HITACHI
Inspire the Next

Information Security Report 2016

Hitachi Group

Greetings

Hitachi Group is engaged in the social innovation business which creates new value through collaborative creation with customers and partners by combining OT (Operational Technology, such as the control and operation technologies which we have been developing for many years) with advanced IT and product systems.

In the future, we want to contribute to the realization of a society in which people can live safely, securely, and comfortably. By further taking advantage of digital technologies to evolve solutions, we aim to become the innovation partner in the IoT (Internet of Things) era.

The environment surrounding information security has changed drastically in recent years.

A society of Internet users and the rapid development of information technology means we use increasing amounts of new technology and services that save us money and increase convenience: such as cloud computing, smart devices, and social networking services. This means there is an increased risk and complexity associated with information security.

Especially, in addition to information being acquired by unauthorized access, cyber attacks (including targeted e-mail attacks, which have increased recently) are become increasingly sophisticated, causing problems such as damage to important facilities. This is leading to serious impacts on our society.

On the other hand, we recognize that, as a corporation that handles corporate customer information as well as personal information of members of the public through the IoT and Big Data, it has become necessary for us to operate with an awareness of human rights, including protection of privacy.

In these circumstances, we have been promoting our information security management cycle globally, and have been enhancing our information security, by methods such as implementing regulations and frameworks, implementing security measures that utilize information technology and other tools, educating general staff members and security specialists alike, and conducting inspections by auditors, under our “Information Security Policy”.

At Hitachi Group, in order to enhance cyber security, as well as to participate proactively in initiatives conducted jointly by government and citizens, we have also developed and constructed countermeasures to deal with these sorts of threats. We have done this in cooperation primarily with the Hitachi Incident Response Team but also across all business divisions, drawing fully on Hitachi' s business knowledge and the latest technology.

We aim to turn innovations in even safer and more secure social infrastructure systems into reality, by presenting customers with outcomes established right here.

I would be delighted if our information security activities, introduced in this report, are able to be of use to society, and are able to further increase the trust felt towards the Hitachi Group.

Shinichiro Omori
Senior Vice President and Executive Officer, CIO Hitachi, Ltd.

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Hitachi Group information security initiatives

Product and service information security assurance initiatives

〈Overview of this report〉

- Report scope and period: Hitachi Group information security initiatives until the 2015 fiscal year.
- Date published: August 2016

Basic approach to information security governance

Policy on information security governance initiatives

Hitachi regards initiatives for information security as vital for the safe management of information assets stored for customers in business operations that provide safe and secure social infrastructure systems. We have established information security initiatives policies shared by the Group, and are promoting enhanced information security activities.

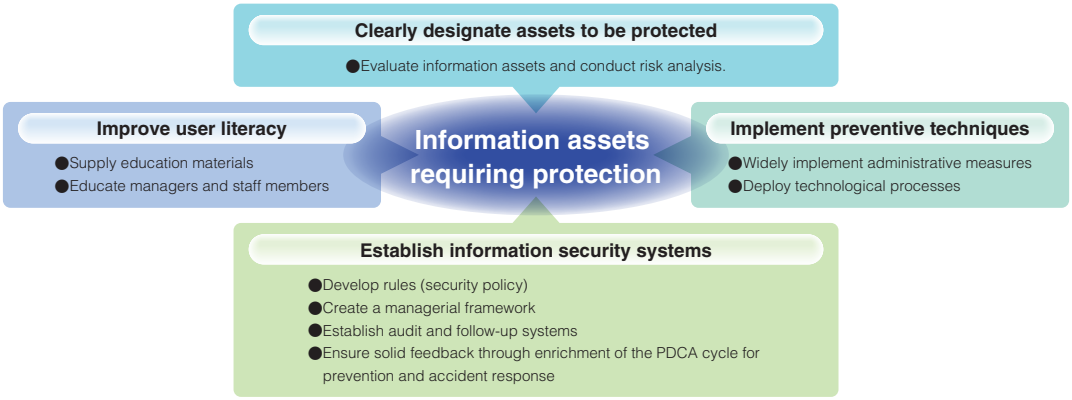
Approach to information security initiatives

Our approach to initiatives in information security encompasses four perspectives: ① Establishment of information security systems; ② Clearly designate of assets to be protected; ③ Improving user literacy, and; ④ Establishment of different types of security measures. We are making steady progress on action items for each of these perspectives.

Of these items we are paying particular attention to precautionary measures and prompt accident response, as well as improving staff ethical and security consciousness.

Furthermore, information security management PDCA (continuous improvement of activities) is moving forwards through the leadership of Hitachi, and we are working hard to improve security levels of the Group overall.

Basic approach to information asset protection >>



(1) Precautionary measures and prompt security response

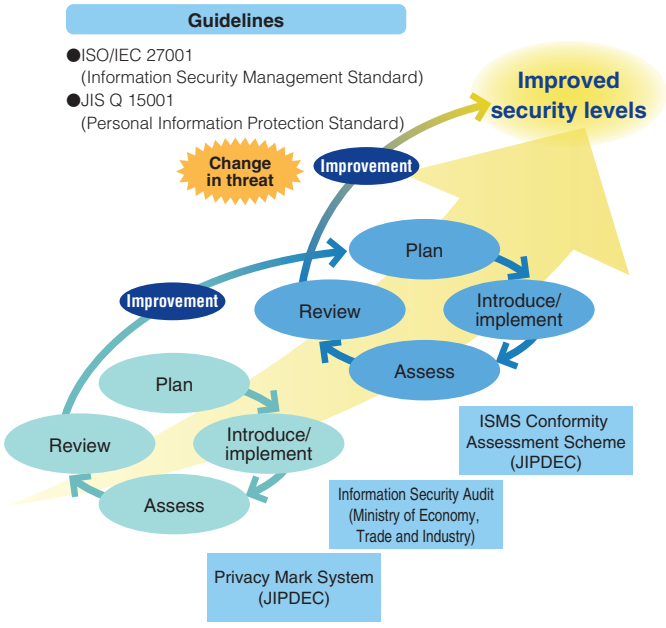
We clarify assets to be secured and have implemented safeguarding measures based on vulnerability and risk analyses.

We also have an emergency manual which we use for security breaches, based on the assumption that accidents are inevitable, and not just possible.

(2) Improving ethical and security awareness among staff members

We have prepared a program tailored to Hitachi' s various personnel levels including management and supervisors, and are working to improve ethics and security awareness through Group-wide e-learning. We are also conducting audits to identify and address problems at an early stage.

The PDCA cycle for security level improvement >>



Information Security Management System

Information security promotion and management cycles

Introducing Hitachi policies regarding information security, structures for promoting information security, regulations regarding information security, and information security management cycle.

Information security policies

Hitachi handles a lot of different information as a global supplier that offer total solutions, including our own technical information and information collected from customers. We have established information security policies and related regulations in order to protect the value of this information, and maintain information security in an appropriate manner.

Based on this policy, we are expanding information security measures that support every aspect of business activities: such as enhancing cyber security, preventing information leakage caused by human errors, and protecting personal information such as social security and national ID numbers.

Information security policies >>

1. Formulation and continuous improvement to information security management regulations
We recognize information security initiatives as a major issue in management as well as business activities, and establish information security management regulations that comply and adapt to laws and other standards.
Furthermore, we establish information security management systems for the whole company that center on our executive officers, which we implement faithfully.
In addition, we maintain and continuously improve information security in terms of organization, human resources, physical systems, and technology.

