

D.AMO (ALL THAT ENCRYPTION)

Integrated Product Introduction

Nov. 2024

Penta Security Inc.

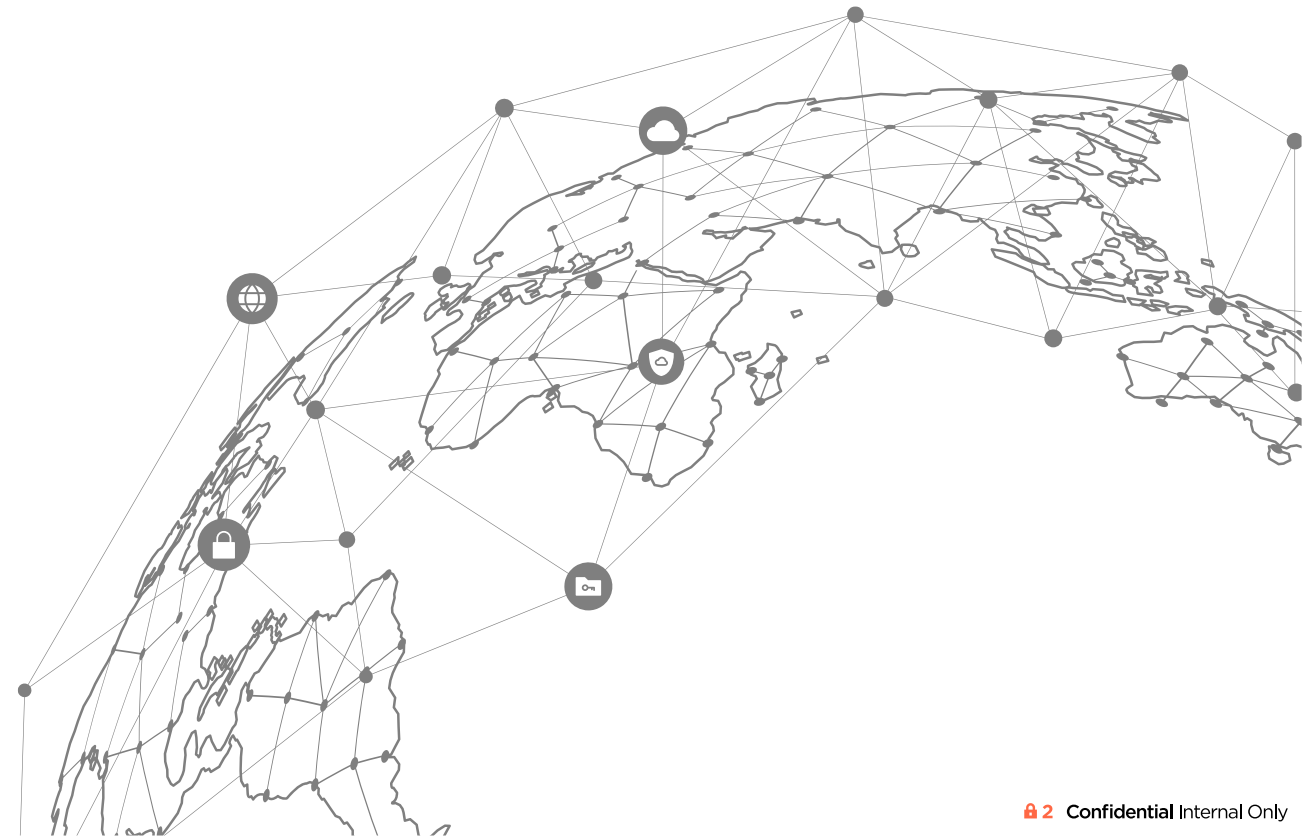


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The Need for Data Encryption

Increased Personal Information Leakage and Damages

With the advancement of Internet technology, the value of personal information is increasing as diverse online services such as mobile, IoT, and connected cars become closer to our lives.

As a result, cases of personal information leakage caused by hackers are constantly increasing, and the amount of damage due to information leakage is also reaching record highs every year.

Personal Information Leakage Cases for 3 Years

Korea Fined KRW 700 million for Breach of 4.87 million Personal

Posted 2023.03.22 6:56 PM · Updated 2023.03.23, 12:15 AM [Original Text](#)

PIPC Imposes Penalty Surcharge of KRW 69.2 billion

Posted 2022.09.14 2:19 PM · Updated 2022.09.14, 2:20 PM [Original Text](#)

Fashion Shopping App, Had 6.6 million Members' Personal Information Stolen

Posted 2021.11.30 6:17 PM [Original Text](#)

'41.2 billion Worth' of Financial/Personal Information Stolen... 1.5TB Capacity

Posted 2020.06.15 6:02 AM [Original Text](#)

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As of Aug. 2023, Over 3 Years

The Number of Personal Information Leaked About **65.05 million**
The Total Fines **KRW 137.67979 billion**

Source) Security News 2023.10.05 Article

Company Damages from Personal Information Leakage

Image Loss



Economic Loss
(Compensation for Damages, Fines, etc.)



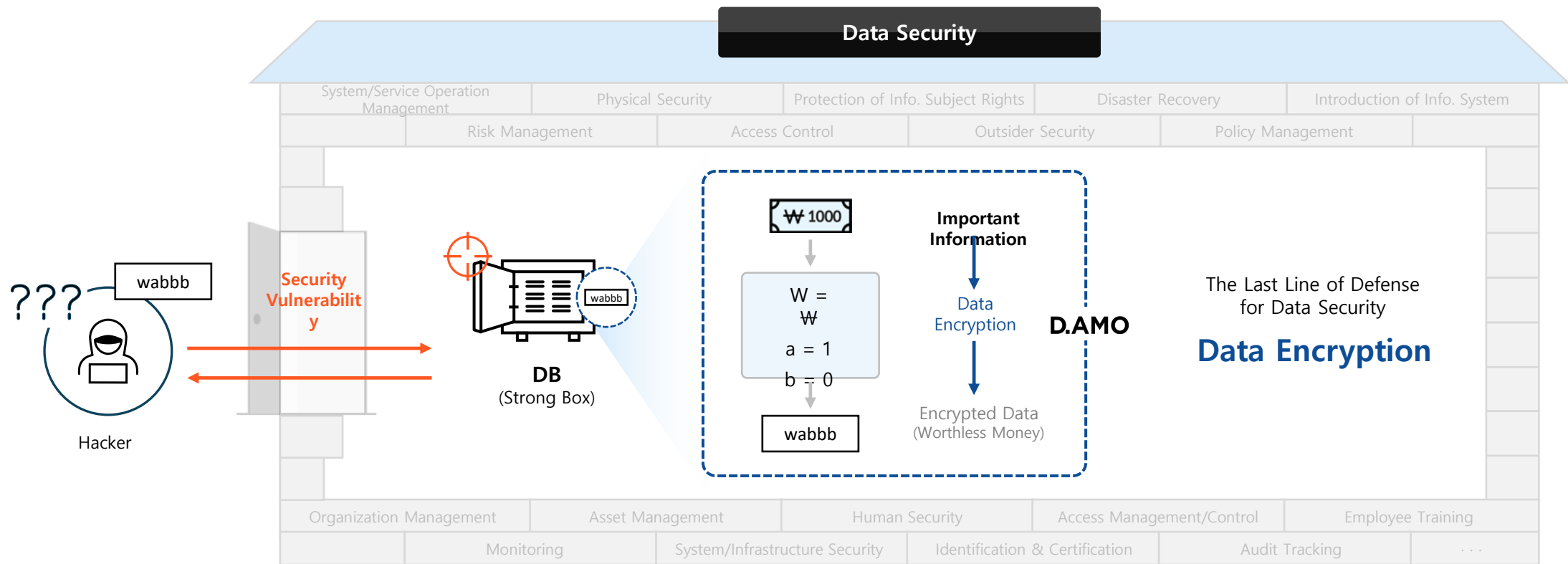
Declined Reliability



Why Is Data Encryption Important?

Among numerous data security measures to minimize damages to personal information, 'data encryption' is the most fundamental and effective solution.

