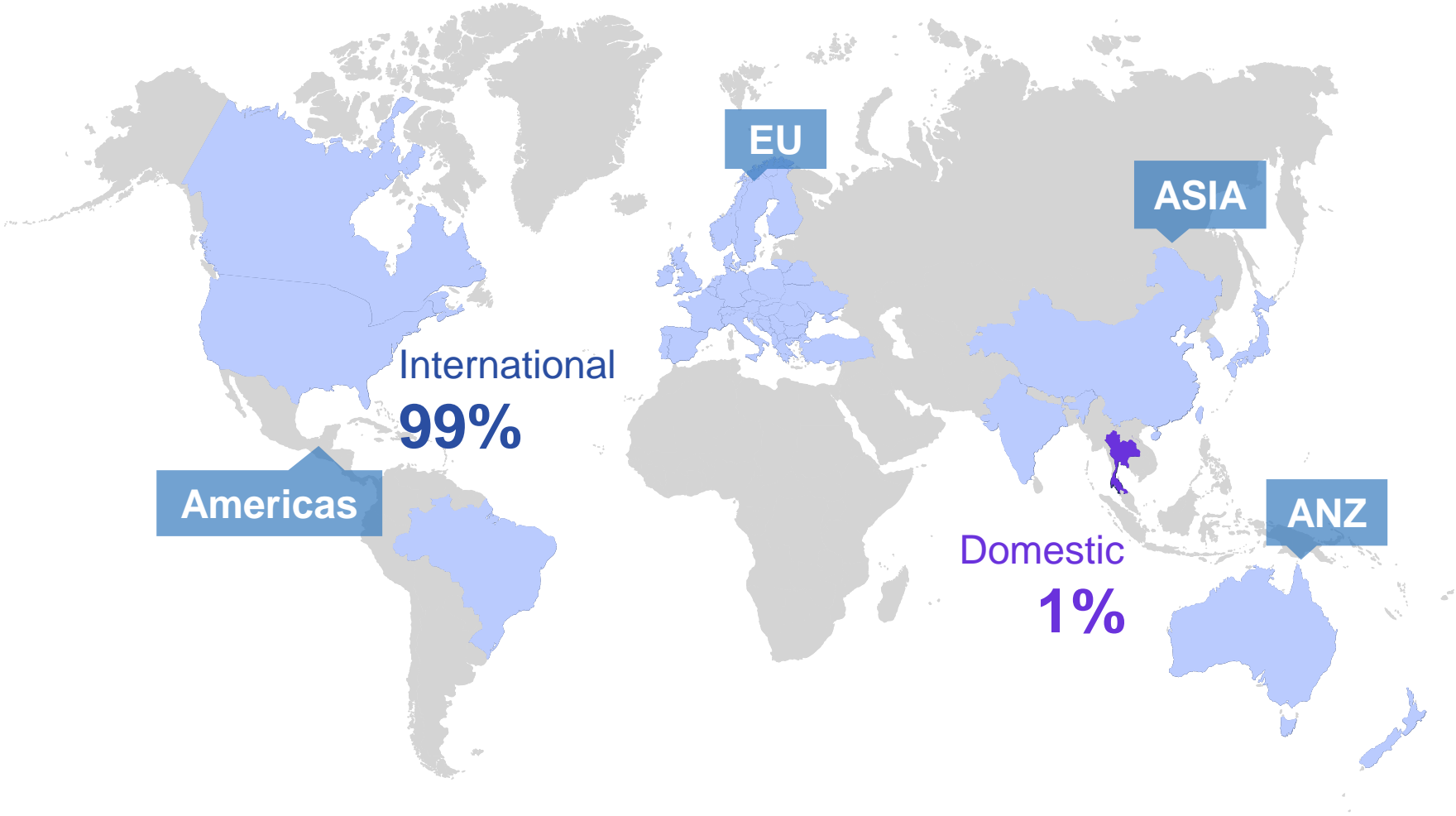
World's Leader and Provider of Innovative RFID and NFC IC Solutions

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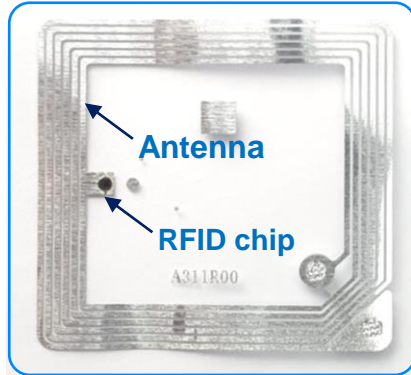
Silicon Craft Technology PLC (SIC) is a world-class fabless semiconductor design company of linear and mixed-signal integrated circuits. SIC offers novel, custom, and standard design microchips for RFID applications and delivering products that carry high value-added features and superior overall systems performance.



Market Coverage



What is RFID?