2. Protection and continuous management of information assets
We plan safe management systems in order to appropriately protect information assets we handle from threats to confidentiality, integrity, and availability.
We also take appropriate control measures for business continuity.

3. Strict observance of laws and standards
We strictly observe laws and other standards regarding information security.
We also make our information security regulations conform with such laws and other standards.
If these are found to be violated, we check staff working regulations and take the appropriate action.

4. Education and training
We conduct education and training in order to increase executive officer and staff member awareness of information security.

5. Incident prevention and management
We strive to prevent information security accidents from occurring, and in the case that an accident occurs, promptly take the appropriate measures, including measures to ensure the accident does not happen again.

6. Assurance of fair business practices within the corporate group
We will construct a system to ensure fair business practices in the corporate group made up of Hitachi, Ltd. and Hitachi, Ltd., Group Companies, according to policies 1 to 5 listed above.

Information security promotion

The President will appoint the Chief Information Security Officer with rights and responsibilities towards information security, and the Information Security Chief Auditor with rights and responsibilities towards information security auditing.

The Chief Information Security Officer will set up the Information Security Committee, and determine policies, educational programs, and different measures regarding information security.

Decisions made by the Information Security Committee will be implemented at each business site through the Information Security Promotion Council attended by working-level employees from all business sites.

At business sites, the business site head will be the Information Security Officer.

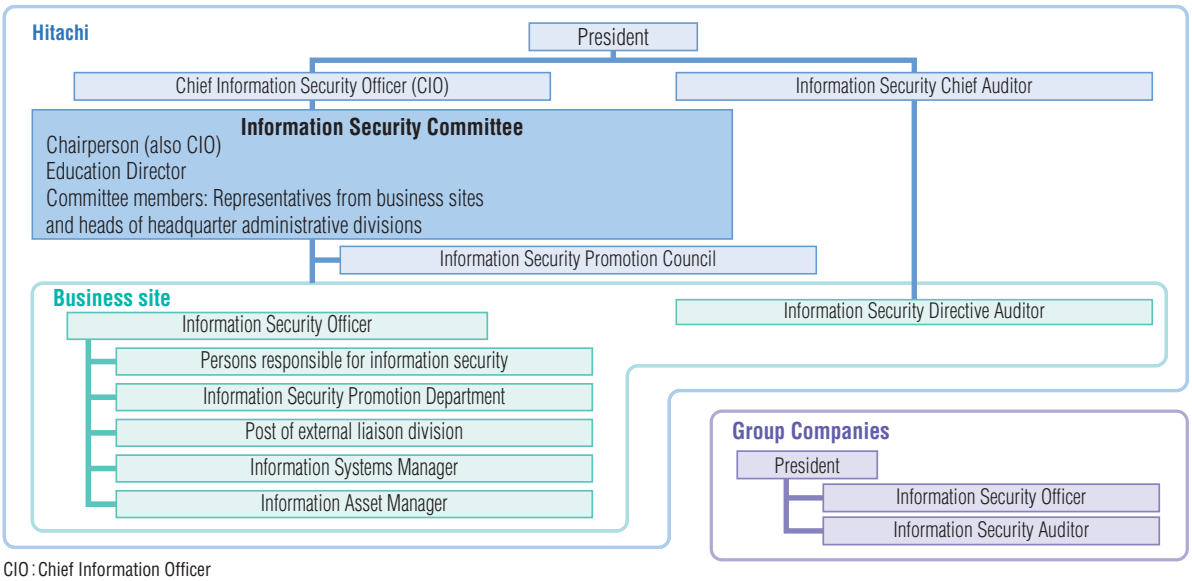
An Information Security Promotion Division will also be established, which will deal with personal information protection, information security, management of confidential information, entrance/exit management, and vendor management across all business sites in an integrated manner, as well as implement educational activities to promote a thorough awareness of information management amongst staff members at business sites.

An Information Asset Manager will be placed in all divisions, and responsibilities will be allocated regarding handling of information assets.

A similar organization will be established in Group Companies, and there will by mutual cooperation to promote information security across divisions.

Information Security Management System

Information security promotion >>



CIO : Chief Information Officer

Information security regulations

Regulations have been established as displayed in the table below based on information security policies, in order to maintain information security.

Information security regulations >>

Category	Regulation name	Details
Basic regulations	General Rules for Information Security Management Systems	We have established basic conditions relating to the formulation, implementation, maintenance, and continuous improvement of the Information Security Management System, based on the "HITACHI Company Conduct Standards", and aim to ensure the confidentiality, integrity, and availability of Hitachi's information assets including personal information, protecting this information.
	Information and Information Equipment Handling General Provisions	We have established basic conditions relating to handling and management of information and information equipment, and aim to promote the safe use of information, as well as prevent leaks of information overall by mediums such as paper and in information or other systems, and accidents caused by the misappropriation of information, by strict observance of regulations.
	Management Regulations for Confidential Information	We have established provisions necessary for the handling of confidential information based on the "HITACHI Company Conduct Standards", and aim to maintain confidentiality.
Individual regulations	Rules on Website Creation and Information Disclosure	We have established provisions requiring strict adherence so that information is disclosed and used correctly, and aim to provide an environment in which customers and staff members can use information effectively and with ease of mind.
	Systems Management Regulations for Information Security	We have established basic management provisions regarding information systems based on the "General Rules for Information Security Management Systems", aiming to ensure information security.
	Management Regulations for Entrance/Exit and Access Restriction Zones	We have established necessary provisions regarding the principals of entrance/exit management and premises access restrictions, as well as the designation of prohibited areas and their management and operation, and aim to protect confidential information.
Management of personal information	Management Regulations for Personal Information	We have established provisions to be strictly adhered to regarding the appropriate protection of personal information in accordance with laws and guidelines stipulated by the national government regarding the handling of personal information, and aim to protect the rights and interests of the individual, as well as prevent business losses and loss of social credibility. We have established the provisions, procedures etc. necessary to fulfil our responsibilities regarding operation/management systems creation, management regulation implementation and strict adherence, and personal information protection.
	Consignment Criteria for Business Handling Personal Information	We have established specific procedures for situations in which personal information stipulated in the Management Regulations for Personal Information is consigned to external vendors, and aim to manage and protect personal information in an appropriate manner by preventing external leakage, manipulation, destruction, or loss of personal information we possess.

Group Companies have also establish similar regulations, and we encourage them to manage this information.

●Three Principles for Preventing Leakage of Confidential Information

Hitachi has formulated Three Principles for Preventing Leakage of Confidential Information, and always pays sufficient caution to the handling of its own and its customers' information, working to prevent information leaks.

Principal 1: In principal, no confidential information shall be taken outside of the company's premises.
Principal 2: Any person taking confidential information out of the company' s premises when necessary for conducting business shall obtain prior approval from the Information Asset Manager.
Principal 3: Any person taking confidential information out of the company' s premises when necessary for conducting business shall carry out the necessary and appropriate measures to prevent information leakage.

Information Security Management System

●Basic regulations

The “General Rules for Information Security Management Systems” stipulates basic provisions that must be adhered to in a strict manner regarding the formulation, implementation, maintenance, and continuous improvement of information security management systems.

The “general provisions for information and information equipment handling” establishes basic conditions regarding handling and management of information and information equipment with the objective of preventing accidents caused by leakage of overall information, or the misappropriation of information.

The “Management Regulations for Confidential Information” stipulates how to handle protection of confidential information.