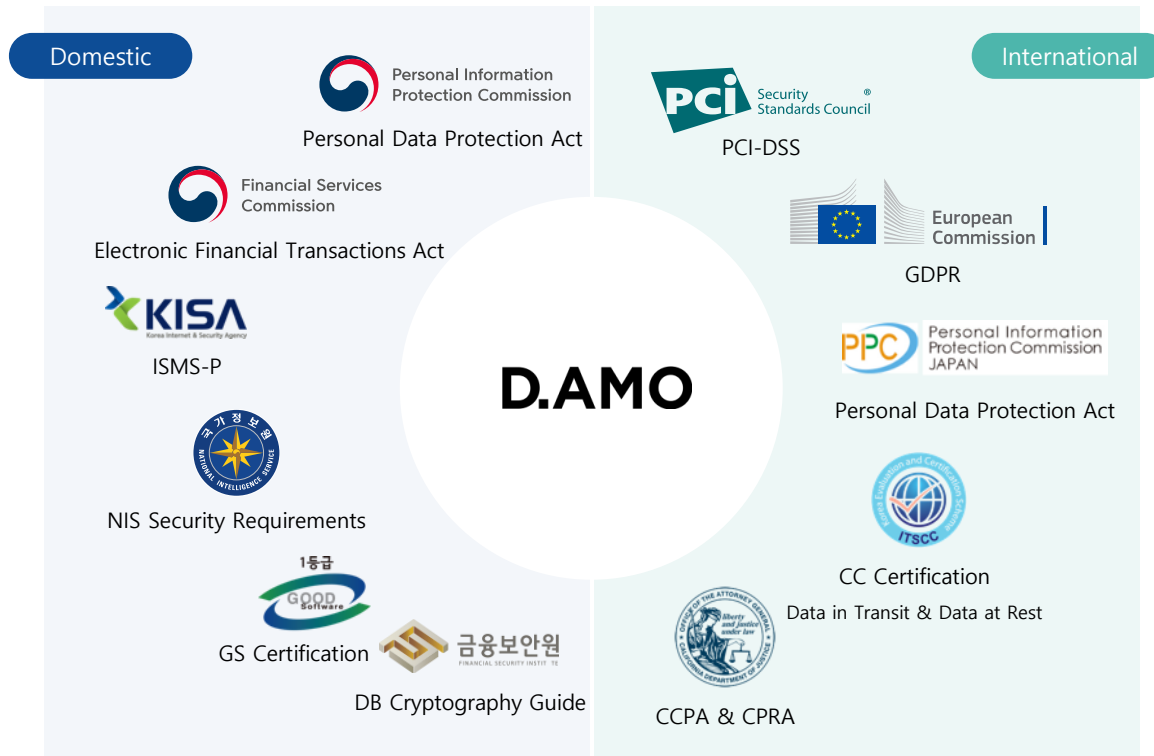
Data encryption is the key and the last line of defense for data security, and encrypted data remains readable nor utilizable by hackers even if data breaches occur.



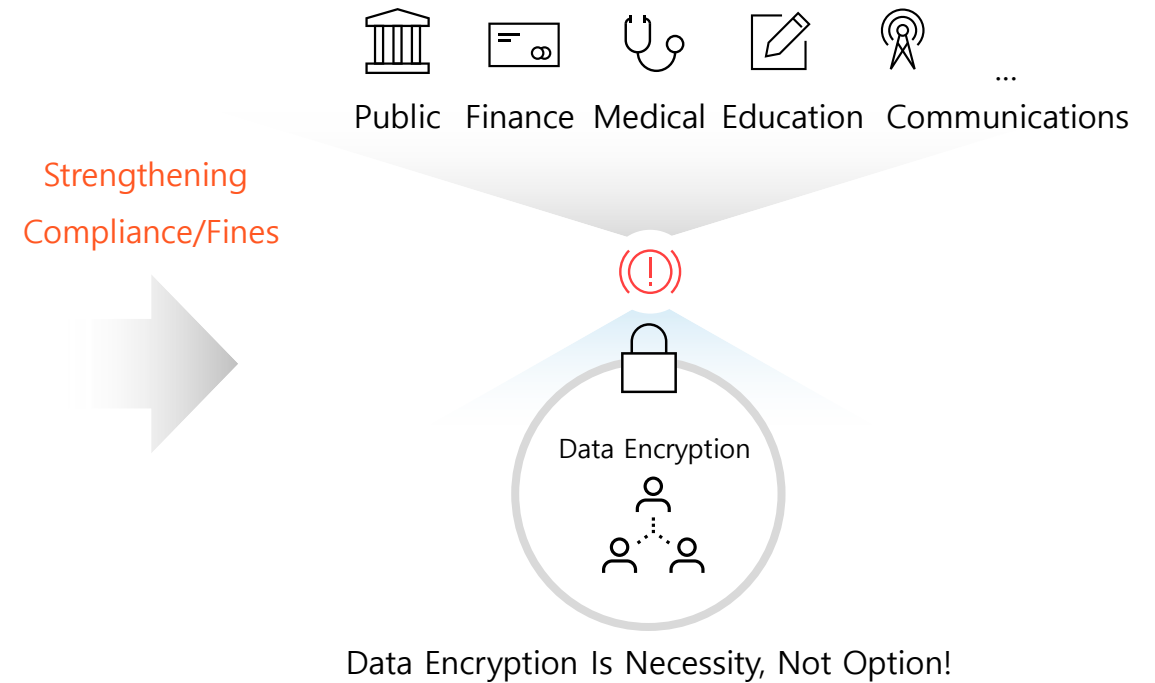
Strengthened Domestic/International Compliance Regarding Data Encryption

As damage from personal information leaks increases, countries are strengthening personal information protection compliance and fines. Data encryption has become an essential element of corporate information security.

Encryption Compliance & Certification



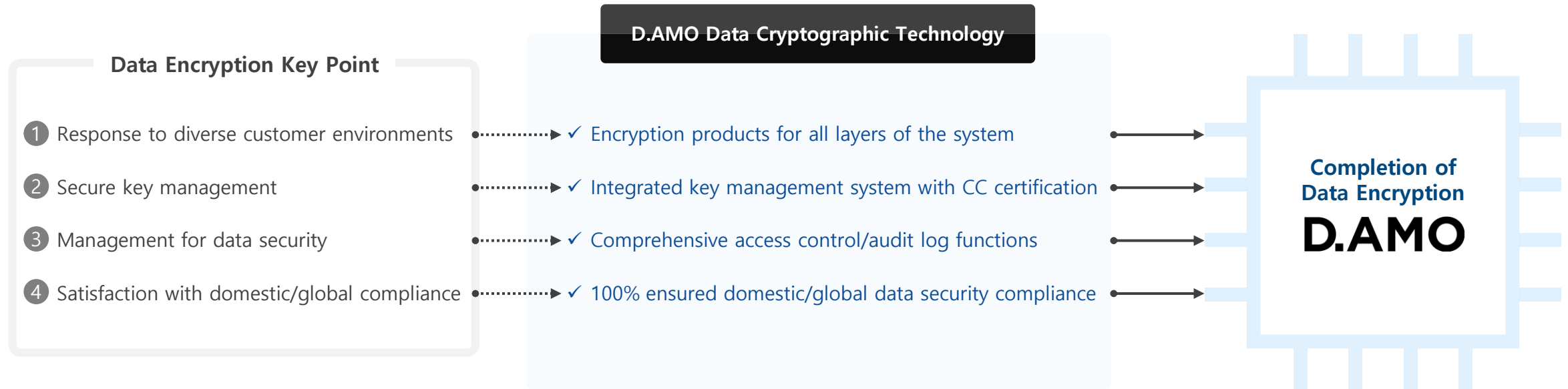
The Growing Importance of Data Encryption



Completion of Data Encryption, D.AMO

Optimized products and a strong key management system, based on various references, are essential to simultaneously meet compliance and security technology requirements regarding data encryption.

With proven technology accumulated over 20 years, D.AMO not only satisfies domestic and international compliance, but also safely protects the company's important information from hackers.

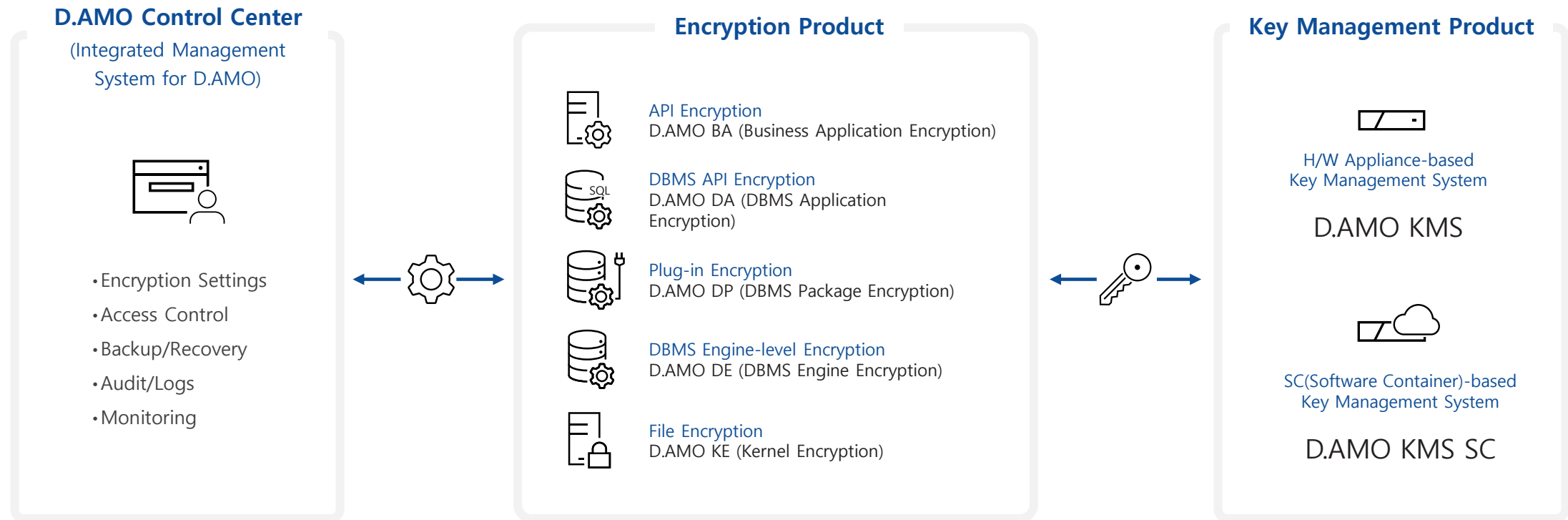


All That Encryption, D.AMO

What Is D.AMO?

