A Next-Generation
Authentication in Cybersecurity

SSenStone

SSenStone

Authenticates the world beyond the digital

SSenStone provides authentication technology in cybersecurity to connect organizations and businesses as well as our daily lives simpler, faster, and more secure. SSenStone continues to research and develop technologies that provide safer and more convenient identification and authentication between humans and devices or devices and devices in a rapidly changing information communication technology (ICT) environment. We are driven by one vision: to utilize our authentication technology, One-Time Authentication Code (OTAC) to become the 'oxygen' in the information technology environment over the world.

A Next-Generation Authentication Security Company Selected for the 'K-Baby Unicorn' by the Korean Ministry of SMEs and Startups (MSS)

Provide authentication system including FIDO certified process and RSA based processes. Successful development of OTAC (One-Time Authentication Code) technology allows SSenStone to lead the global authentication market with new methods and products.

Innovation Enabler

Our long-term commitment to innovation provides our customers with unprecedented experiences. We want our customers to deploy authentication technology not only to sell products or services, but to develop entirely new products and services.

Borderless Business

We are not limited to a specific country or continent, but serve as a secure access channel to all products and services around the world. Whether it's a technologically advanced country or a country with insufficient infrastructure, our technology will be present in all products and services that require authentication.

Game Changer

If electricity has become the catalyst for human nighttime activities, our technology will revolutionize fraud-free human-to-human, human-to-object, and object-to-object communication. Our technology advances a new era where people, free from the threat of fraud, can embrace new challenges and explore new opportunities.

SSenStone

Embracing the future in solutions, industries, and infrastructure

SSenStone offers a new approach to overcome the limitations of authentication technology and business facing the market beyond providing standardized technologies in the market for simpler and more secure use based on unique global patents.

190+
Global Patents Application

200+
Global Intellectual Property Right

50+
Global Patents Registration

10+
Successful Investment Attraction

SparkLabs · Hanwha · STIC INVESTMENTS · GEON Investment · SHINHAN · LOTTE VENTURES · KODIT 신용보증기금 KOREA CREDIT GUARANTEE FUND · Idea Bridge · KOSME 중소벤처기업진흥공단

SSenStone leads the next-generation paradigm of authentication security on the global stage beyond Korea. From pioneering a new realm of authentication security with OTAC to enabling more convenient and faster internationally certified biometric and mobile authentication implementations with swIDch Auth SDK, SSenStone is trailblazing the future of authentication security.

Domestic Achievements

- Selected for the 'K-Baby Unicorn' by the Korean Ministry of SMEs and Startups (MSS)
- Received a Prime Minister citation in Korea
- Selected as the national representative of innovative company by Ministry of SMEs and Startups
- Awarded e-Government competition
- Awarded Excellence Prize at SW competitiveness competition of MSIT
- Selected for K-Global 300 of ICT promising companies

Global Achievements

- Winner of CyberSecurity BreakThrough Award (2020 & 2021)
- Cybertech category winner of EUROPAS 2020 Awards
- Finalist of Cybertech 100 List (2020 & 2021)
- Selected as TOP 3 finalist in PITCH competition at Web Summit 2020
- Selected for Accenture Innovation Fintech Lab
- Selected for XTC (Extreme Tech Challenge) Finalist

Verification on Functions

- FIDO 1.0/FIDO 2 Certified
- Obtained level 1 GS (Good Software) certification
- Financial Supervisory Service Security test PASS
- Penetration Testing PASS
- TTA Test result PASS
- The University of Surrey's academic verification for OTAC algorithm and application solutions
- Korea University's study on OTAC

OTAC (One-Time Authentication Code)

A new paradigm for user-to-device identification and authentication

SSenStone's OTAC technology, world's first one-way dynamic authentication technology, provides secure authentication of all digital IDs even in off-the-networks. By implementing a new authentication method that has never been seen before, SSenStone presents a new standard of authentication in cybersecurity that goes beyond the limitations of existing authentication methods.

What we face

A cyber-attack takes place somewhere around the world once every 39 seconds. As a result, there were 8 billion pieces of sensitive personal information being leaked to the market in 2019. These all cost the global economy a staggering $2.9M every minute in 2020.