●Individual regulations

The “Rules on Website Creation and Information Disclosure” stipulate provisions for strict observance in order that information is disclosed and used correctly on the website.

The "Systems Management Regulations for Information Security” stipulates procedures to ensure the security of information systems.

The “Management Regulations for Entrance/Exit and Access Restriction Zones” includes stipulations about physical security assurance, for example regulations regarding how to manage entering and exiting buildings.

●Handling of personal information

We have established personal information regulations equivalent to JIS Q 15001: 2006 “Personal information protection management systems — Requirements” in order to carry out management activities at a level higher than the Personal Information Protection Law.

Our “Management Regulations for Personal Information” stipulates provisions, procedures etc. necessary to fulfil responsibilities regarding operation/management systems creation, management regulation implementation and strict adherence, and personal information protection.

Our “Consignment Criteria for Business Handling Personal Information” stipulates specific procedures for consigning work that deals with personal information to outside vendors, stipulating appropriate management and protection of personal information.

Information Security Management Cycle

Information security management is based on the PDCA (Plan-Do-Check-Action) cycle.

Plan: We formulate information security policies and measures, and plan information security education and audits.

Do: We expand the security measures internally, putting them into practice.

We educate staff members about information security, ensuring there is a thorough understanding of the measures.

We hold promotion conferences for information security, where each business site is provided with information about security, and feedback on implementation status of measures.

Check: We inspect the operational status of security systems periodically, and implement audits based on audit plans as well as management reviews carried out by a manager.

We also review management systems through a representative depending on changes in the management environment or internal or external opinion.

Action: We review audits and management systems, and take corrective measures based on internal and external opinions.

Information Security Management System

Information security audits

Information security audits are carried out once a year under the direction of the Information Security Chief Auditor appointed by the President.

The following criteria will be checked in an information security audit.

- Correspondence of management systems for information assets and information security measures to information security regulations.
- Correspondence of personal information management systems to the Personal Information Protection Law and JIS Q 15001: 2006.
- Correspondence of personal information protection management systems and JIS Q 15001: 2006 .

Group Companies are also requested to perform an information security audit once a year.

Information Security Education

●Information Security Education

Continuously maintaining information security requires all parties to continually develop their knowledge of information handling and to remain strongly aware of the issues.

In order for this to be achieved we carry out education programs for all staff members in accordance with the roles displayed in the table below.

Information security education list >>

Target audience	Mode	Details
Education for all staff	e-learning	Basic education regarding personal information protection, prevention of information leaks, and management of confidential information.
Management education	Self-study, partial classroom style	Necessary information for managers about personal information protection, information security, and management of confidential information.
New staff member education	Classroom style	Necessary information for new staff members about personal information protection, information security, and management of confidential information.
Information security staff	Classroom style, partial practical exercise	Detailed knowledge about information security and management of confidential information. Practical education based in real examples.
Personal information protection staff	Classroom style, partial practical exercise	Knowledge regarding protection of personal information (PrivacyMark). Practical education based in real examples.
Information Asset Manager	Self-study, partial classroom style	Knowledge necessary as a person in charge of managing information assets for a division.
Information systems staff	Classroom style, partial practical exercise	Education for information systems supervisors regarding network security, security incident response, web application security, and outsourcing server security

●Training for targeted cyber attack e-mails

The threat of cyber attacks via targeted e-mail is getting stronger, and it is vital that all staff members develop a resistance so that they can respond in the appropriate manner in the case that they are targeted.

Hitachi has been conducting targeted cyber attack e-mail training for all staff members at Hitachi as well as in Group Companies since 2012.

We actually send a mock e-mail disguised as a targeted cyber attack e-mail to all training staff members in order to increase their ability to judge what a suspicious e-mail is, and how you deal with it when you receive one, through actual experience.

●Other support

We distribute an abridged pamphlet version of the “Proper management and handling of Confidential Information” to all staff members to make sure that regulations regarding confidential information management are well known throughout the staff.

Information security technical initiatives

IT based information security measures

At Hitachi we are working on a comprehensive plan to prevent problems like multiple cyber attacks, malware infection, unauthorized access, and information leaks, and are always looking for cutting edge IT security measures to counter new threats.

Safe and secure Hitachi IT security

At Hitachi Group, we have developed a secure Group-wide IT infrastructure environment, which allows Group staff members to share information between over 900 domestic companies.

Uniform security measures which are able to be implemented promptly in an emergency situation have been realized with the standardization and sharing of the IT infrastructure environment.

Hitachi Group products are incorporated proactively into this process, and feedback about their performance results are provided to product design departments, contributing to the further growth of Hitachi Group products.

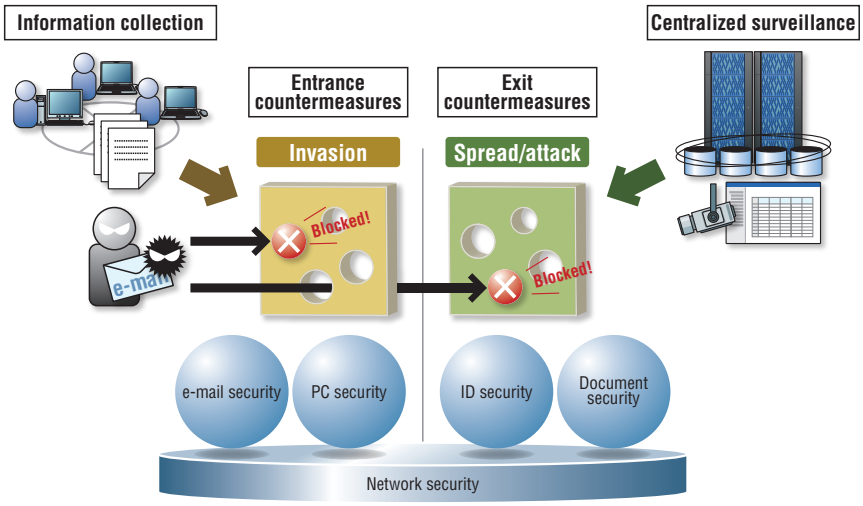
Hitachi IT security systems and multi-layered defenses against cyber attacks

Security systems based on Hitachi IT consist largely of network security (external connections to the Internet or other systems, proxies, and remote access), e-mail security, PC security, document security, and ID security, and Hitachi has established measures for each of these types of systems, which we implement in a robust manner.

We understand it is important that countermeasures taken against cyber attacks, in particular targeted cyber attacks, need to be addressed without delay, and to be carried out on a continuous basis.

We are taking the following measures using the approach shown in the diagram below in order to achieve these outcomes.

- Collecting and utilizing incident information by the CSIRT.
- Adding more layers to our leak prevention systems (entrance and exit countermeasures) and defending important information.
- Understanding and analyzing attacks through centralized surveillance in order to minimize damage.
- Implementing prompt incident operations.
- Conducting cutting edge research about cyber attacks and educating and fostering personnel who deal with security issues.



Information security technical initiatives

Network security

1. External connections

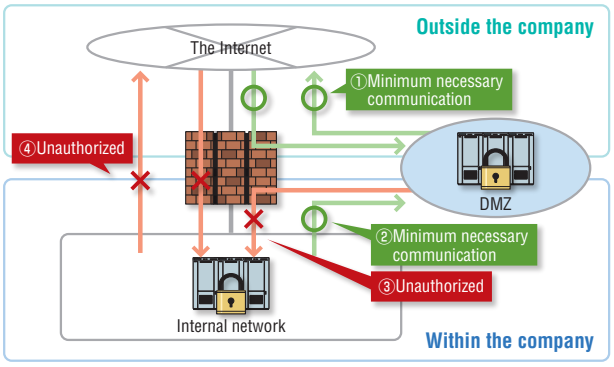
A firewall is in place at the point of connection when an external and internal network connect in order to disclose information to outside the company or to share information, creating a DMZ*1.