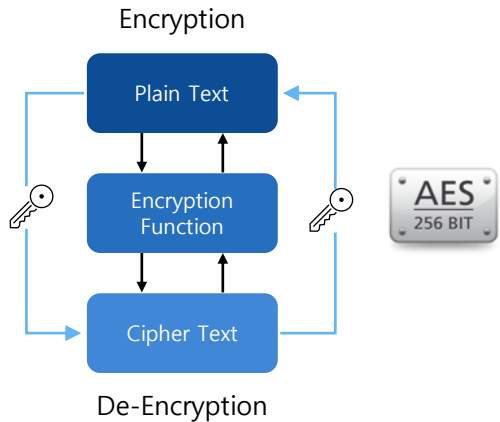
As a Korea's first cryptographic platform, D.AMO provides encryption technology for all layers of the IT system, so that optimized encryption products can be applied to diverse customer environments.

We also provide Korea's first CC-certified key management system and integrated data security functions such as access control, audit, and monitoring to implement safe data security.

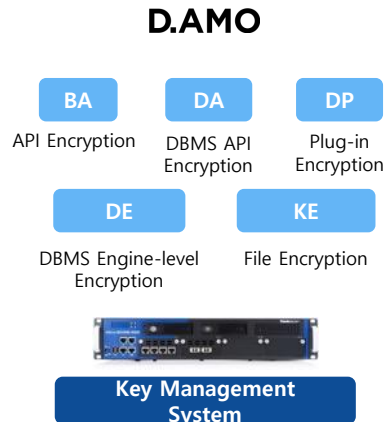


Through continuous encryption development for over 20 years, D.AMO is a cryptographic platform that combines varied systems beyond encryption solutions.

Technology



Product



Solution

D.AMO + POS Terminal

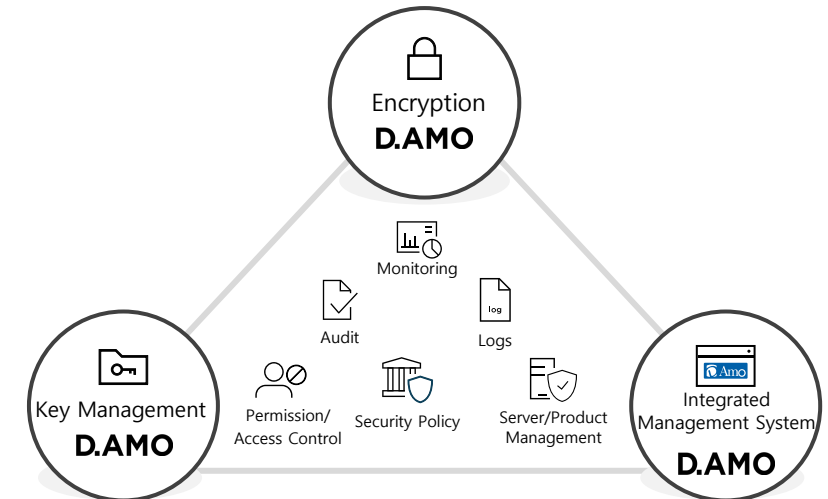
D.AMO + Hospital Management System

D.AMO + Medical Image Solution

D.AMO + Cloud Security Solution

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Platform



- Korea's first encryption technology in 1999

- D.AMO, DB encryption product, released in 2004
- 7 encryption categories & 38 products commercialized
- Encryption optimized for customer environments

- Not a simple solution, but applicable to different customer environments and technology fields

- A cryptographic platform that combines various systems via D.AMO Control Center, which effectively centralizes control of all D.AMO products
- Improved management convenience through key/log management

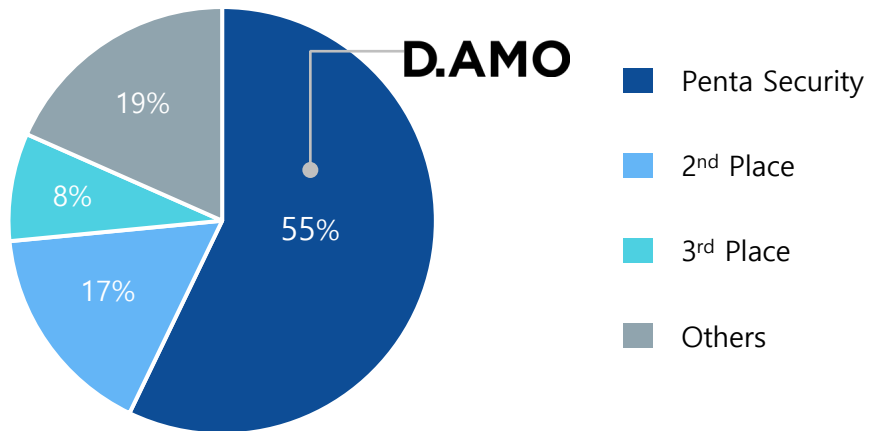
Why D.AMO ?

1. No. 1 in Domestic DB Encryption Market Share

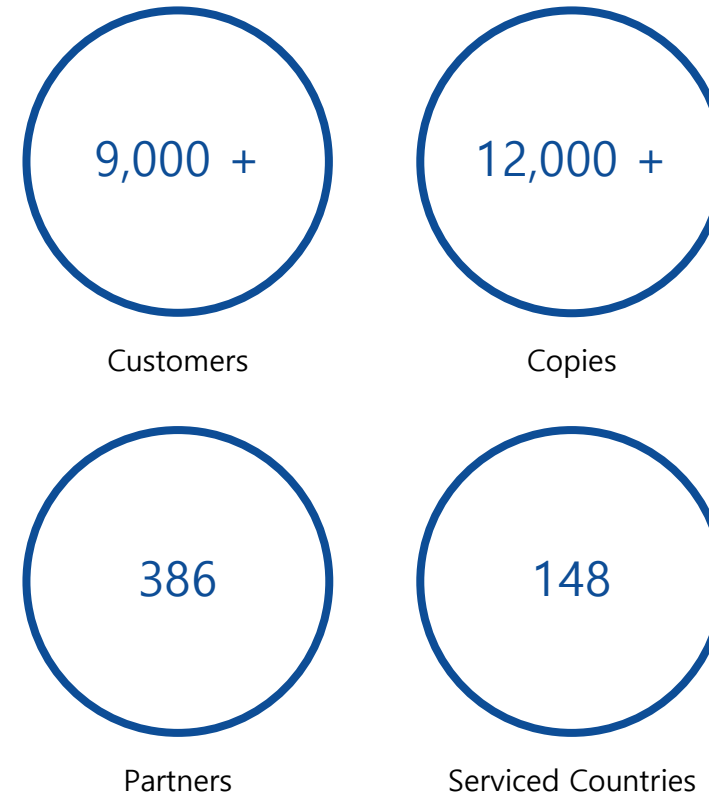
D.AMO is the first cryptographic platform in Korea and has had the largest references over 14,000, including domestic large corporations, financial and public institutions since its release.