Radio Frequency Identification

- Use radio wave to enable identification wirelessly
- Chip + Antenna + optional capabilities (memory, sensors, etc.)
- Additional features offered, i.e. Security
- NFC is under HF category



LF RFID

125 – 134 kHz



HF RFID

13.56 MHz



UHF RFID

860 – 960 MHz



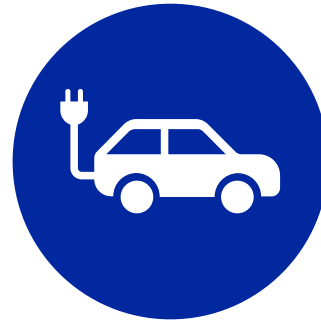
Industries and Applications



IOT DEVICE



LIVESTOCK



AUTOMOTIVE



INDUSTRIAL



ACCESS CONTROL

Rising of Business Opportunity in NFC Applications



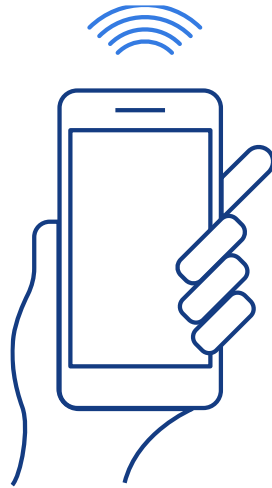
What is NFC?

Near Field Communication

**Intuitive
short-range
wireless
connectivity**



**Readable by
numerous of
mobile devices**



**Convenient
digital content
exchange**



**Compatible with
millions of contactless
cards and readers**



What is NFC?

<https://www.youtube.com/watch?v=8q9ilSSRx7k>



Benefits of NFC



Intuitive

NFC interactions require no more than a simple touch.

Technology-enabling



NFC facilitates fast setup of wireless communication.



Versatile

Suited to the broadest range of industries, environments, and uses

Inherently secure



NFC transmissions are short range.

Open and standards-based

Follow implemented ISO, ECMA, and ETSI standards

Interoperable



NFC works with existing contactless card technologies.

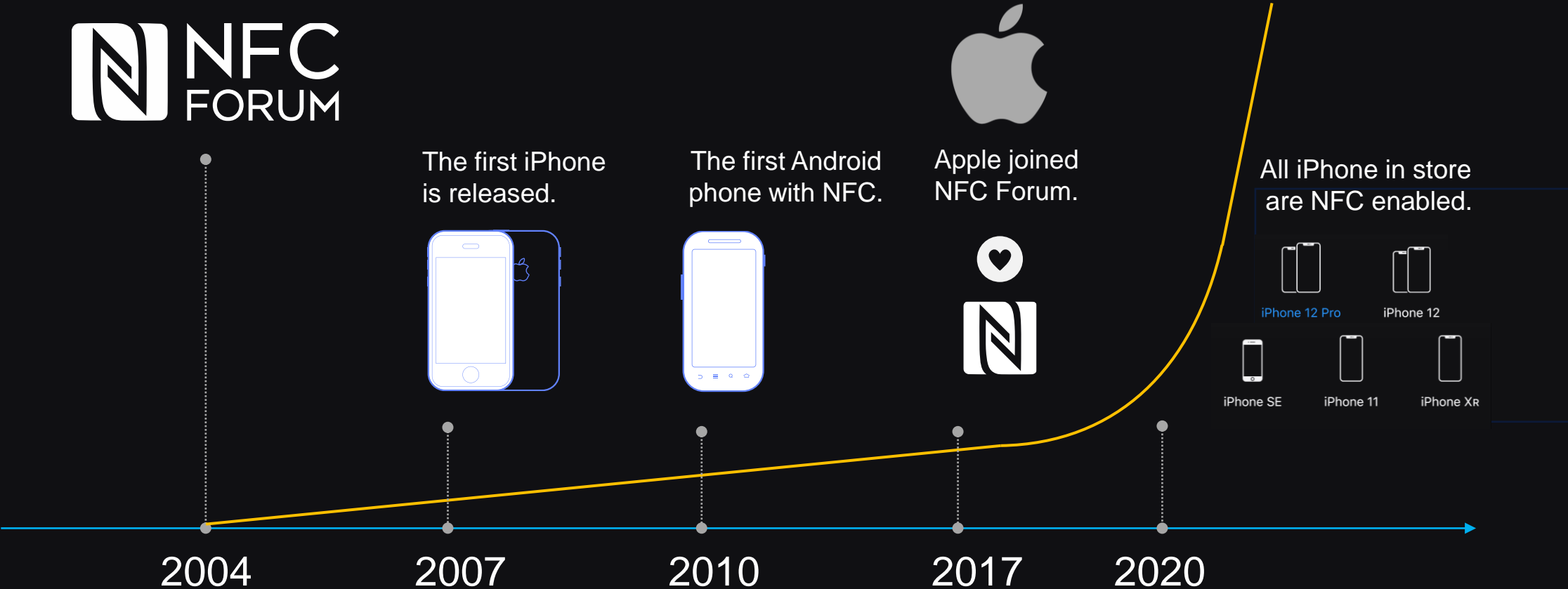
Security-ready



NFC works with existing contactless card technologies.