With a firewall in place there can be no direct internal and external communication. We use an indirect method to send information.

The IPS*2 monitors and blocks unauthorized access at the point of connection to the Internet.

Periodic security audits are also carried out on all servers and network equipment that releases information to outside the company, checking whether there are any security problems.

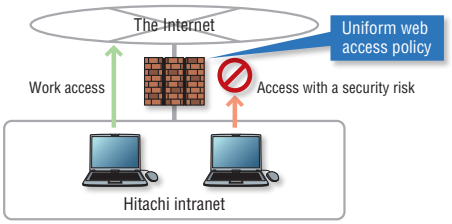
*1: DeMilitarized Zone *2: Intrusion Prevention System



2. Proxy

We are implementing the following countermeasures with a gateway in order to lower risk when accessing the Internet for work.

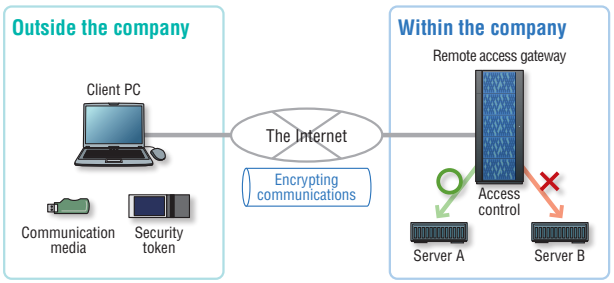
- Limiting users, and saving and auditing logs with the use of certification.
- Filtering URLs via a standardized policy.
- Checking for web virus'.



3. Remote access

We prevent information leaks with a gateway using the following strategies.

- Implementing two-factor authentication
  (Authentication by authentication media or other method in addition to ID or password.)
- Encrypting communication in certain sections like the Internet.
- Controlling server access



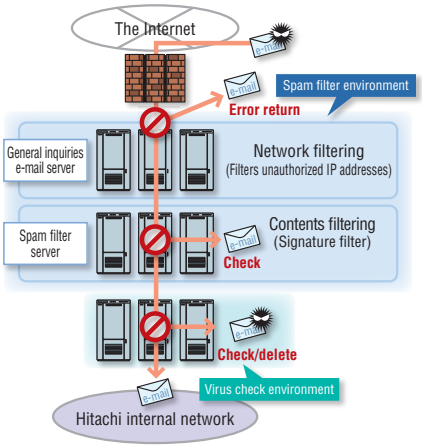
Information security technical initiatives

E-mail security

Hitachi has taken measures against external threats as well as threats that are generated internally.

1. Countermeasures against external threats

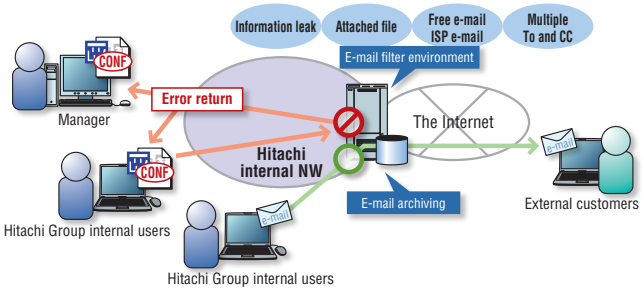
< Spam filters and virus checks >



Hitachi's e-mail delivery structure is especially responsive towards ① the threat of computer virus invasion, and ② the threat of spam e-mails, when protecting PCs from external threats.

2. Countermeasures against internal threats

There is an e-mail filter server in place for dealing with internal threats which is especially responsive to ① the threat of the spread of computer virus, and ② the threat of information leaks, and permits transmission of only e-mails without any issues.



PC security

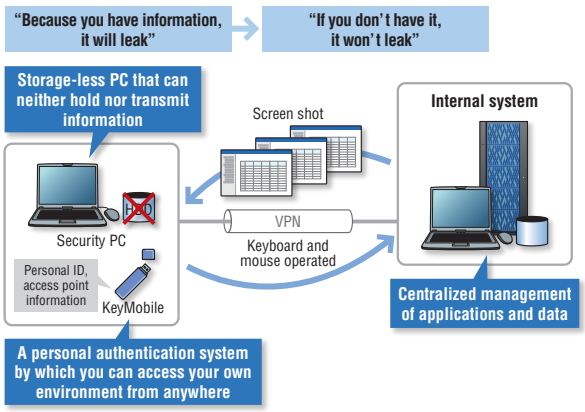
Security measures for PCs, which are tools and equipment that handle information, are located in the internal system environment terminal (the end point), which can be thought of as the last bastion.

The following can be given as risks associated with PCs, however, the risks change according to the combination of internal and external factors.

(1) Information leaks by PCs or external media being physically taken outside of the company.
(2) Unauthorized access and computer virus infections that exploit weak points.

We take the following preventative measures regarding (1), paying particular attention to the following two points.

●Turn mobile PCs into thin clients



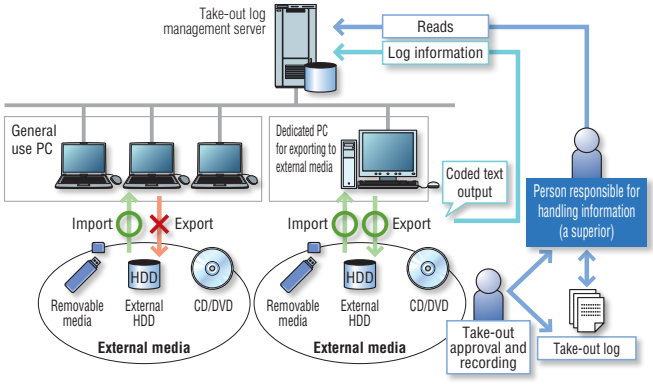
Information security technical initiatives

●Control output from external media, have a management log for output

Staff members are not able to export information from their PCs to external media.

If information is physically taken out, approval from a superior is necessary, and a PC specifically for taking off the premises must be used.

Depending on vulnerabilities, risk will increase as time passes, so we carry out measures periodically, and have constructed a system of inspection, maintaining and managing PC security.



ID Security

Certification and access control on an individual level is a vital part of information security infrastructure.

At Hitachi Group, we have developed a Group-wide authentication infrastructure, making security levels uniform across the entire group, raising standards across the board.

The three authentication infrastructure objectives are as follows.

1. Management of authentication/access control information

Information on IT users is managed in an integrated way with a common system, preventing information renewal failures, ensuring the information is always up to date, and improving accuracy.

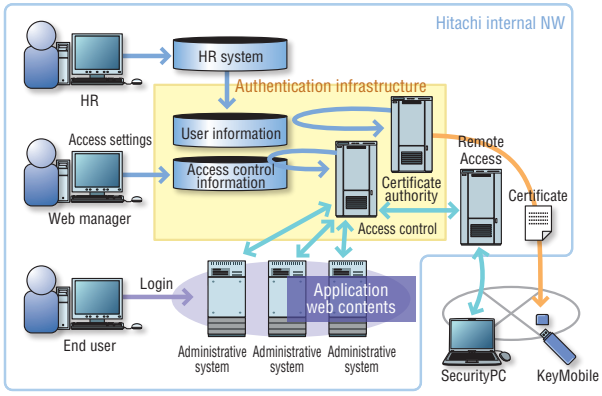
2. Authorization and access control on an individual level

We manage multiple access restrictions for each individual IT user, thus carrying out appropriate access management.