DB Encryption Market Ranked 1st in Average Market Share

Korea On-line E-Procurement System, 2006~2023

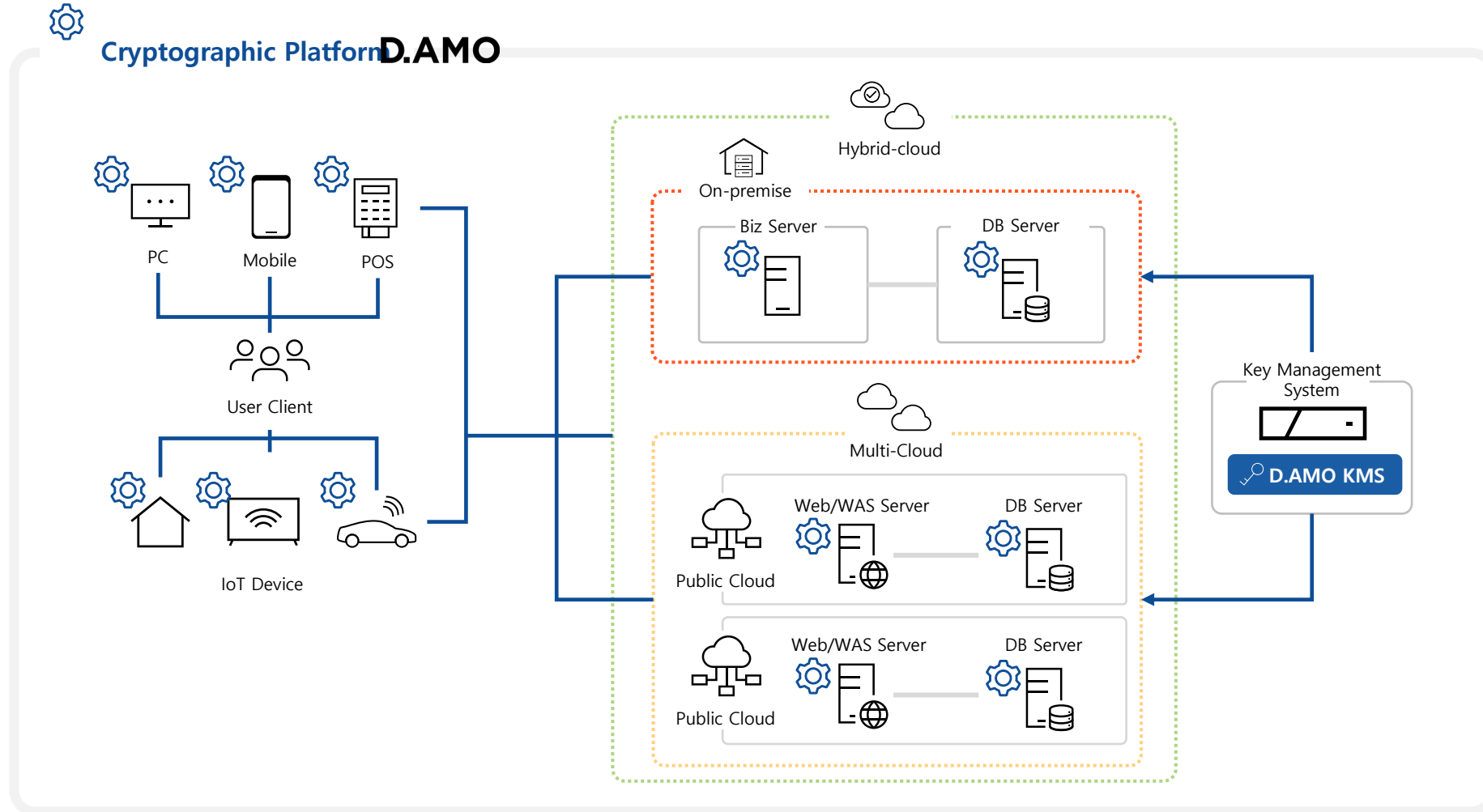


As of Dec.31st.2023



2. Applicable to Various Environments

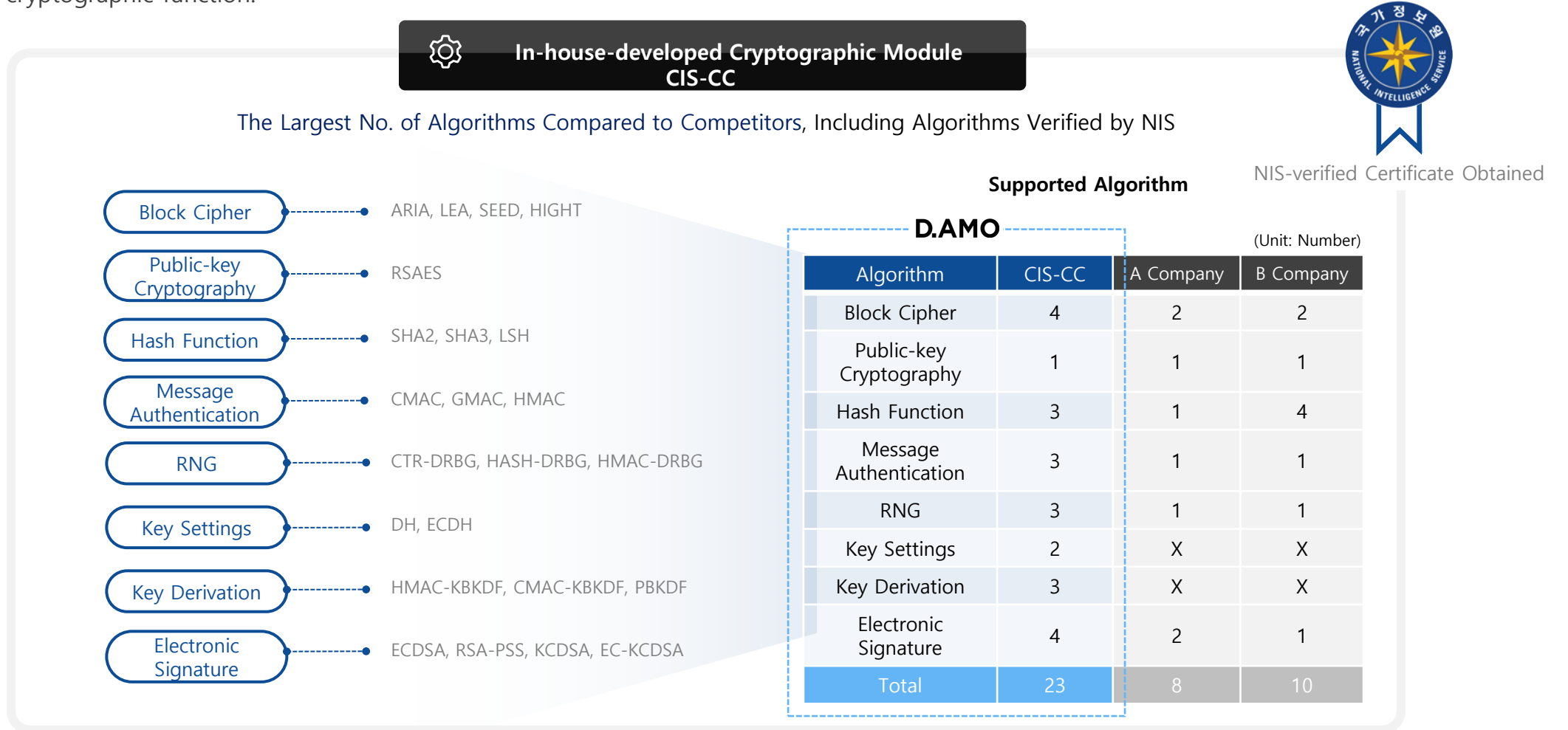
D.AMO implements robust data security in diverse environments such as on-premise, cloud (multi cloud, hybrid cloud), IoT, AWS RDS, POS, and block chain.



3. The Largest Number of Algorithms Supported Through NIS-verified Cryptographic Module

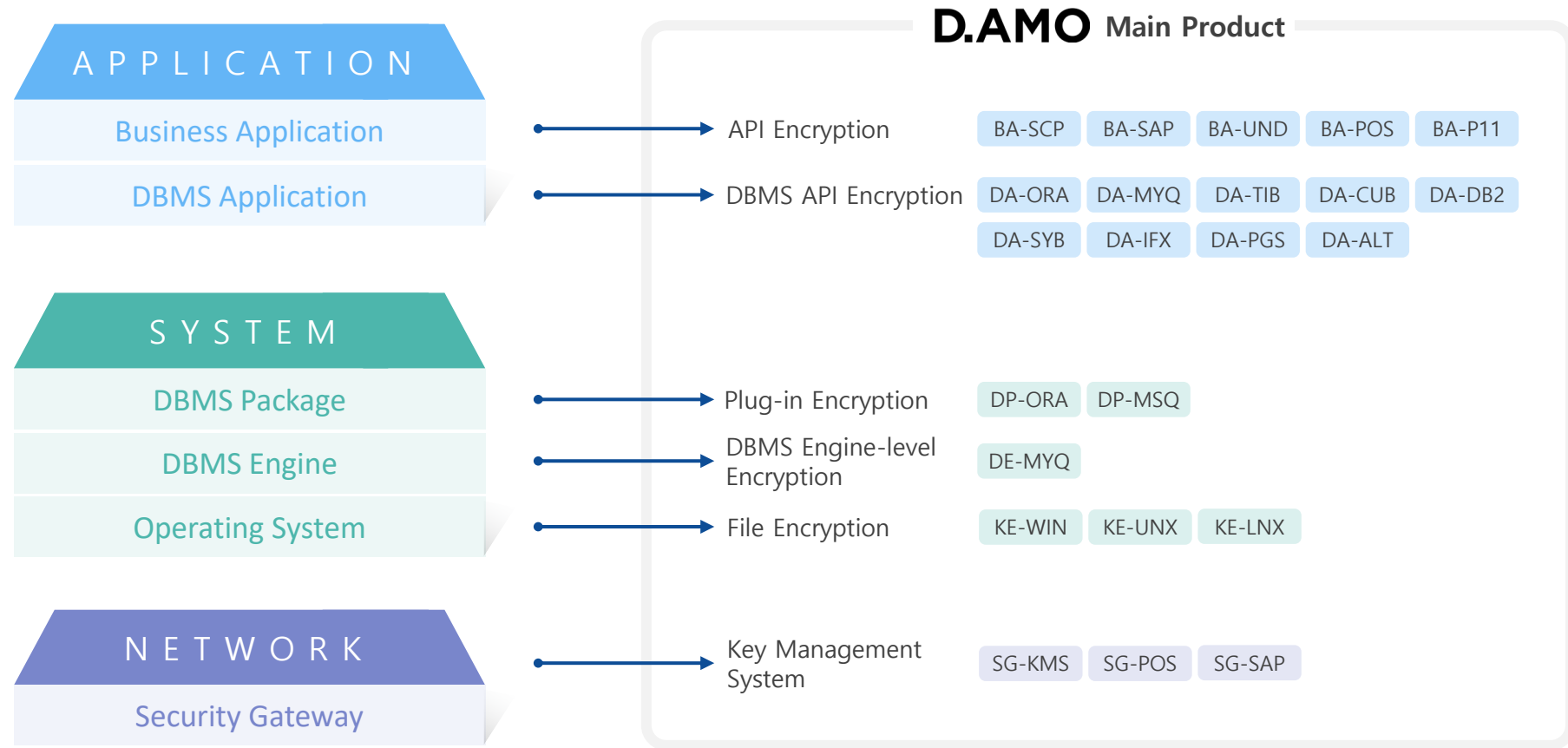
D.AMO uses CIS-CC, an independent cryptographic module with KCMVP certification obtained from NIS.