Risk of static information

Card number, username and password, and PIN number are the most common static information that we use for authentication in our daily lives. The knowledge based authentication (KBA), is not only a big headache for users, but also requires a lot of costs for maintenance. Above all, as the world becomes networked, using a static information in the authentication process can lead to cybercriminals such as identity theft, card not present (CNP) fraud, and hijacking..

Complex authentication process

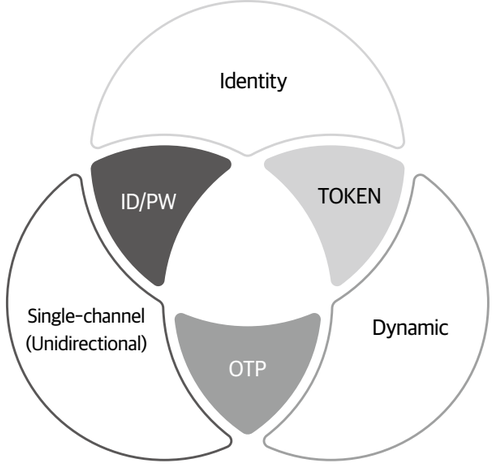
The one-time password (OTP), one of the most common user authentications, cannot authenticate users without the first authentication - usually a username and password. After all, users are bound to feel complicated because they must go through one or more authentication steps before OTP.

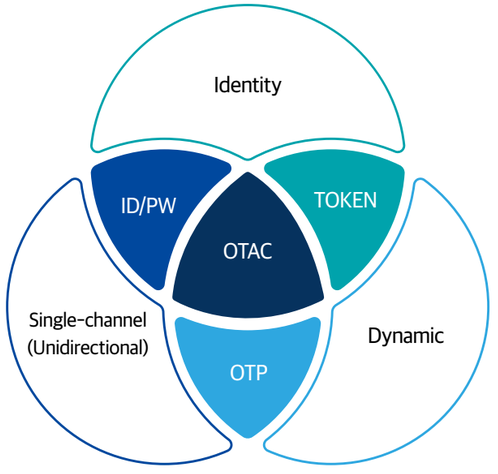
Network connection distress

The process of finding cellular signals for authentication can be very stressful in a place where the communication networks don't work properly. The tokenisation is a method of secure authentication or transaction by obtaining access rights by comparing the authentication key generated by the token service provider (TSP) at a specific point in time. The tokenisation works only in service areas by communication networks and in the controlled environment by the central server.

What we offer

SSenStone's OTAC technology combines advantages of the three most common authentication systems - user ID/passwords, RSA hardware/software for generating authentication codes, and tokenization. It provides more efficient and more effective solutions than any of those elements individually. It generates a single dynamic code that both identifies and authenticates the user at the same time and can do so without a network connection. It is a single-use, time-based, and unique code, so it can't be reused or used by someone else.





Limitations of Existing Authentication Methods

- Vulnerable to leakage/exposure by Static value
- User authentication is impossible with OTP only
- Communication required between User and server (Pull & Push)

One-way Dynamic Unique Identification Authentication Code

- **No need to communicate with Server**
- **Real-Time changes every time for Secure authentication**
- **Non-reusable One-Time Authentication**

Why OTAC

Proposing a new paradigm of identification and authentication between users and devices, OTAC transcends the limitations of existing authentication technology and provides a whole new authentication experience. Even in an environment with no network connection, we can supply single-use, non-reusable, dynamic codes that can identify and authentication between users and devices.

Technology	Overcoming breach of information and illegal reuse issues	User Identification by code only	Single channel network environment (additional network communication not required)	Chances of duplication with other users 0%
OTAC	✓	✓	✓	✓
ID & Password	X	✓	✓	✓
OTP	✓	X	✓	X
SMS	✓	X	X	X
ARS	✓	X	X	X
Token	✓	✓	X	X
FIDO(Biometric)	△	✓	X	✓

OTAC Solutions

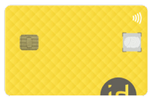
Innovation on the Next-Generation Identification and Authentication in Cybersecurity

SSenStone's OTAC Solutions provides one-way, dynamic user-user, device-device, and user-device identification and authentication in an algorithm as a service (AaaS), supporting the development of innovative products and services embedded with robust authentication security.

Payment Solution

OTAC technology can generate virtual dynamic card information without a network connection, adding an additional layer of security in the payment process. This patented technology is a Card-Not-Present (CNP) security solution that replaces static card information with variable dynamic card information, providing users full control over their security and finances.