3. Promotion of a ubiquitous environment

Hitachi Group staff members are able to use the systems they need from anywhere with the same conditions, with a common access control system for each administrative system.

Furthermore, the information stored in the authentication infrastructure must be always up to date, and always be highly accurate.



In order for this to happen, the following two steps are being taken.

1. ID registration

The HR department registers user information, and updates authentication infrastructure with new information in a prompt manner.

2. Freshness maintenance

Not only passwords, but also IDs have an expiration date, and the ID will become invalid after the period has passed.

Information security technical initiatives

Document security

As documents are being shared frequently with information sharing programs etc., there is an increased risk of information leaks.

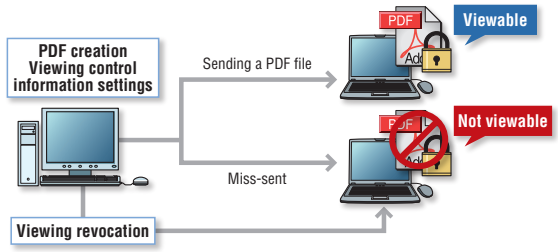
In particular, it is very easy to duplicate electronic documents, meaning the damage caused when information is leaked is even bigger.

Because of this situation, the following preventative measures have been put in place.

1. Prevention of information leaks by suspension of electronic document viewing

In general, if an electronic document has been leaked, there is no way of stopping it being viewed.

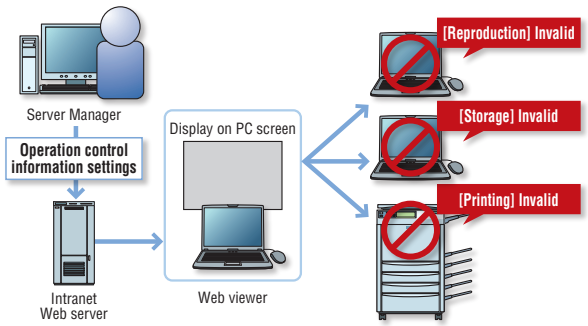
As a countermeasure, there are document settings for enabling or disabling viewing, duplication, and printing, and if information on a document does get leaked to outside the company, viewing of the document can be stopped by revocation of the owner.



2. Prevention of web server contents information leaks

The intranet web is used widely for sharing information internally. It is possible to download the information displayed on the browser to the PC, and it is also possible to print it on to paper, meaning there is a constantly inherent danger of information leaks.

Because of this, there are settings for enabling or disabling functions of contents uploaded onto the website, like duplication, saving, and printing, in order to decrease the risk of information leaks.



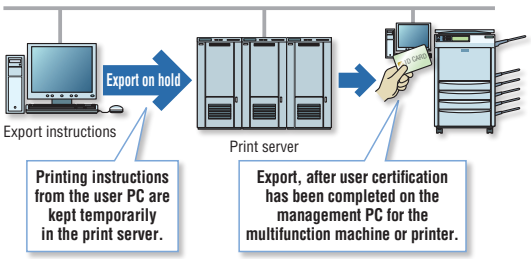
3. Preventing information leaks with paper output from the printer

Leaving printed paper lying around can be a source of information leaks.

This problem occurs because people forget to go and retrieve their paper after pressing the print button on the computer; therefor, the problem can be solved by making it necessary to perform operations at the printer as well as the PC.

At Hitachi, printing from a PC means only that the printing information is stored on the printer server. The user can only print onto paper by operating the management PC located next to the printer.

At this time, the person printing must undergo individual authorization, by inserting their ID card in the management PC in order to identify themselves.



Cloud computing security initiatives

Achieving safe use of the public cloud

In recent years, the public cloud has gained a lot of attention as a tool for implementing information systems. While the public cloud has the advantages of speeding up the building of information systems and reducing operating costs, there is a risk of information leakage. At Hitachi, we have implemented guidelines for controlling risks when using the public cloud, lowering such risks.

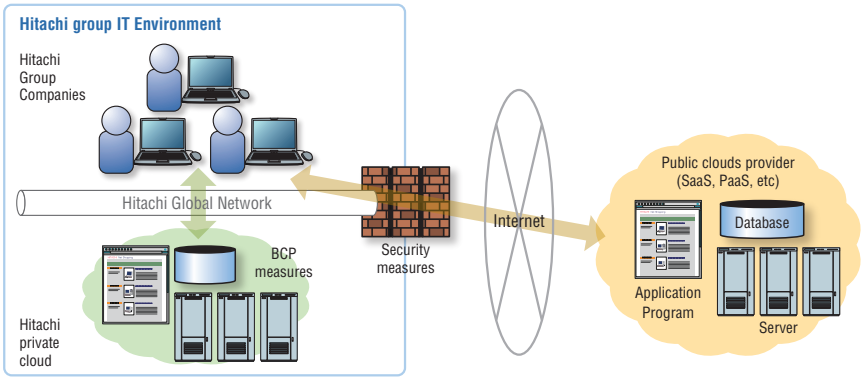
Cloud computing security initiatives

Cloud computing (“the cloud”) has been gaining a lot of attention in recent years. Generally speaking the cloud refers to “a method of using software or data etc. that is conventionally monitored and used on your desktop computer through networks like the Internet on an as-need basis, in the form of a service” *. There are two types of clouds, “private clouds” , which are created in the IT environment of a particular company or other entity, and “public clouds” , which are created by a service provider, and offered through the Internet.

At Hitachi, we are working towards consolidating a private cloud that can be shared by all companies in the Group, thereby implementing the security measures and service continuity during disaster situations stated in the “Information Security Technical Initiatives” section of this document. On the other hand, as displayed in Diagram 1, the public cloud is an area to which these initiatives do not extend, so Hitachi has reduced the risk of data leakage when the public cloud is used by establishing the “Guidelines for Using Public Clouds” .

*IT Term Dictionary e-Words, http://e-words.jp/, 1997-2013

Diagram 1 Public cloud system >>



SaaS: Software as a Service PaaS: Platform as a Service BCP: Business Continuity Plan

Establishing the Public Cloud Usage Guidelines

As shown in Diagram 1, there is a risk of information leakage when using the public cloud through unauthorized access to the public cloud, as data and applications exist on the public cloud. In particular, there is already an increased risk of cyber attacks like unauthorized access by user identity fraud in IT services offered on the Internet, and there is concern that there is also a risk of information leakage with the public cloud. There is also the risk to business continuity, in that if the public cloud vendor goes bankrupt, user business might be interrupted, or data might be lost.

In order to decrease these risks, Hitachi Corporate indicates what sort of risk countermeasures are necessary when using the public cloud through the Public Cloud Usage Guidelines (the “Guidelines”), thus lowering risk.

The Guidelines include risk reduction measures relating to the risk of information leakage, for example processes for authentication and information protection necessary when using the public cloud, and requirements for public cloud vendors operations. Hitachi is also working on validating the degree of conformity to the Guidelines necessary for instances of public cloud use, in order to promote risk reduction through application of the Guidelines.

Physical security initiatives

Promotion of enhanced physical security

Physical security measures like office entrance/exit management and installation of security cameras are indispensable for the prevention of information leaks and crime. Hitachi Group promotes standardized Group-wide physical security countermeasures.