CIS-CC supports the largest number of algorithms compared to competitors, including all algorithms verified by NIS, and is optimized for each application to provide strong cryptographic function.



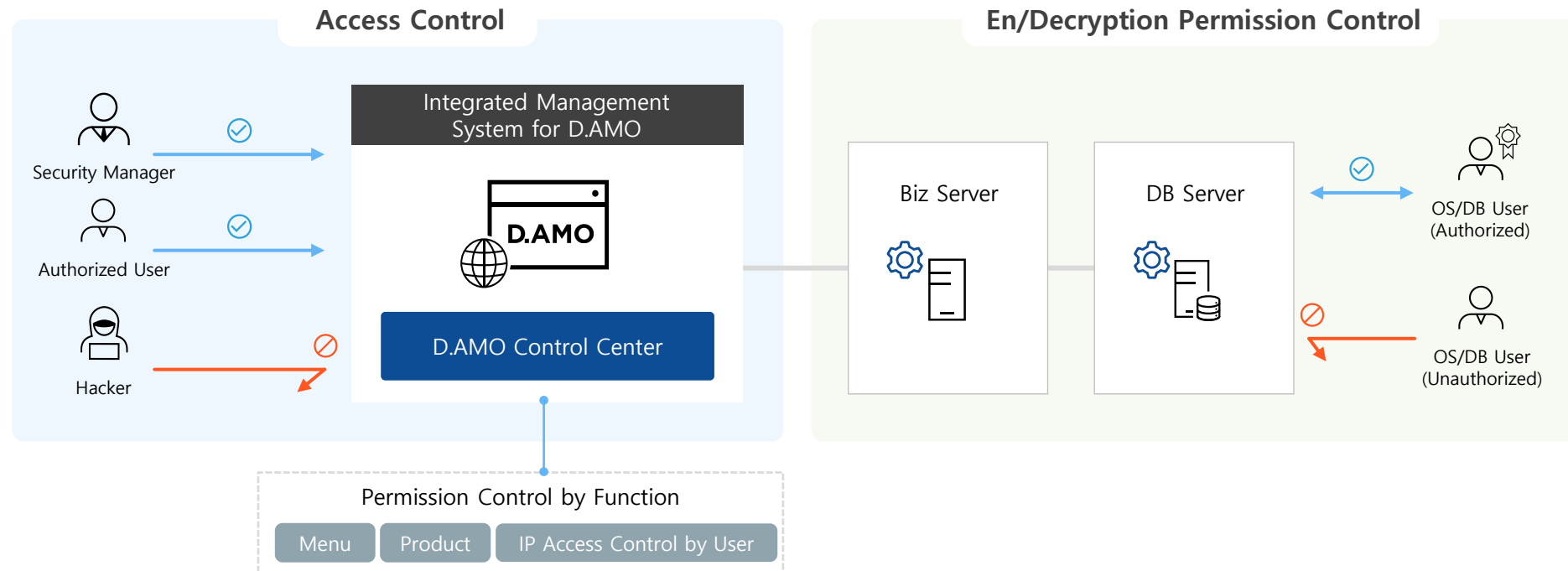
4. Encryption Applicable to Each Customer System Architecture

D.AMO has a variety of products with all system layers such as API, plug-in, engine, and kernel to optimize performance and security according to customer's system architecture.



5. Permission/Access Control

D.AMO can easily block access to unauthorized processes and DB accounts through access control policies and operate a convenient and safe encryption service by setting en/decryption permissions for each OS account.

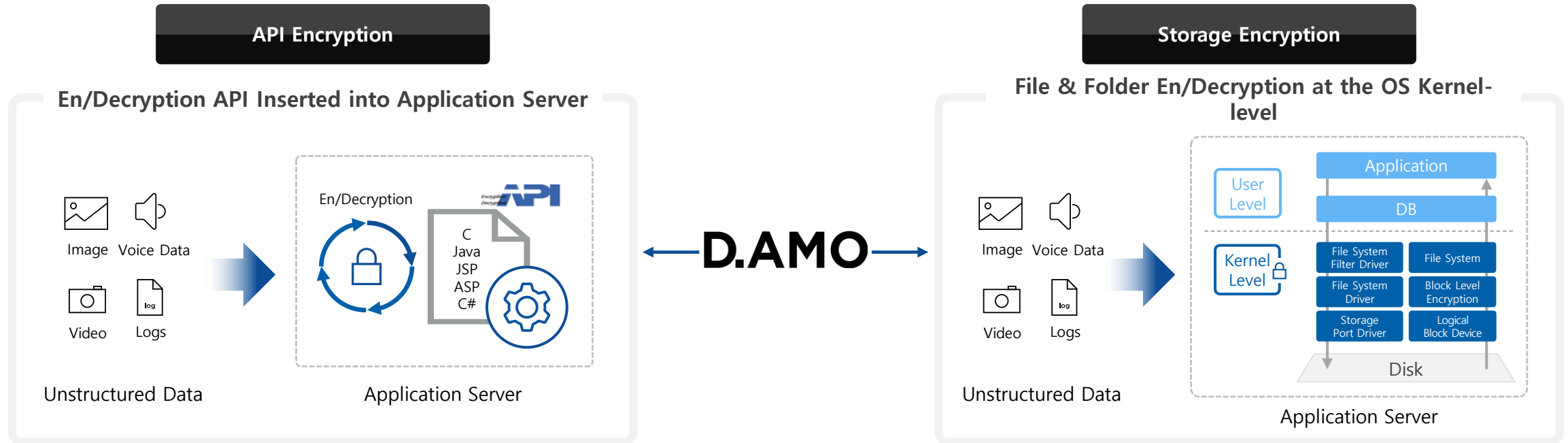


- Set menu and function access for each user through integrated management console
- Prevent secondary damage such as data breach by insiders

- Set en/decryption permissions for each OS account
- Control accesses by conditions: DB account, IP, MAC address, application and time/day of the week

6. Unstructured Data Encryption

D.AMO can encrypt even unstructured data – text, image, video, and voice data – whose format is not defined or is not organized in a defined way.

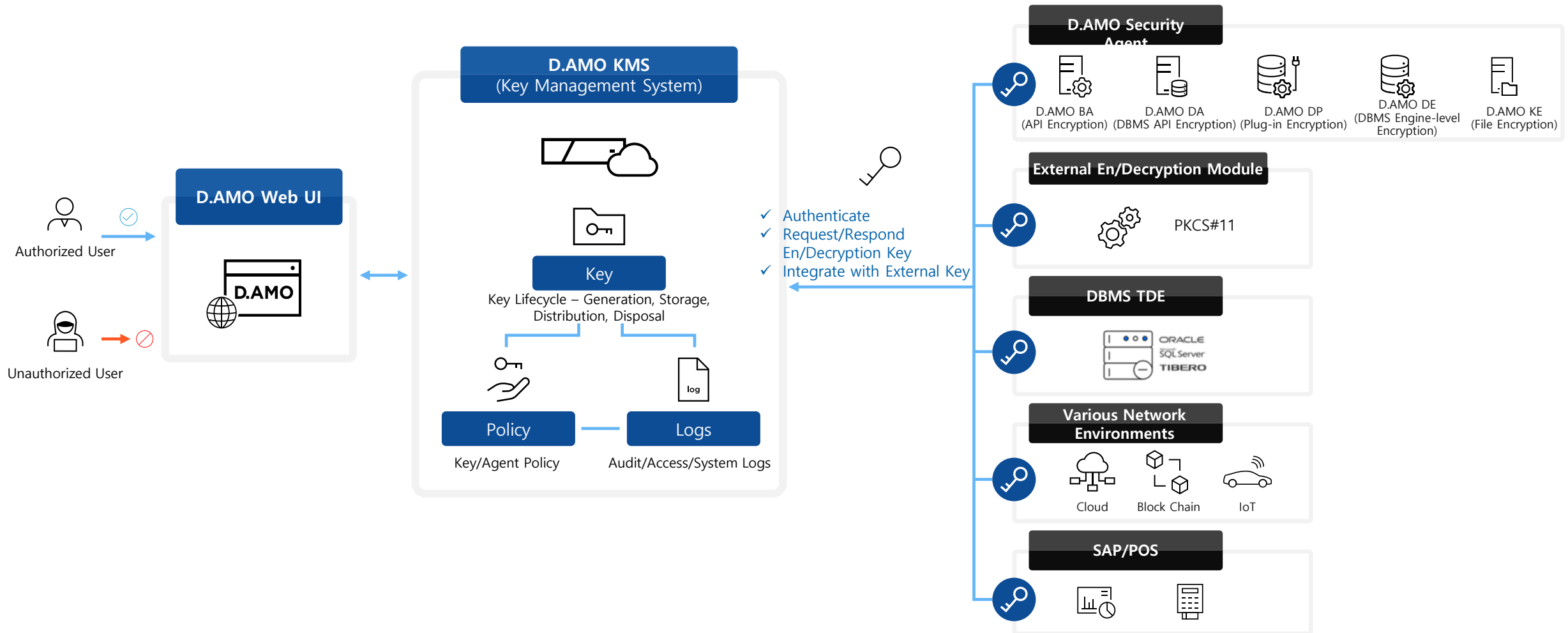


- Scheduling encryption
- Filter creation for selective encryption
- Encryption parallel processing

- Product installation available without API modification
- File/Folder-level encryption
- Encryption data backup