Numberless Card



Offline payments

The card functions in exactly the same way as any other cards that we use today do - Chip & PIN or contactless.

Online payments

OTAC integrated banking apps will allow users to be able to generate one-time dynamic card numbers, expiry dates and CVV/CVCs. These dynamic card details can be used in ANY e-commerce payment pages around the world.

Biometric Display Card

SSenStone's Biometric Display Card gets activated with the user's fingerprints only. Once the user scans his or her fingerprint, the display on the card will show a one-time dynamic card number, expiry date and CVV number.

This product is unique. There are cards with the biometric facility, but ours is the only one anywhere in the world that has both the biometric facility and the dynamic number regeneration algorithm built into the card.

Connected Car Solution

With current digital key solutions, linking with car-sharing services to receive keys and start vehicles requires a network connection. Thus, there are potential problems when vehicles are in underground or remote areas with poor access to a network. Using OTAC technology, digital keys can be activated and shared with authorized users without any issues regardless of driver or vehicle location.

IoT Solution

Using dynamic codes, OTAC helps devices easily identify and authenticate users and other devices. When a user generates OTAC on a local device, it can be delivered through various channels such as voice recognition, keypads, and Bluetooth. The OTAC algorithm is small enough to be loaded onto any chip for enhanced security.

M2M Solution

Businesses today are moving towards a microservice environment with reliable end-to-end infrastructure. However, certification processes are as inconvenient as ever because they involve multiple rounds of time-consuming communication. Furthermore, microservices that rely on access control could become overwhelmed by authentication services. OTAC provides one-way identification and authentication between users and devices in end-to-end infrastructure, significantly reducing turnaround time and simplifying the steps involved.

Enterprise Solution

OTAC can log in without any hassle, even in offline environments where it is impossible to connect to a network. Employees can securely access industrial-use applications anytime and anywhere. In an OTAC solution implemented environment, remote work poses no more issues.

ICAM Solution

By assigning users with specific roles and ensuring they have the right level of access to corporate resources and networks, SSenStone provides strong security and improved user experience, and comfort for IT admin and users for mobile and remote working environments.

Military Defense Solution

During a war or battle, it is very difficult to identify and differentiate between allies and targets. At present, we use devices that transmit static information to identify allies. But in cases of hacking, this method poses risks of transmitting intact information to the enemy. OTAC generates dynamic codes on local devices even in offline environments, eliminating the risk of being hacked. Devices with the OTAC algorithm application can transmit dynamic codes that keep changing to safely identify allies wherever they are located.

FIDO (Fast IDentity Online)
The international standard for biometric authentication with proven stability and convenience

FIDO is a next-generation authentication technology of international standards used by global companies including Google, Microsoft, Visa, and Mastercard to minimize security vulnerability and alleviate user-inconvenience caused by ID/password log-in.

What we face

As many organizations start implementing and adopting technology to enable digital transformation, the number of websites and services that require personal information have increased exponentially. However, security in regard to personal information is far from sufficient. Most users still prefer using the same ID and password in traditional ID and password input systems. Once this personal information is leaked, it can be used as a master key login to access multiple websites and services.

To prevent this miserable chain reaction, some websites insist user passwords contain at least one upper and lowercase letter, one special character, one number, etc. Implementing this tactic certainly improves security, but does nothing to alleviate user inconvenience, requiring users to remember and manage complex password combinations

Password leak

Password leakage incidents are a regular occurrence across many industries. Leakage of personal information can be obtained by hackers with ease, resulting in irreparable damage to individuals and service providers.

Password reuse

Users are using the same password for multiple online accounts. It means that users are always vulnerable to account theft and further incidents.