Standardization of physical security measures across all companies

Conventional physical security measures used to be conducted at each business site in an independent style centering on entrance/exit management, however, a basic policy for infrastructure has been established in order to reinforce measures, which are being implemented in a standardized manner across all companies.

[Basic policy for infrastructure]
①Homogenize management and maintenance systems by company-wide unified standards.
②Implement management systems that utilize Hitachi Group products and services.

Outline of Physical Security Infrastructure

(1) Integration of design and infrastructure for management zone security levels

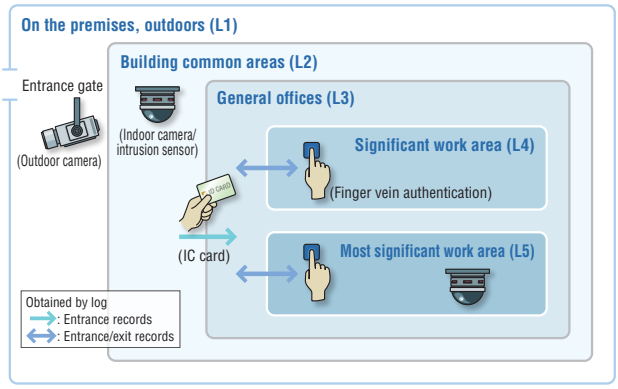
Management zones have been classified into five security levels, entrance/exit management method and placement standards for security cameras and intrusion sensors according to security level have been stipulated, and facilities and equipment have also been standardized.

(2) Utilization of Hitachi Group products and technology

Hitachi Group products are being utilized as entrance/exit management equipment, security cameras, and intrusion sensors.

Hitachi Group leading technology “finger vein authentication” has been introduced, in particular as a method for personal identity verification when entering significant zones.

Zone security levels and countermeasures >>

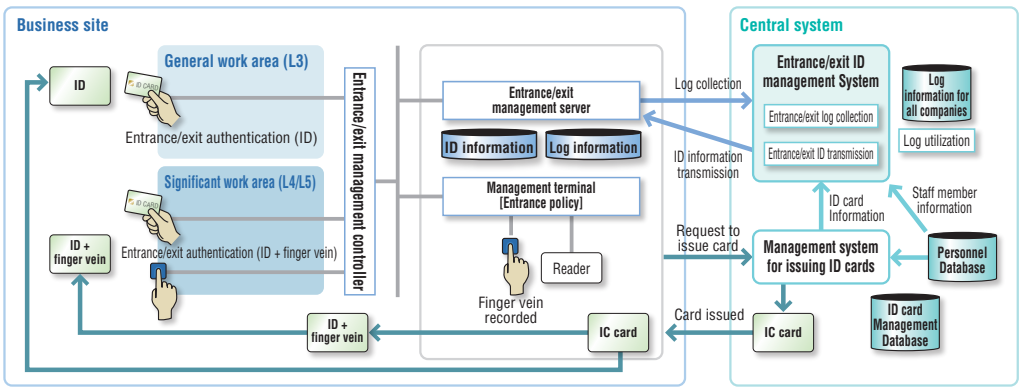


(3) Streamlining of business utilizing central systems

Hitachi has developed an ID card issuance management system and an entrance/exit ID management system utilizing personnel databases across all companies in order to streamline and standardize entrance/exit management to business sites, which is now in place.

Forensic data like entrance/exit logs are managed in an integrated way, and utilized effectively.

Entrance/exit management system schematic diagram >>



Initiatives in cooperation with procurement partners

Information security assurance initiatives in cooperation with procurement partners

As a corporate group that provides products and services that support social innovation business, Hitachi is working on information security measures in cooperation with its procurement partners. An agreement relating to the prevention of information leakages must be signed in advance when consigning work that deals with confidential or personal information. Our procurement partners also implement information management equivalent levels of security to Hitachi, and are making every effort to prevent accidents occurring or recurring.

Information Security Assurance with Procurement Partners

As corporate groups that support social innovation business, Hitachi' s procurement partners are implement the same level of management as Hitachi, and are making every effort to prevent accidents occurring or recurring.

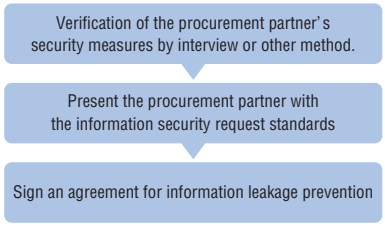
(1) Selection of procurement partners

When consigning work that involves the handling of confidential or personal information to a procurement partner, we perform a status review of their information security measures based on Hitachi' s own standards before allowing access to confidential information.

A business relationship only commences once an agreement regarding the prevention of information leakage that fulfils the security levels demanded by Hitachi has been entered into with the procurement partner.

Furthermore, Hitachi will perform a separate verification specifically for the handling of personal information on the occasion of consigning work that handles personal information.

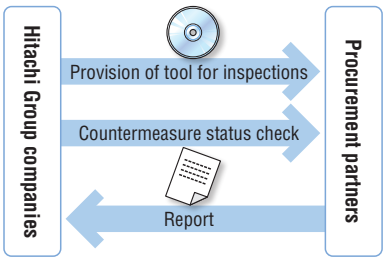
Work will only be consigned to procurement partners that have fulfilled the conditions of the review as an outcome of verification.



(2) Information security accident prevention measures

In order to prevent information leaving the company via the Internet by file exchange software, Hitachi provides information security tools, and carries out inspections to delete work information from individual' s PCs and other devices.

We also check whether information security measures are being implemented as specified in agreements with procurement partners, and suggest appropriate improvements based on the results of those checks.



(3) Strategies for information security accidents and recurrence prevention measures

If an information security accident occurs, an impact survey will be carried out together with related departments including the procurement partner, and as well as working on implementing measures to make sure any problems are solved expediently, Hitachi will also investigate the cause of the accident and make sure there are no recurrences in cooperation with the procurement partner.

In the case that a serious accident has occurred, or there is complete lack of improvement seen in the procurement partner, the continuation of a business relationship will be re-evaluated.

(4) Future initiatives

Hitachi will constantly check measures procurement partners have in place regarding information security with the aim of preventing accidents, and in addition to this, will work towards strengthening collaboration, and continue to carry out reliable preventative measures.

Cyber security vulnerability handling and incident response initiatives

Security incident initiatives

The Hitachi Incident Response Team (HIRT) is an organization that supports Hitachi' s cyber security countermeasure activities. They contribute to the realization of a safe and secure network environment for customers and companies by preventing security incidents, and by providing a prompt response if an incident does happen.

What is an incident response team?

A security incident ("incident") is an artificial event related to cyber security, and refers to actions (events) such as unauthorized access, service disruption, or data destruction.

An incident response team is a group that leads "incident operations" in order to cooperate inter-organizationally and internationally to solve problems, through preventing (readiness: pre-handling) and resolving (response: post-handling) incidents, and has basic capabilities for "predicting and adjusting to threats from a technical perspective," "conducting technical collaboration activities," and "liaising with external communities on technical aspects."