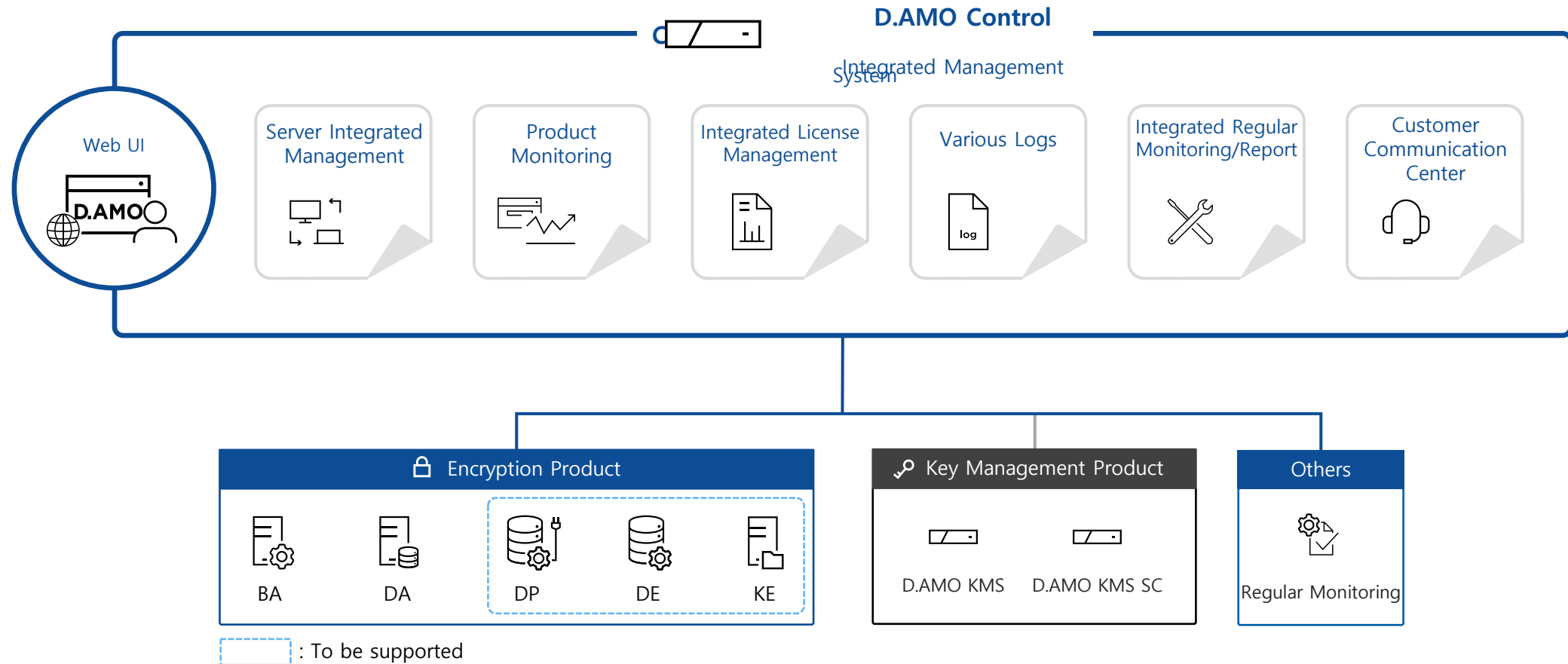
7. Key Management

D.AMO provides Korea's first CC-certified key management system to support interoperability with all D.AMO products as well as domestic/international commercial encryption products and manages the entire lifecycle of the cryptographic key: its generation, storage, distribution, and disposal.



8. Completion of Integrated Management System, D.AMO Control Center

D.AMO provides D.AMO Control Center, centralized management system of all D.AMO products installed in various environments, as default.



9. Acquired Domestic/International Certifications & Patents

With in-house-developed technology and 20 years of know-how, D.AMO is a reliable product holding domestic/international certifications and patents.

D.AMO

Certification History



NIS-verified Crypto Module



Common Criteria Certificate



GS Certification



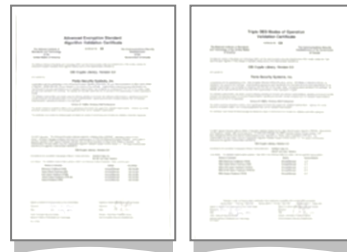
ISO Certification



SAP Security Certificate



Green Certificate



AES, DES FIPS 197/46-3 Certificate

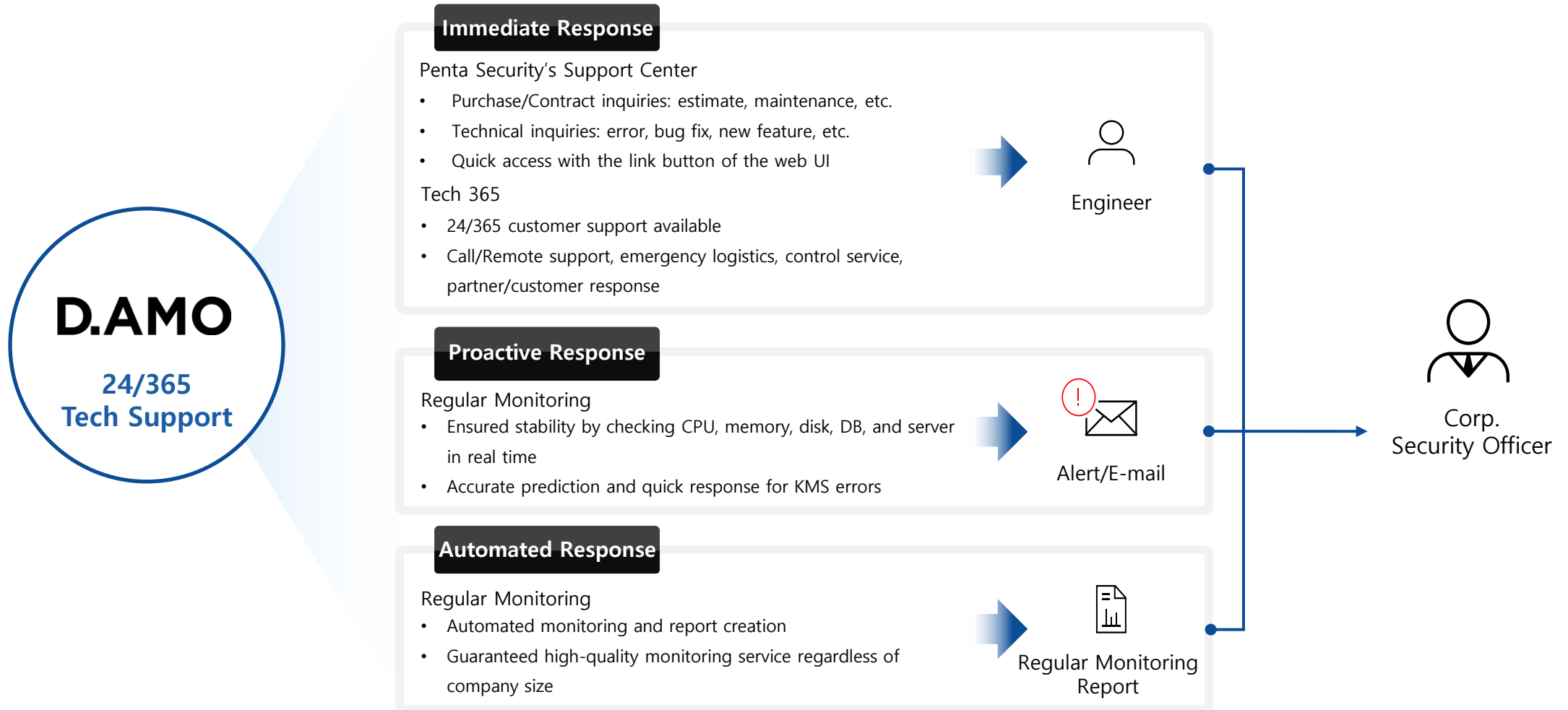
Patents (Holding 48 Cryptography Patents in Jan. 2024)

- Indexed column encryption (Korea)
- Query processing system & methods for DB with encrypted columns by query encryption transformation (Korea, US, Japan)
- Method & Apparatus for data security through property preserving encryption (Korea, Japan)
- Order preserving encryption method considering hypergeometric distribution (Korea)
- Data security method using a DB engine (Korea)
- Method for data security and data security system using key sync. (Korea)
- Apparatus & method for data security in cloud networks

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10. Strong Technical Support System