Reset password

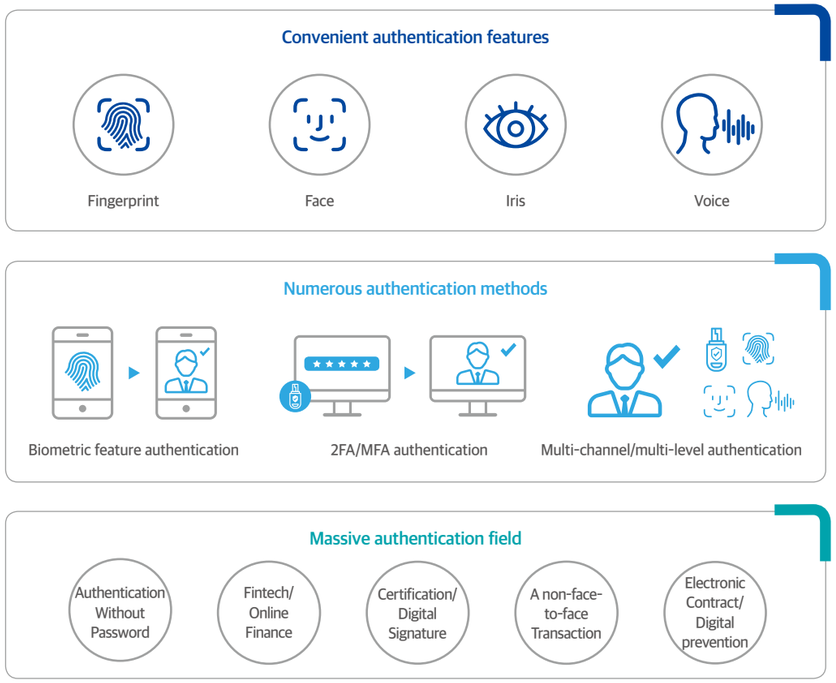
To create a secure password, users adopt difficult passwords which can be easily forgotten. The users' repetitive and unproductive approach to password creation often results in significant opportunity costs.

What we offer

The FIDO technology provided by SSenStone is free from the risk of external leakage because it stores user's biometric information such as fingerprints, faces, and voices in his or her personal mobile device rather than a server. Biometric information is stored in the hardware independently allocated to each user's mobile device such as Trust Zone, USIM chip, IC chip, HSM chip, etc. Since only the authenticated data is transmitted to an external server, users remain at a much-increased level of cyber security.

Privacy enhancement **User experience improvement** **Security enhancement**

FIDO enhances the security and convenience of user authentication through digital signatures using biometrics and simple authentication.



Why SSenStone FIDO

SSenStone is an official member of the FIDO Alliance providing users convenience, accessibility, and stability with strong security based on its own FIDO-certified solution.

FIDO1.0 Universal Authentication Framework(UAF)
- SSenStone FIDO Server v1.0
- SSenStone FIDO Client for iOS(Authentication Combo)
- SSenStone FIDO Client for Android
- SSenStone FIDO Authentication for Android

FIDO2
- SSenStone FIDO2 Server
- SSenStone FIDO2 Authentication

swIDch Auth SDK

All-in-one User Authentication Security SDK

swIDch Auth SDK provides diverse authentication functions including 'FIDO certified' biometric authentication, convenient 'mOTP' (Mobile OTP) and OTAC (the World's First one-way dynamic authentication technology) based 'OTAC Login'.

FIDO	We provide various FIDO certified biometric authentication functions which is much simpler and more secure than the password. We help establish a powerful security environment by utilizing the international standard FIDO technology.
mOTP	We provide a mobile OTP function that works on a smartphone app. With the use of a PIN input, mobile OTP generates a one-time OTP number that provides the same level of powerful security as standard OTP function.
OTAC Login	We provide a login function based on our self-developed, powerful authentication security technology, OTAC (One-Time Authentication Code). OTAC allows users to generate a one-time dynamic code that can identify users even without network connection to the server. By using OTAC based log-in system, users maintain a very powerful authentication security environment.

FIDO

swIDch Auth SDK provides groundbreaking FIDO-based authentication security functions that overcome the vulnerability of ID and password methods. From user biometrics (e.g., fingerprints, facial recognition, etc.), integrative authentication with PIN and pattern input, convenient PC logins with QR codes to electronic signatures, you can expect a secure environment of the highest standard.

Biometrics

Devices capable of recognizing biometrics (e.g., fingerprints, faces, etc.) provide more convenient and quicker authentication.

PIN

Without the need for a complex password, users can verify themselves by setting a 4-digit or 6-digit simple PIN number.

Pattern

On the mobile device screen, users can verify themselves using a registered pattern.