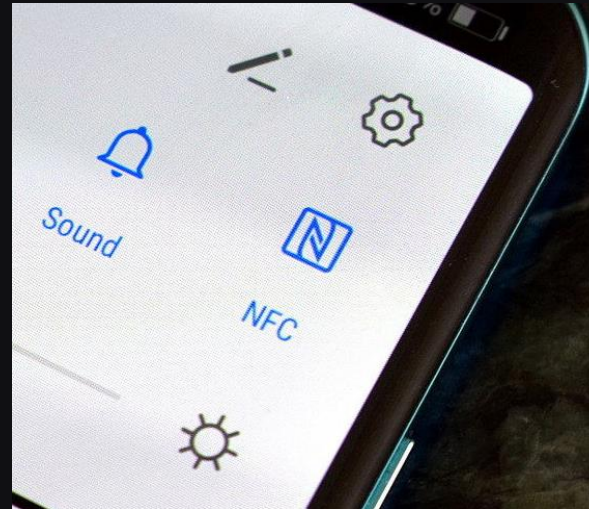
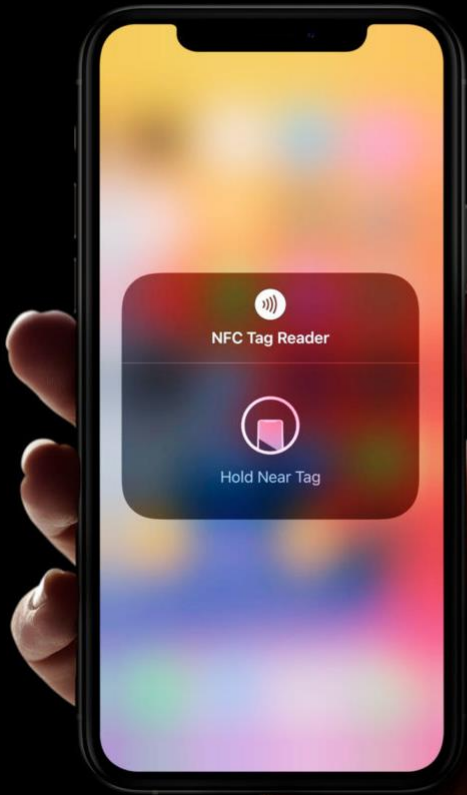


A new dawn of NFC



Major NFC market shift since 2020

100%
of currently selling
iPhone support NFC.



Around 75%*
of currently (2020-2021) selling
Android Phone support NFC.

*For Mid-end to high-end mobile phone
according to GSMarena.com.



**Contactless payment
jump 40% due to** concern of
COVID-19 popularize use of NFC.

Mastercard CEO interview to CNBC on
April 29th,2020.

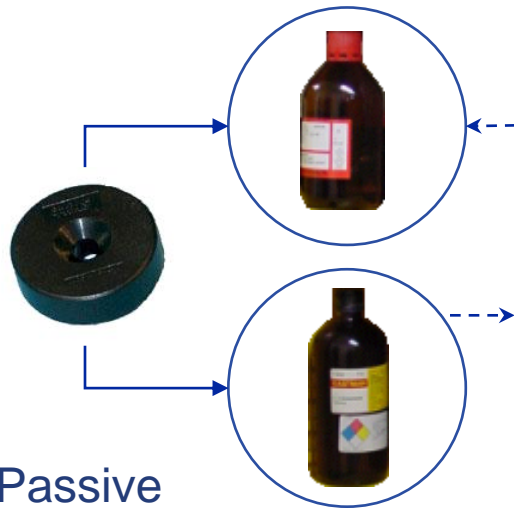


Rising Demand of NFC Tags & Applications

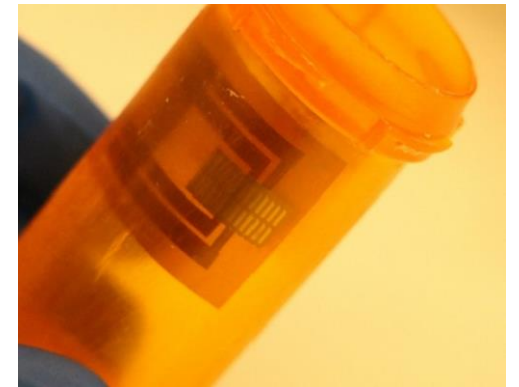
NFC Applications

Making ordinary objects 'Smart' and 'Connected'