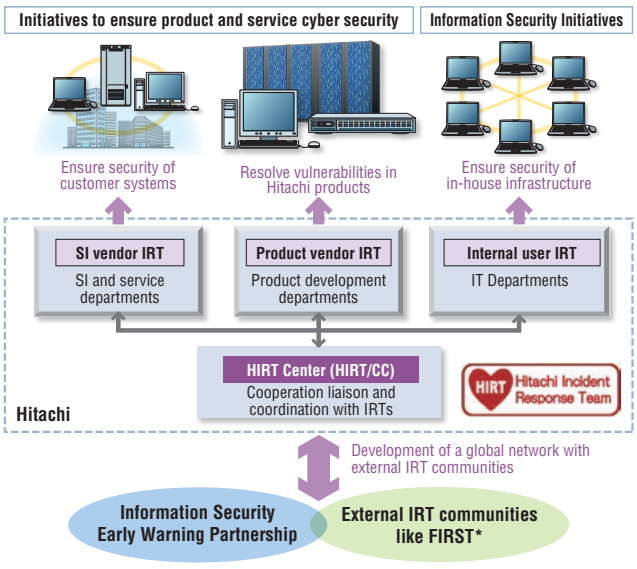
HIRT activities model

The role of the HIRT is to provide ongoing assistance for Hitachi' s cyber security countermeasure activities through vulnerability handling (eliminating vulnerability that threatens cyber security), and incident response (evading and resolving cyber attacks), from the perspective of organization solo activities (information security initiatives targeted at Hitachi corporate information systems), and organization collaborative activities (initiatives to ensure product and service cyber security targeted at customer information systems or control systems). Furthermore, HIRT' s mission is also to contribute to a safe and secure Internet society by catching any signs of future threats and taking actions as early as possible. The HIRT has adopted an activities model consisting of four IRTs as listed below, in order to expedite both vulnerability handling and incident response.

The four IRTs are:

(1) The team that develops information and control system related products (Product Vendor IRT).
(2) The team that uses those products to develop systems and provide services to customers (SI (System Integration) Vendor IRT).
(3) The team that operates and manages Hitachi information systems as an Internet user (Internal User IRT).
(4) A HIRT/CC (HIRT Center) will be put in place to adjust the work load between each IRT, and while making the role of each IRT clear, is a model that promotes efficient and effective security that promote inter-IRT cooperation.

Four IRTs supporting vulnerability handling and incident response >>



Category	Role
HIRT/CC*	Corresponding sections: HIRT Center Promote vulnerability handling and incident response through collaboration with external IRT organizations like FIRST, JPCERT/CC* and CERT/CC*, and SI vendors, product vendors, and between internal user IRT.
SI vendor IRT	Corresponding sections: SI/Service provision Support vulnerability handling and incident response for customer systems by ensuring the security of customer systems in the same manner as internal systems for vulnerabilities that have been exposed.
Product vendor IRT	Corresponding sections: Product development Promptly investigate whether any disclosed vulnerabilities have impacted products, and if there are problems, support measures to counter vulnerabilities in Hitachi products by providing a patch or other solution.
Internal user IRT	Corresponding sections: Internal infrastructure provision Support the advancement of vulnerability handling and incident response in order that the Hitachi related sites do not become a base point for invasion.

*HIRT/CC : HIRT Coordination Center
FIRST : Forum of Incident Response and Security Teams
JPCERT/CC : Japan Computer Emergency Response Team/Coordination Center
CERT/CC : CERT/Coordination Center
SI : System Integration

Cyber security vulnerability handling and incident response initiatives

Activities actioned by the HIRT Center

HIRT Center activities, in the capacity of internally-oriented IRT activities, include moving cyber security measures forwards on both a systematic and technical level by cooperating with information security supervisory divisions in charge of systems as well as quality assurance divisions, and assisting different divisions and Group Companies with vulnerability handling and incident response.

Hitachi is also promoting cyber security measures formulated by collaboration between IRTs as a point of contact for external IRTs.

●Internally-oriented IRT activities

Internally-oriented IRT activities include issuing alerts and advisories containing business knowledge obtained by collecting and analyzing security information to internal organizations, as well as providing feedback about products or service development processes in the form of guidelines or support tools.

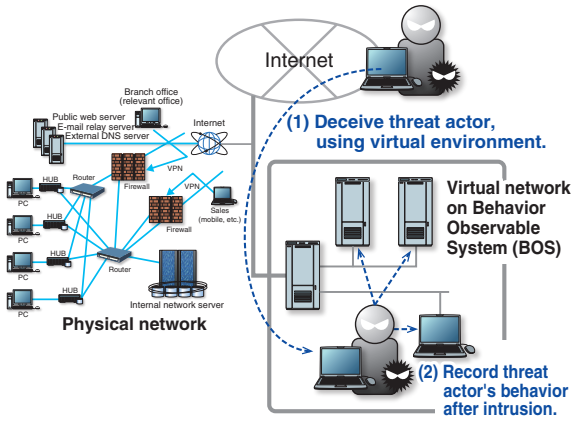
(1) Collecting, analyzing, and disseminating security information

The HIRT Center disseminates information and business knowledge relating to vulnerability handling and incident response to the other teams through promotion of the Information Security Early Warning Partnership

(2) Developing a framework for research activities

The HIRT Center is engaged in "Observation of Threat Actors Activitie" as a technology to "catch any signs of future threats and take actions as early as possible".

BOS (Behavior Observable System) for Observable Threat Actors Activities >>



"Observation of Threat Actors Activities" is an observation method that uses a virtual environment of the organization's internal networks to investigate targeted attacks and other cyber attacks, and records and analyzes the behavior of a threat actor following an intrusion.

(3) Improving product and service security technology

The HIRT Center fleshes out security measures for products related to information and control systems, develops and administering those processes, and promotes the handing down of technology to expert personnel.

(4) Implementing IRT activities for individual domains

The HIRT Center promotes the investigation and organization of IRT activities specific to individual business domains in order to flesh out responses informed by the context and trends in each domain.

●Externally-oriented IRT activities

Externally-oriented IRT activities involve the cooperation of multiple IRTs in promoting the development of inter-organizational alliances with the objective of tackling new threats, and the development of cooperative relationships that can contribute to the mutual improvement of IRT activities.

(1) Reinforcing domestic cooperation of IRT activities

Organization of a foundation for information use and application based on JVN jointly operated by the JPCERT Coordination Center and the Information-technology Promotion Agency, Japan and the promotion of strengthening of partnership with the CSIRTs through the Nippon CSIRT Association.

(2) Reinforcing overseas cooperation of IRT activities

Organization of a system of coolaboraton between overseas IRTs that make use of FIRST activities and overseas product vendor IRTs, and the promotion of incident operations that utilize STIX and the like.

(3) Developing a framework for research activities

Joint research with academic organizations, fostering opportunities for personnel development through participation in academic research activities such as the Anti Malware Engineering Workshop, and promoting the education of researchers and engineers with specialist knowledge.

Reference information >>

■Hitachi Incident Response Team
http://www.hitachi.co.jp/hirt/
http://www.hitachi.com/hirt/

Global information security initiatives

Promoting global information security

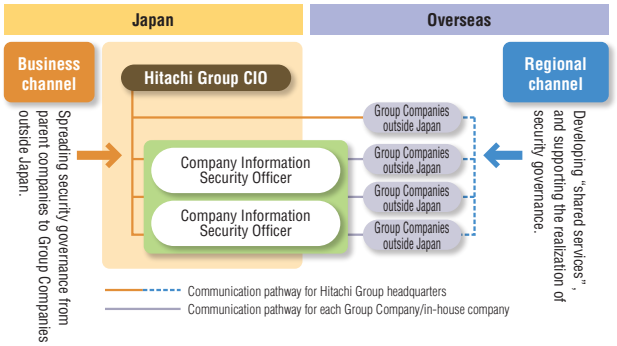
It is necessary for all Hitachi Group Companies worldwide to address strengthening of information security upon ensuring corporate public credibility. Hitachi has designated global information security management standards based on the international standards ISO/IEC 27001, and is promoting and working on the PDCA cycle.