Electronic Signature

Using FIDO transactions, we provide encryption and digital signature PKI functions within the mobile environment such as data integrity encryption/decryption and user and data authenticating electronic signatures. (PKCS #7 standard digital signature)

Private Verification

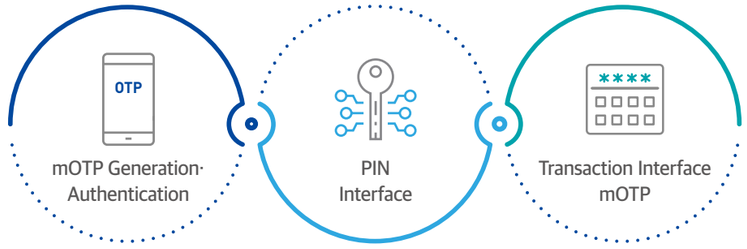
Implementing a private key system based on FIDO authentication technology, we create a PDF digital signature that can be used for electronic contracts and agreements. (PKCS Detached standard digital signature)

PC Login

If generated QR codes from PC log-in screens are scanned using mobile device cameras or the code is inputted, the PC will be logged in.

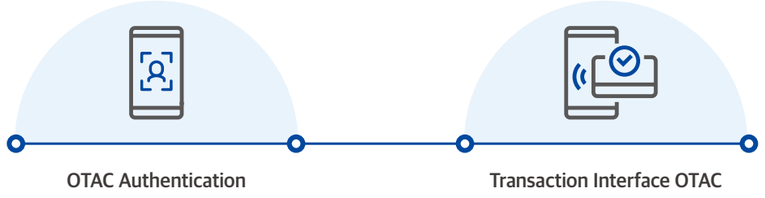
mOTP

swIDch Auth SDK provides easy-to-use mobile OTP function for services requiring higher level secured authentication methods. The mOTP can generate one-time password on mobile app without physical presence of the security card. This helps to prevent lost-card issues and create more convenient usage.



OTAC Login

swIDch Auth SDK provides a newly developed technology, OTAC (One-Time Authentication Code) based login function. OTAC is the World's First one-way dynamic authentication technology and provides the most secured authentication environment. OTAC generates dynamic code that does not allow for duplication or reuse when used for verification without the connection of the networks between device to the server.



SSenStone

Leads the next-generation paradigm of authentication in cybersecurity

swIDch, SSenStone's global business headquarters, is recognized for its technology and growth through its prestigious international awards and diverse accelerator programs. After getting its start through the UK Department of International Trade (DIT)'s GEP program and the UK Committee of Digital, Culture, Media, and Sport (DCMS)'s LORCA program, it has been rapidly expanding its business activities to Europe, the Americas, and Asia.

swidch

swIDch's technologies and business competitiveness have already been sufficiently proven through numerous global awards, competitions and accelerating programs. swIDch is driving the worldwide adoption of software development key (SDK) on authentication in cybersecurity with swIDch Auth SDK while jointly developing various business models with leaders in diverse industries with One-Time Authentication Code (OTAC).

- CyberSecurity Breakthrough Award 2020, 2021
- Hottest Cyber Startup of Europas 2020 Award
- Cybertech 100 2020, 2021
- Cyber@Station F by Thales
- UK FCA (Financial Conduct Authority) Innovation Lab
- Accenture Innovation Fintech Lab
- Finalist of Visa everywere initiative
- LORCA (UK cyber security innovators Program)
- NatWest / RBS accelerating program
- PITCH finalist at Web Summit 2020
- Fintech Development Programme of Plug and Play(Silicon Valley 12 Batch)
- Cyber 101 Accelerator Programme
- Finalist of XTC (Extreme Tech Challenge)

swIDch, Global business headquarter of SSenStone

- Selected for GEP(Global Entrepreneur Programme) in UK
- Selected for LORCA (UK cybersecurity innovators Programme)
- Selected for Cyber 101 Accelerator Programme / UK FCA(Financial Conduct Authority) Innovation Hub

PATENTS, Global Patents and Intellectual Property Right

- Complete the register of Patents and IP in Korea, EU, US, Singapore, China etc.
- Various product development based on the technology and its Patents

5 Global-scale awards winner

10 Acceleration programmes

3 Global technology competition finalist

SSenStone, your Authentication Security Lab,
provides the highest quality of authentication services.

02-569-9668
im@ssenstone.com
www.ssenstone.com
© Copyright SSenStone Inc.