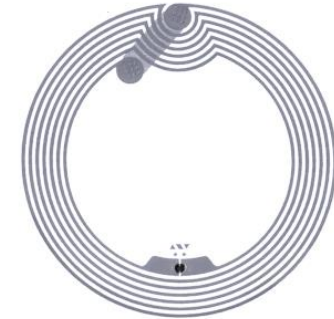
by NFC Web Authentication



Passive
read/write tags
affixed to caps of
containers

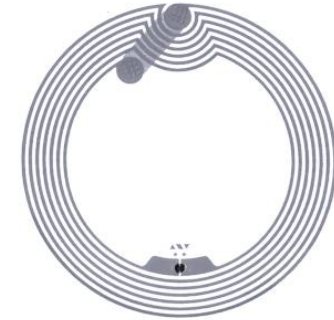


Paper QR vs NFC Tag (1/2)



	QR code	NFC Tag
Intuitive	Yes	Yes
Cost	Very low	Low
Consumer Adoption	Mature	Increasing
Communication Range	Visibility Dependent	Near
Cloning	Easy to clone	Very difficult to clone
Data Content	Static	Static or Dynamic

Paper QR vs NFC Tag (2/2)



	QR code	NFC Tag
Security Level	Low	High
Objectives	<ul style="list-style-type: none">• Public content• Location irrelevant• Cheap digital message• Short-life message	<ul style="list-style-type: none">• Private content• Location-based or Object-based• High-value digital message• Long-life message
Applications	<ul style="list-style-type: none">• Bulk promotion or advertisement	<ul style="list-style-type: none">• Web Authentication• Location/Object link applications• Anti-counterfeiting• Loyalty program

Applications for NFC Web Authentication

- Anti-counterfeiting
- Proof-of-Presence



Anti-counterfeiting

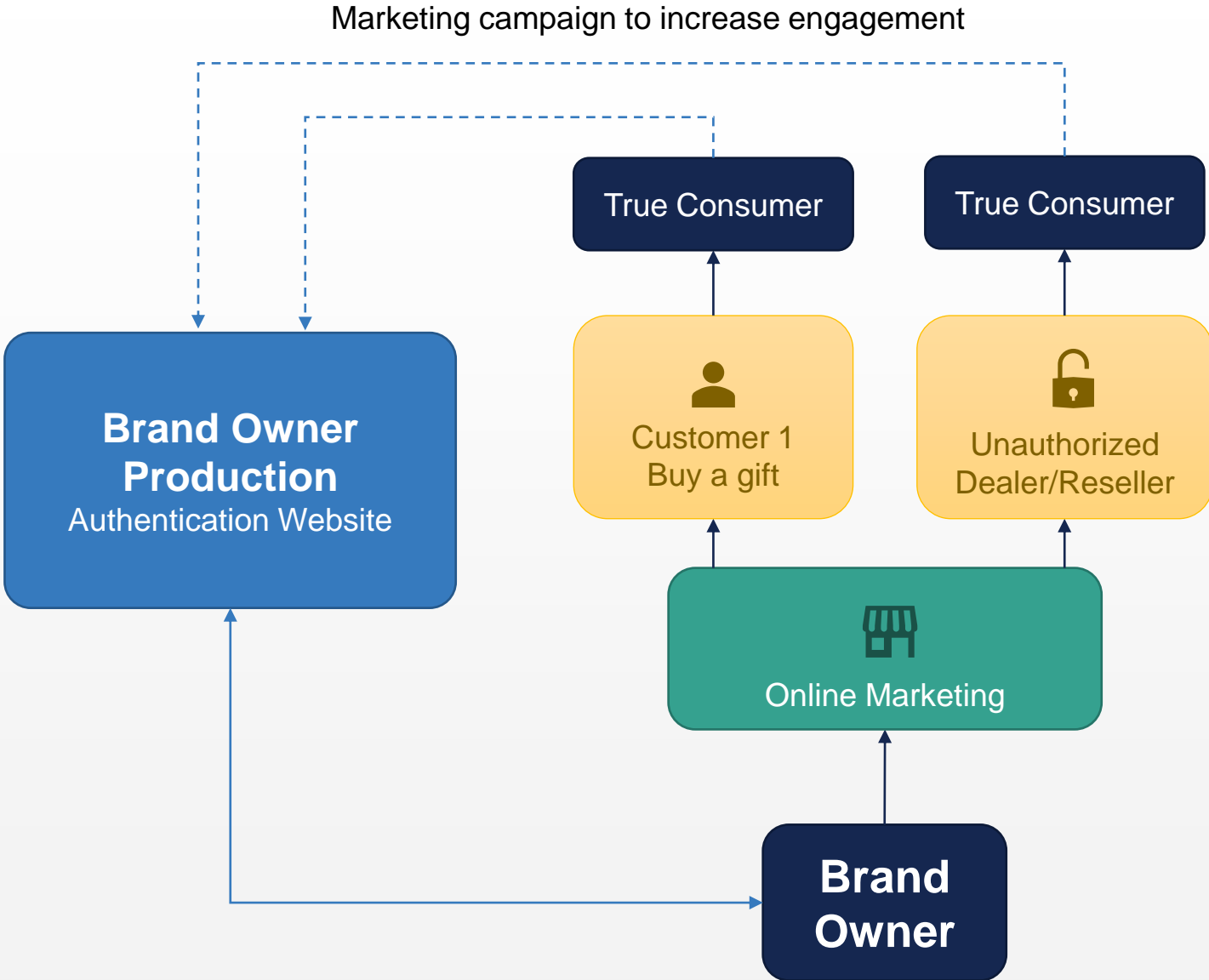


Product Authentication

- Promote confidence and trust
- Enhance customer engagement
- Link product identity to actual customer
- Show product's journey beyond conventional distribution link