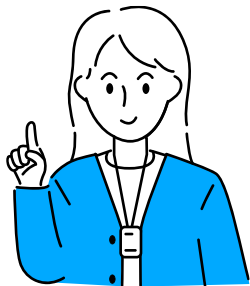
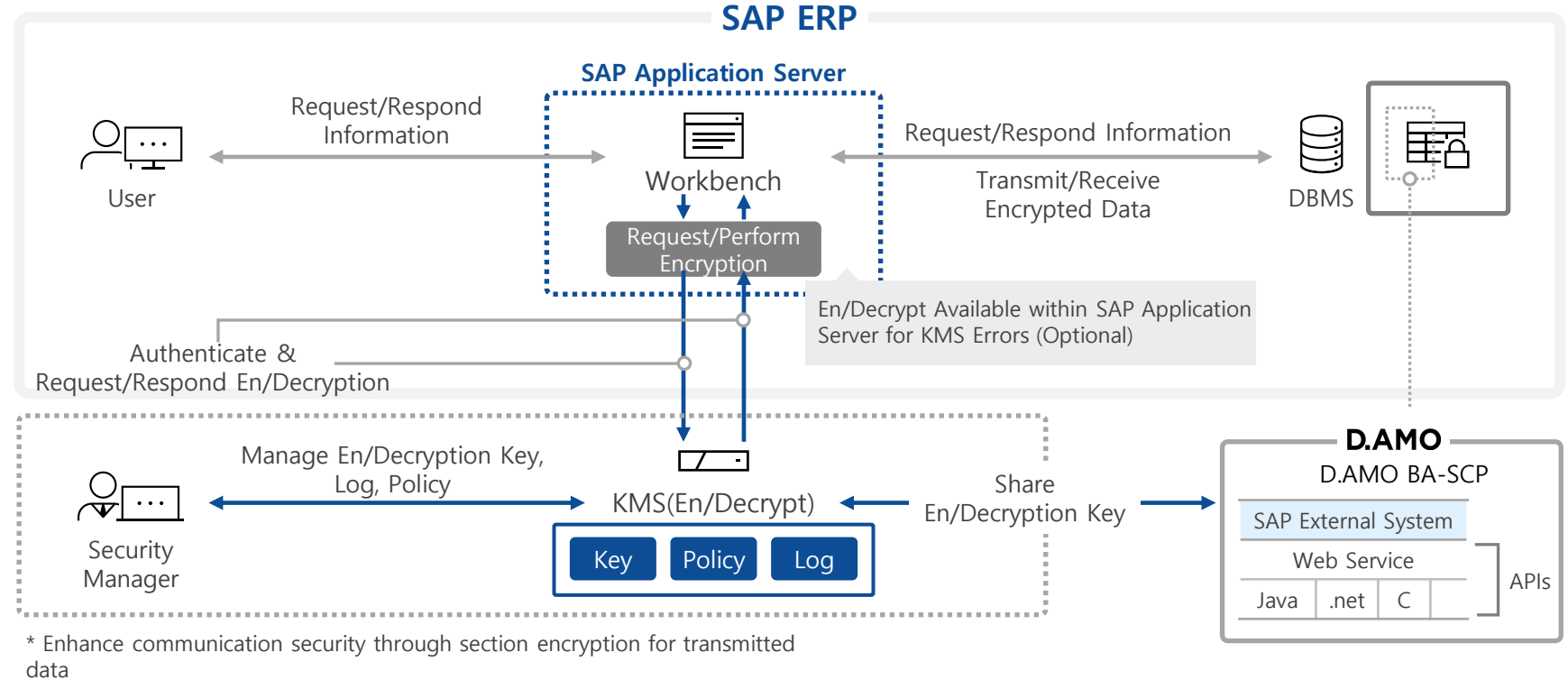
D.AMO provides 24/365 technical support services with immediate, proactive, and automated responses to ensure secure encryption even after its introduction.



Success Story

1. Bio Industry

- **Customer** Company S
 - **Employees** About 4,500
 - **Sales** KRW 3.13 trillion
 - **Installed in** 2019
 - **Purpose** Apply Encryption to Company's Own SAP ERP System
-
- **Why D.AMO?** Has SAP-specific Products with Rich and Skilled Experience
-
- **Encryption Method** En/Decrypt Data within SAP Application Server



Company S

"Successful encryption project for SAP ERP system thanks to D.AMO's rich experience and technical support!"

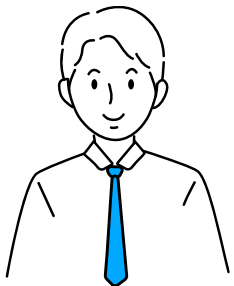
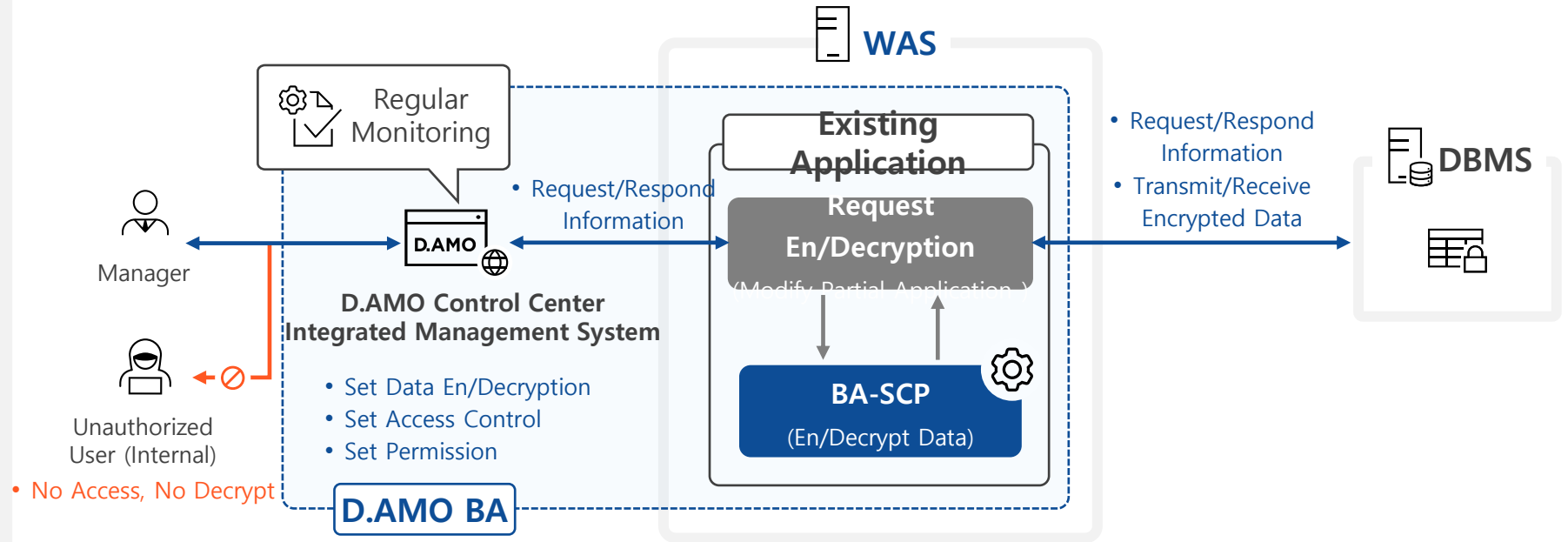
- **Benefits**
 1. Provides encryption services without modifying the size and format of the SAP ERP environment
 2. Safely en/decrypts data and manages keys with Korea's first H/W appliance specific to key management
 3. Meets the core security requirements of various domestic DB encryption products

2. Rechargeable Battery Industry

- Customer Company L
- Employees About 11,000
- Sales KRW 25.5986 trillion
- Installed in 2022
- Purpose National Core Tech. Encryption Project

- Why D.AMO? Components Applicable to Various Development Systems

- Encryption Method API-based En/Decryption in Application Server



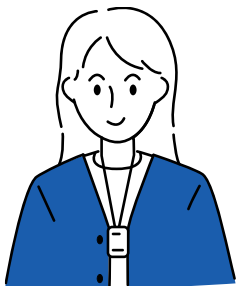
Company L

"Excellent performance and strong confidence for D.AMO's encryption products of Penta Security!"

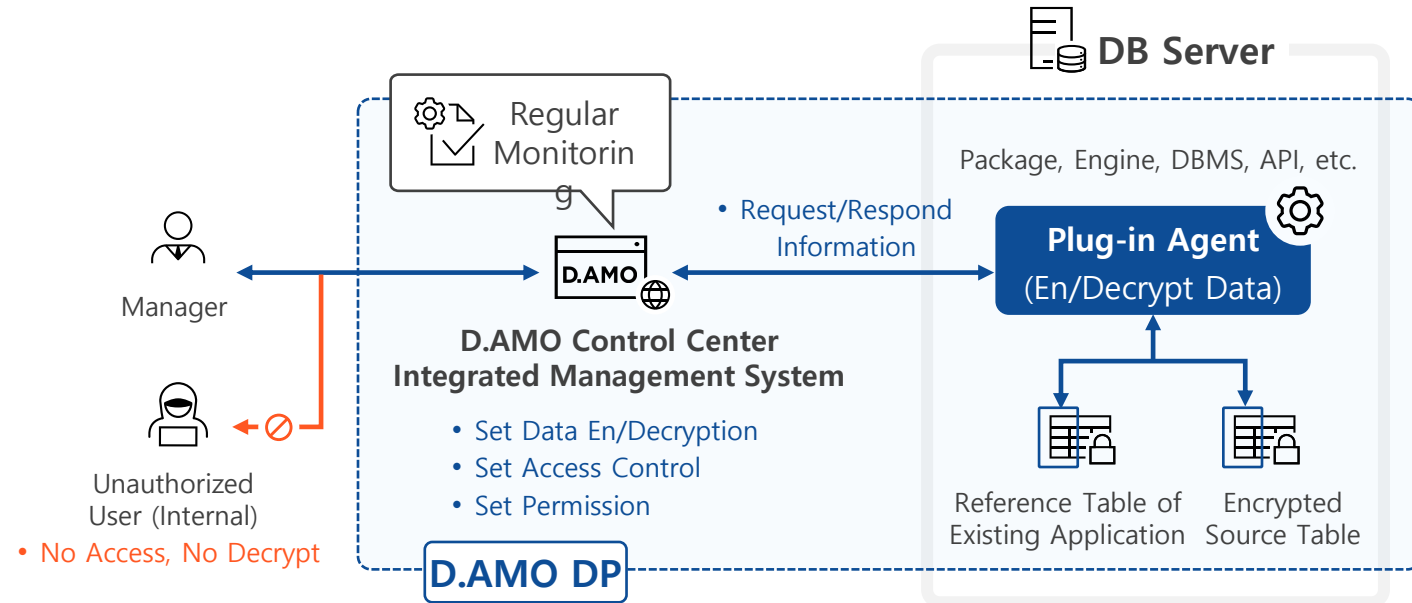
- Benefits
 1. Maximizes developer convenience by supporting libraries in different languages
 2. Complies with various laws and regulations regarding personal information
 3. Loads less than 4% due to the DB server in a distributed system
 4. Manages hundreds of BA-SCP operations through D.AMO Control Center