Connect to Your True Consumers





Authentication Throughout Product Lifetime

- Product authentication does not end at the first customer
- NFC tag allows product authentication throughout its lifetime
- Customer can trade and transfer goods with confidence
- While maintain price in resell market and increase brand value at the same time

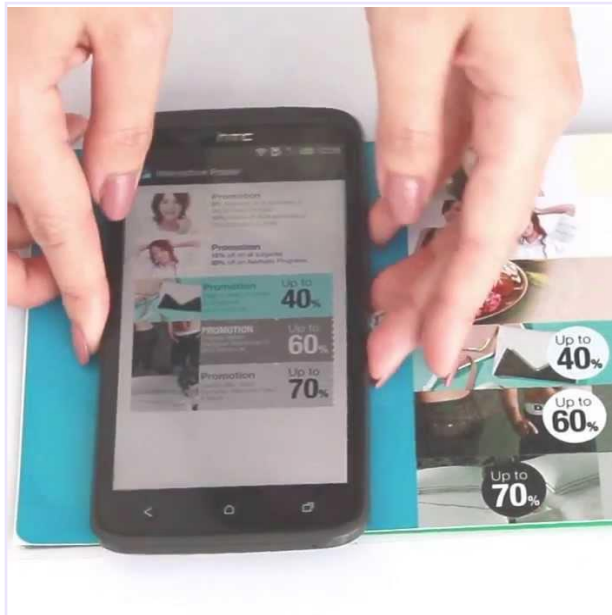
Proof-of-Presence



Proof-of-Presence

Proof of Presence electronically confirms user to gain physical access of data in the tag

Location-based Coupon



Ticket & Wristband



Guard Tour System



Proof-of-Presence – extended use case

Though you are allowed to access the physical area but **frustratingly** trying to gain an access to Wi-Fi



You need to select the right connection from the **lengthy** Wi-Fi network list



Then to fill out the **unreadable** string of passcode



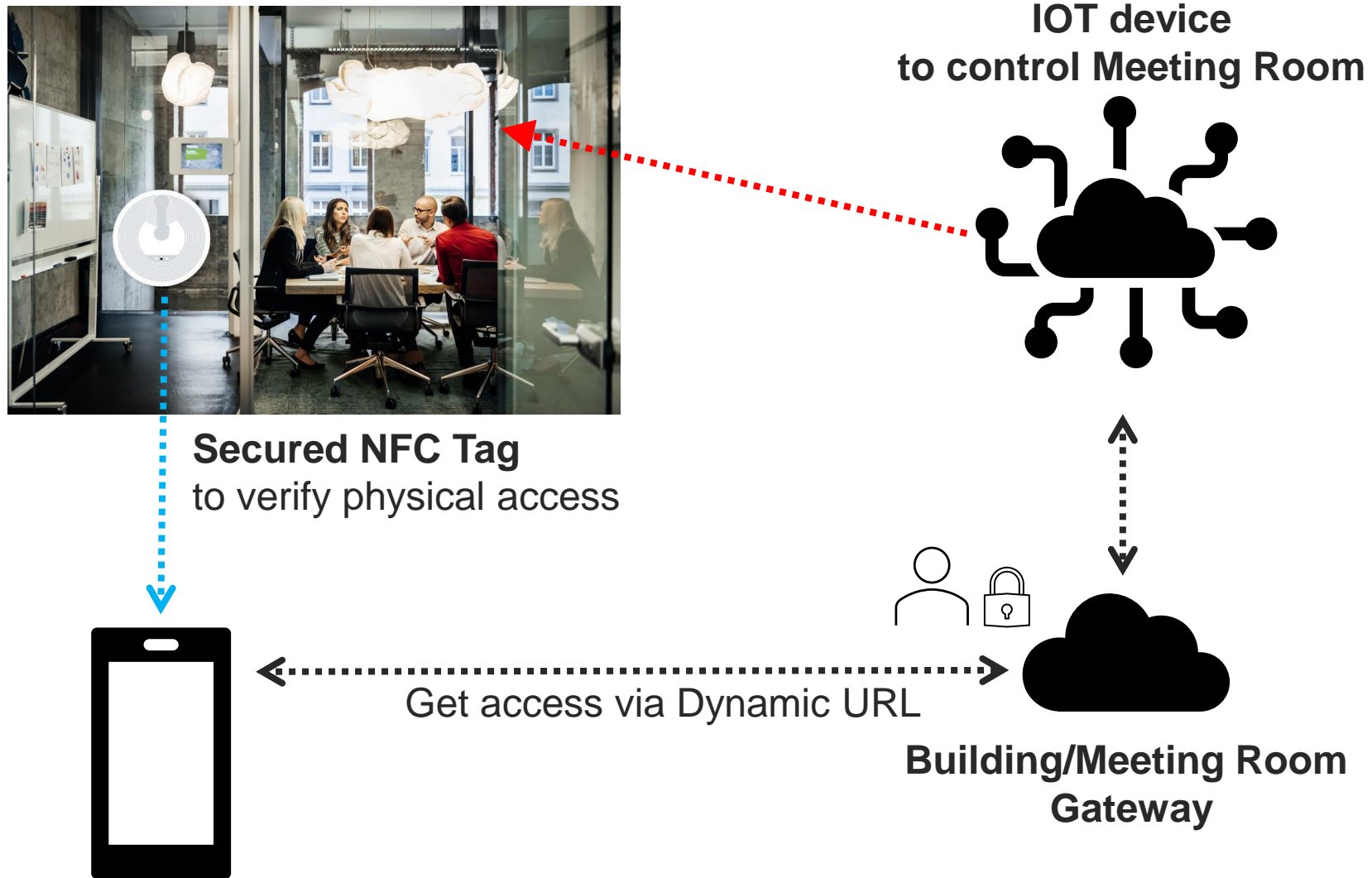
With secured NFC tag, log-in is not required

Tap Here to control the
light and aircon



Tap Here to connect to Wi-Fi

Concept of extended use case for Proof-of-Presence (1)



Concept of extended use case for Proof-of-Presence (2)



Secure NFC Tag
to verify physical
access

**Captive Portal website with
Dynamic URL verification**

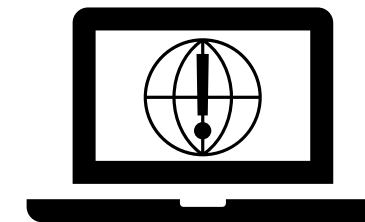


Customized
Wi-Fi Router



Get access via Dynamic URL

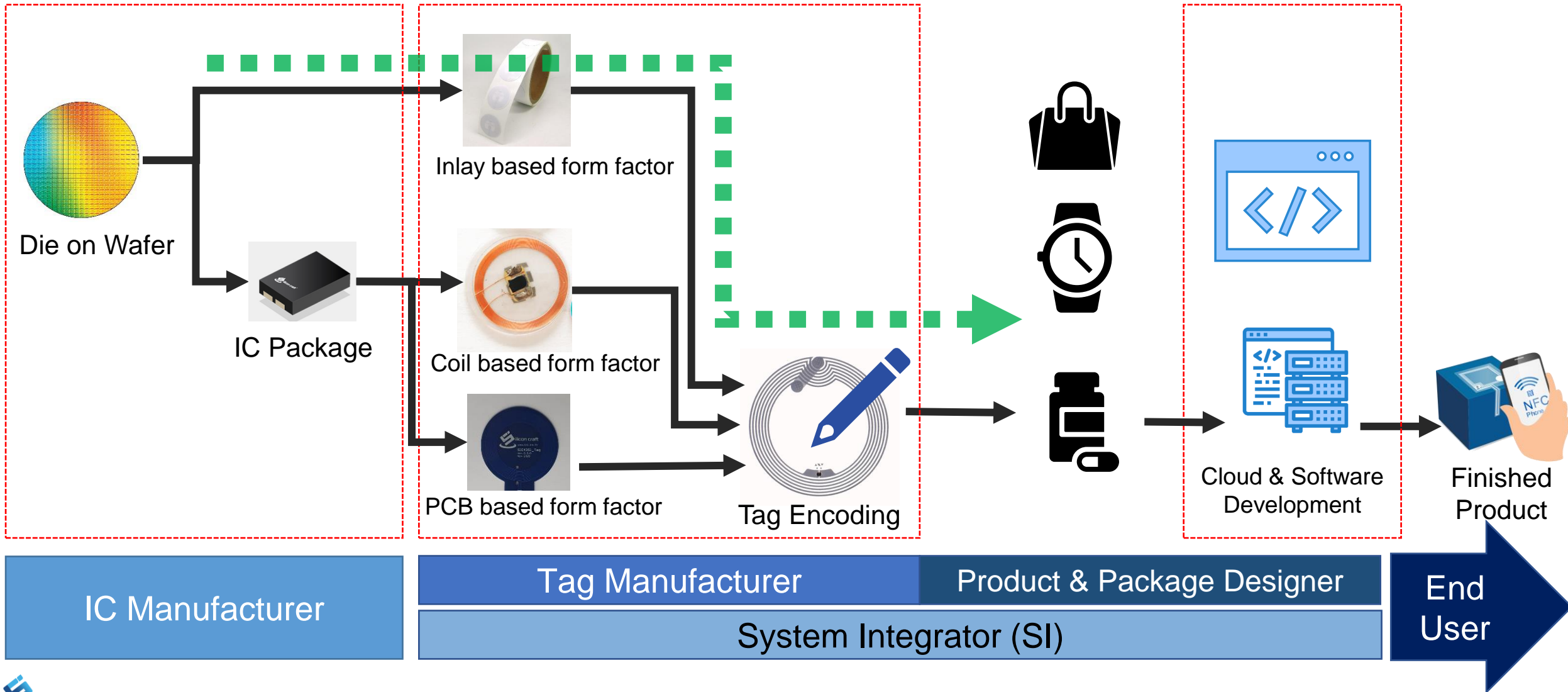
Transfer access via Dynamic URL



Value Chain of NFC Web Authentication