3. Semiconductor Industry

- **Customer** Company S
 - **Employees** About 32,000
 - **Sales** KRW 44.6481 trillion
 - **Installed in** 2021
 - **Purpose** Build New Encryption System at Semiconductor Factories in China
-
- **Why D.AMO?** Ensures Minimal Application Modification and Performance Impact
-
- **Encryption Method** Oracle Column-level Encryption



Company S



"Effectively built the system without load and optimized the existing system performance!"

- **Benefits**
 1. Reduces financial losses that occur in the event of data breach by applying data encryption
 2. Increases performance through pre-tuning of specific underperforming queries
 3. Searches encryption fields in real time due to index column encryption

Reference

1. Major Reference (1/2)

D.AMO has been operated stably in various public/financial institutions and corporations as well as different industries such as medical and communications.

Public Sector	Ministry of the Interior, Ministry of the Interior and Safety, Ministry of Foreign Affairs, Ministry of Science and ICT, Ministry of Economy and Finance, NATIONAL ASSEMBLY SECRETARIAT, Constitutional Court of Korea, Public Procurement Service, Military Manpower Administration, Ministry of Patriots and Veterans Affairs, Ministry of Government Legislation, Office for Government Policy Coordination, National Tax Service, Statistics Korea, Ministry of National Defense, Korea Forest Service, Korea Meteorological Administration, Fair Trade Commission, Ministry of Trade, Industry and Energy, Ministry of Oceans and Fisheries, Ministry of Justice, Ministry of Health and Welfare, Seoul Metropolitan Government, Gyeonggi Provincial Government, Chungbuk Provincial Government, Busan Metropolitan City Hall, Gyeongbuk Provincial Government, Sejong City Hall, Ulsan Metropolitan City Hall, Seoul Metropolitan Office of Education, GYEONGGIDO OFFICE OF EDUCATION, JEONBUK STATE OFFICE OF EDUCATION, Chungcheongbukdo Office of Education, INCHEON METROPOLITAN CITY OFFICE OF EDUCATION, CYBER INVESTIGATION BUREAU, Korea Coast Guard, Korea Customs Service , SUPREME PROSECUTORS' OFFICE REPUBLIC OF KOREA, KOREAN NATIONAL POLICE AGENCY, KOREAN INTELLECTUAL PROPERTY OFFICE, Ministry of Education, Ministry of Land, Infrastructure and Transport, Ministry of Unification, Ministry of Environment, etc.
Corporation/Public Corp./Association	KOREA GAS CORPORATION, Korea Expressway Corporation, KOREA TOURISM ORGANIZATION, PORT OF INCHEON, Korea Electric Power Corporation, Incheon Airport, Korea Environment Corporation, KOREA NATIONAL RAILWAY, KOREA HOUSING-FINANCE CORPORATION, Gimpo Urban Management Corporation, Korea Deposit Insurance Corporation, Korea Land and Geospatial Information Corporation, KOREA POST, KOREA INSTITUTE of CONSTRUCTION MANAGEMENT, National Health Insurance Service , Korea Transportation Safety Authority, KOREA MARITIME TRANSPORTATION SAFETY AUTHORITY, KOREA RAILROAD (KORAIL), Korea Minting, Security Printing & ID Card Operating Corp., KOREA ASSET MANAGEMENT CORPORATION, KOREA AIRPORTS CORPORATION, Seoul Metro, etc.
Finance	SAMSUNG CARD CO., LTD., Hyundai Securities Co., Ltd., KB Kookmin Bank, MIRAE ASSET, MIRAE ASSET SECURITIES.CO., LTD., DAISHIN Securities Co., Ltd., IBK INSURANCE CO, LTD, NH CAPITAL Co.LTD., Bank of Korea, Shinhan Bank, WOORI BANK, Standard Chartered Bank Korea Limited, BUSANBANK, iM Bank, BNK Kyongnam Bank, NH INVESTMENT & SECURITIES CO., LTD. , SHINHAN SECURITIES CO., LTD., SK Securities.Co., LTD., EUGENE INVESTMENT CO, LTD., KB Securities co.Ltd., Hana Securities Co., Ltd., KOREA INVESTMENT & SECURITIES CO,LTD., Hanwha Investment & Securities Co., Ltd., KB Kookmin Card Corp., WOORICARD, LOTTECARD CO., LTD., BCard, SAMSUNG CARD CO., LTD., Shinhancard Co., Ltd., Hana Card, LINA Life Insurance Co., Ltd., meritz Fire & Marine Insurance Co., Ltd., Samsung Fire & Marine Insurance Co., Ltd., KB INSURANCE CO. LTD., Prudential Life Insurance, HANWHA GENERAL INSURANCE CO., LTD., etc.

1. Major Reference (2/2)

D.AMO has been operated stably in various public/financial institutions and corporations as well as different industries such as medical and communications.

Military	Republic of Korea ARMY, REPUBLIC OF KOREA NAVY, Defense Agency for Technology and Quality, Defense Computing Information Agency, Republic of Korea Defense Communication Command
Education	Seoul National University, KOREAN NATIONAL POLICE UNIVERSITY, SUNGSHIN WOMEN'S UNIVERSITY, KOOKMIN UNIVERSITY, YONSEI UNIVERSITY, CHEONGJU NATIONAL UNIVERSITY OF EDUCATION, HANKUK UNIVERSITY OF FOREIGN STUDIES, KOREA NATIONAL SPORT UNIVERSITY, DONGDUK WOMEN'S UNIVERSITY , PUSAN NATIONAL UNIVERSITY, UNIVERSITY OF SEOUL, CHUNG BUK NATIONAL UNIVERSITY, KOREA NATIONAL UNIVERSITY OF TRANSPORTATION
General/ Communication	LG Electronics, LG Uplus Corp., BMW Korea, SONO HOTELS & RESORTS, GS Nextation, IDIS powertel Co., Ltd., CJ CheilJedang Corp., LOTTESHOPPING Co., LTD., Hanjin Shipping Co., Ltd, Oriental Brewery Co., YOUNGPOONG BOOKSTORE INC., NONGHYUPFEED CO., LTD., Daelim Co., Ltd., YEOCHUN NCC CO., LTD., SK Telecom Co., Ltd. , SK HYNIX INC., SK broadband CO.LTD., Doosan Corporation, CELLTRION INC., LG H&H Co., E-MART Inc., JW Pharmaceutical, Kakao Enterprise Corp., KakaoHealthcare Corp., Hanwha Corporation, Hanwha Galleria Corporation, LOTTE HOTELS & RESORTS, CJ Logistics Corporation, LG Energy Solution, GRAND HYATT SEOUL, Viva Republica Inc., CJ OLIVE YOUNG Corporation, ASIANA AIRLINES, etc.
Hospital	Seoul National University Hospital, THE CATHOLIC UNIV. OF KOREA ST. VINCENT'S HOSPITAL, Korean Hospital Association, SEOUL METROPOLITAN GOVERNMENT SEOUL NATIONAL UNIVERSITY BORAMAE MEDICAL CENTER, KOREA INSTITUTE OF RADIOLOGICAL & MEDICAL SCIENCES, NATIONAL HEALTH INSURANCE SERVICE ILSANHOSPITAL, NATIONAL FORENSIC HOSPITAL , SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL, Ewha womans university medical center, CHUNGNAM NATIONAL UNIVERSITY HOSPITAL, CHUNGBUK NATIONAL UNIVERSITY HOSPITAL, Korea University Medicine, National Medical Center, Seongnam Citizens Medical Center, etc.

D.AMO

Your Data's Guardian D.AMO
– Safe Sharing, Secure Communicating!





KOREA www.pentasecurity.co.kr

GLOBAL www.pentasecurity.com

JAPAN www.pentasecurity.co.jp



Cyber Security
Awards Application
Security 2020



IoT-based
Smart Security
Innovation Award 2020



Mwmbner of the
International
Transport Forum CPB
(~ 2020)



TU-Automotive Awards
Best Auto Cybersecurity
Product/Service 2019



Cybersecurity
Excellence Awards
Winner 2018



Hot Company in
Web Application
Security for 2016



SC Magazine Europe
Best SME Solution



ICSA Labs
Certified WAF



The First and
Only CCEAL4
Certified WAF



PCI-DSS
Compliance



Listed in Gartner®,
2023 Market Guide
for Cloud Web Application
and API Protection