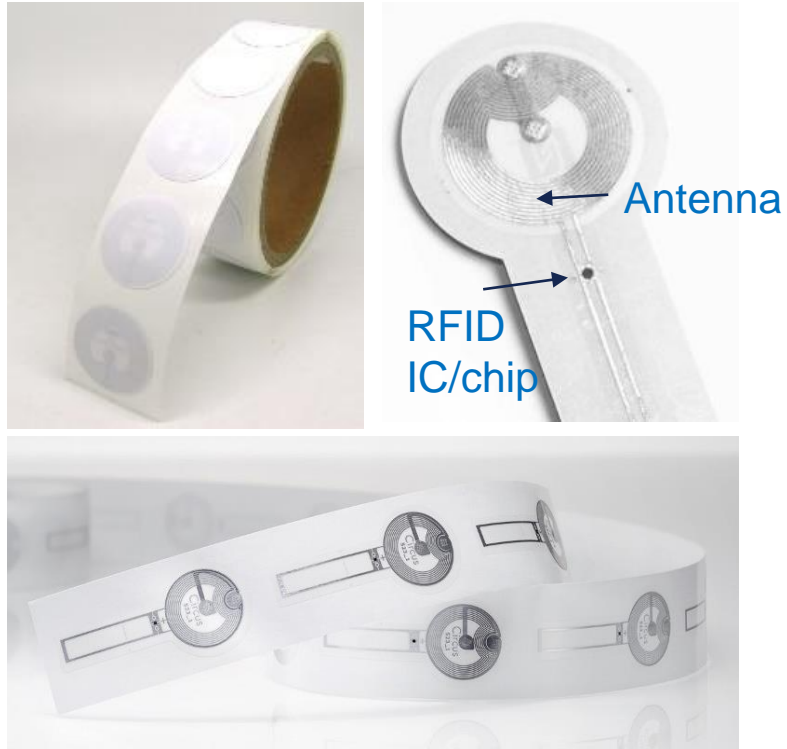


Value Chain of NFC Web Authentication



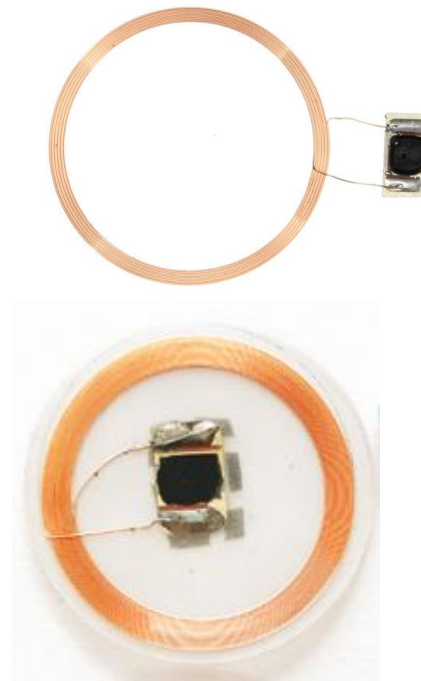
Tag Manufacturer

RFID Inlay based tag



- Cost-effective
- Easily integrated into various products

Coil based tag



- High performance
- Endure harsh manufacturing process

PCB based tag



- Easily integrated into IoT devices

Tag Encoding & Printing

- NFC web authentication needs encoding of confidential data (ex. key & password) unique to tag

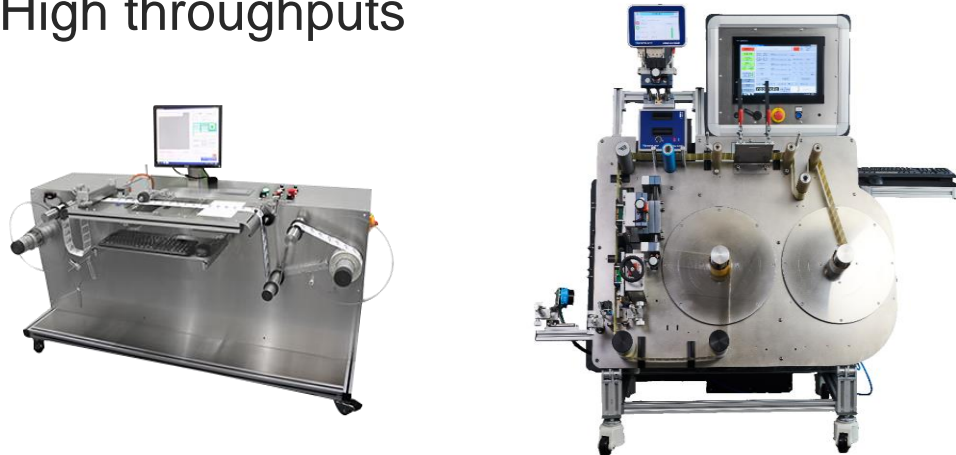
Desktop Label Printer

- Suitable for low volume production (500 – 10,000 pcs/day)



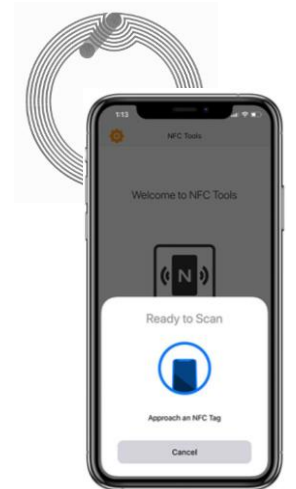
Reel-to-Reel RFID Encoding & Printing

- Suitable for mass production
- High throughputs



Mobile Application

- Suitable for low volume encoding
- App retrieves confidential data from internal and encode into tag on-the-fly

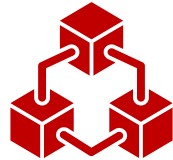


Product Designer Package Designer

- Define the best way to integrate NFC into product or package
- Add value to customer and brand owner
- Drive long lasting customer engagement



Software Developer



- Real-time authentication
- Secured confidential data throughout product lifetime
- Suitable for **web app platform**
- Suitable for **blockchain technology** and concept of **NFT** (Non-fungible-token)



System Integrator (SI)

- Integrate components from whole supply chain, H/W and S/W
- Good understanding of NFC tag function up to web application
- Unify solution to serve various products
- Opportunity to serve customers worldwide



Getting Started with NFC



Samples of NFC Tags (various Tag/IC suppliers)

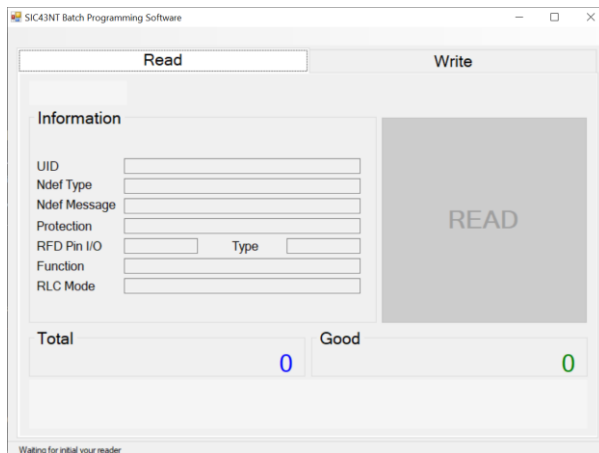


Development Kits and Sample Codes from Suppliers

Mobile App



PC App



Web App Samples

[sic43nt-server-aspnetcore](#)
SIC43NT Tag authenticity verification using rolling code example for ASP.net core
● C# MIT 🍷 3 ☆ 0 ⌚ 1 🛠 0 Updated on Nov 19, 2020

[sic43nt-server-node](#)
SIC43NT Tag authenticity verification using rolling code example for Node.js
● JavaScript MIT 🍷 2 ☆ 1 ⌚ 0 🛠 0 Updated on Dec 23, 2020

[sic43nt-server-pythonflask](#)
JavaScript MIT 🍷 0 ☆ 0 ⌚ 0 🛠 0 Updated on Nov 19, 2020

[sic43s1-server-nodejs](#)
JavaScript 🍷 1 ☆ 2 ⌚ 0 🛠 1 Updated on Dec 23, 2020

[sic43s1-server-netcore](#)
● C# 🍷 0 ☆ 0 ⌚ 0 🛠 0 Updated on Sep 21, 2020

[sic43s1-server-python](#)
SIC43S1 Tag authenticity verification using rolling code example for python
● JavaScript 🍷 1 ☆ 0 ⌚ 0 🛠 0 Updated on Nov 5, 2019

<https://github.com/SiliconCraft>



Conclusion

- NFC technology has started the new traction since 2020
- Web authentication NFC tag is generating a new kind of low-cost passive device with high security
- Beside NFC tags, the solution requires customization and integration in the following areas of expertise
 - Tag manufacturing and Label converting
 - Secured Encoding and Personalization
 - Product & Package design and manufacturing
 - Web app development and System Integration (SI)
- SIC is ready to work with organizations interested in exploring this new frontier together



Q & A



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