Global information security structures

Hitachi employs two governance channels, a business channel and a regional channel, as its communication channels, the most significant prerequisite for the promotion of global information security.

These two channels constitute a system by which, through their effective utilization, issues particular to different regions or countries can be solved efficiently.

Furthermore, utilization of secure shared services has been proactively developed, with the aim of unification of security measures infrastructure and streamlining of IT investment.



Establishing global information security management regulations that conform with international standards

Effective utilization of IT as a foundation of business in order to expand Hitachi Group global business into the future is a vital strategy, and "Universal IT Policies" are being established to this end.

"Global Information Security Management Regulations" have been established in compliance with "Universal IT Policies" and the international standard for Information Security Management Systems (ISO/IEC 27001), in order to promote security governance.

The Management Regulations and related documents contain security risk measures that can be implemented with certainty, which were established upon consideration of the perspectives of developing countries experiencing significant growth, and the growth of Group Companies outside Japan, that also continue to support competition which opens up global business.

The PDCA cycle for improving levels of global information security

Hitachi promotes the PDCA cycle (continuous improvement) for the continuous operation, maintenance, and improvement of information security in order to improve security levels as stated in the "Global Information Security Management Regulations".

Group Companies outside Japan conduct self-checks to determine their security status.

The results of these checks are being visualized and analyzed in order to understand situations in different regions and different Group Companies outside Japan, and in the future, will be utilized during the formulation of the direction for Global Security Policies, which must be addressed by the entire company.

Personal information protection initiatives

Personal information protection guaranteeing security and trust

Hitachi was granted the Privacy Mark certification in March 2007, for implementing safe personal information management and protective measures. Hitachi operates the “personal information protection management system” , which is a framework for the protection of personal information, and is working continuously on personal information protection and appropriate handling for staff members as well as all other stakeholders.

Personal information protection

Hitachi has implemented management regulations for personal information that correspond to Japan Industrial Standards “Personal information protection management systems - Requirements (JISQ 15001: 2006)” , which stipulate management standards to a stricter level than the Personal Information Protection Law. These regulations are based on the “Hitachi personal information protection policies” , which stipulate principals and policies relating to personal information protection for the purpose of protecting personal information important to the owner of that information.

Hitachi obtained third-party certification, the “Privacy Mark” (granting institution: JIPDEC) in March 2007, granted to vendors that are recognized as taking appropriate security management and protection measures related to personal information. The certification was renewed for the fourth time in March 2015.

Hitachi strives to protect personal information with a sense of self awareness and responsibility as a vendor with Privacy Mark certification, maintained so that all stakeholders are able to provide Hitachi with personal information with peace of mind.

Hitachi Privacy Mark >>

System for promoting personal information protection

In April 2009, Hitachi merged the “Personal Information Protection Promotion System” and the “Information Security Promotion System” , and commenced the new “Information Security Promotions System” . Our aim is to realize a highly practical management system through the unification of management systems related to significant information including personal information, and systems related to information security.

Through this unification, we have carried out the four safety management measures required by the “Personal Information Protection Law” and other regulations, and have unified the “Information Security Technical Initiatives” , “Physical Security Initiatives” and others, promoting the protection of personal information.

The specific management structure is as stated in the “Information Security Promotion System” clause of the “Information Security Management System” .

Hitachi also strives to safeguard personal information globally at Group companies outside Japan based on the “Personal Information Protection Policy” and by adhering to all applicable laws and regulations, including social requirements.

〈Four measures for safety management〉

(1) Organizational Safety Management Measures:
Structuring and operating regulations and systems, verification of their implementation, etc.
(2) Human Resources Safety Management Measures:
Entering into non-disclosure and other agreements, education and training, etc.
(3) Physical Safety Management Measures:
Management of entrances/exiting buildings (rooms), theft prevention measures, etc.
(4) Technical Safety Management Measures:
Access control of information systems, unauthorized software countermeasures, etc.

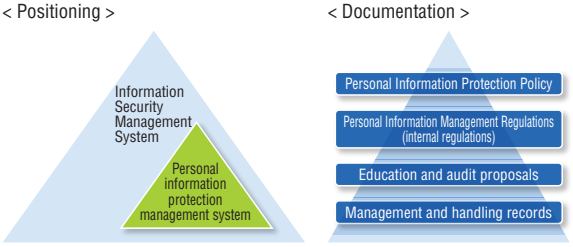
Personal information protection initiatives

Personal Information Protection Management System

The “Personal Information Protection Management System” (PMS) has also been positioned as part of the “Information Security Management System” (ISMS) in addition to the unification of management systems, with the exclusion of the operation of a section which is specific to personal information protection.

The “PMS Documentation” , which is a document containing the basic elements of the PMS, is made up of the “Personal Information Protection Policy” , “Personal Information Management Regulations (internal regulations)” , “proposals” for audits, education and similar, and a “record” of PMS implementation.

Hitachi personal information protection management system >>



Management and appropriate handling of personal information

Hitachi strives for strict management and appropriate handling of personal information entrusted with us, according to internal regulations “Personal Information Management Regulations”.

A person in charge of protecting personal information (an Information Asset Manager) is located at each workplace, and identifies all personal information entrusted to Hitachi, managing logs and carrying out appropriate measures according to the seriousness of that personal information.

This person also carries out periodic education on personal information protection, personal information protection audits, and checks status of operations in workplaces, in order to make personal information protection management systems an established practice.

In addition, they will also distribute the “Personal Information Protection/Information Security Card” to all staff members, and make sure that all staff members have been duly informed of the rules requiring strict adherence with regard to principles, as well as management and handling, relating to Hitachi’ s personal information protection.

Initiatives in the workplace >>

〈All personal information〉

- Identification and classification of personal information
- Risk recognition, analysis, and countermeasures
- Record of personal information on log
- Periodic revision of personal information
- Appropriate handling
- Personal information protection education
- Personal information protection audits
- Confirmation of operational status in the workplace

Compliance with the “My Number” system

Hitachi strives for strict management and appropriate handling of personal information according to internal regulations related to Japan's “My Number” IDs (used for social security and tax purposes).

We have established a system to manage “My Number” IDs. By assessing risks of business operations associated with “My Number” IDs, we are taking appropriate measures against risks.

Personal information protection initiatives

Enhancing subcontractor management

There have been a number of information leakage accidents from subcontractors handling personal information in the past few years, which has become a social problem.

Hitachi enhanced its management of subcontractors handling personal information from an early stage, and has established internal regulations relating to the consignment of the handling of personal information, and subcontractors are supervised in accordance with these regulations.

An assessment and selection process is carried out based on subcontractor selection standards stipulated by Hitachi Group so that Hitachi selects subcontractors with personal information protection standards equivalent to or surpassing Hitachi's own standards.

Furthermore, consignment only occurs after an agreement has been signed which includes strict personal information management conditions such as the establishment of a system of management, and a basic prohibition of re-entrustment.

Supervision of the subcontractor will also be carried out, with a self-awareness of Hitachi as responsible as the prime contractor, in the form of periodic reassessments of the subcontractor, and the implementation of audits.

Hitachi Group overall initiatives (promotion of Privacy Mark acquisition)

Hitachi Group is engaged in the protection of personal information as a unified entity.

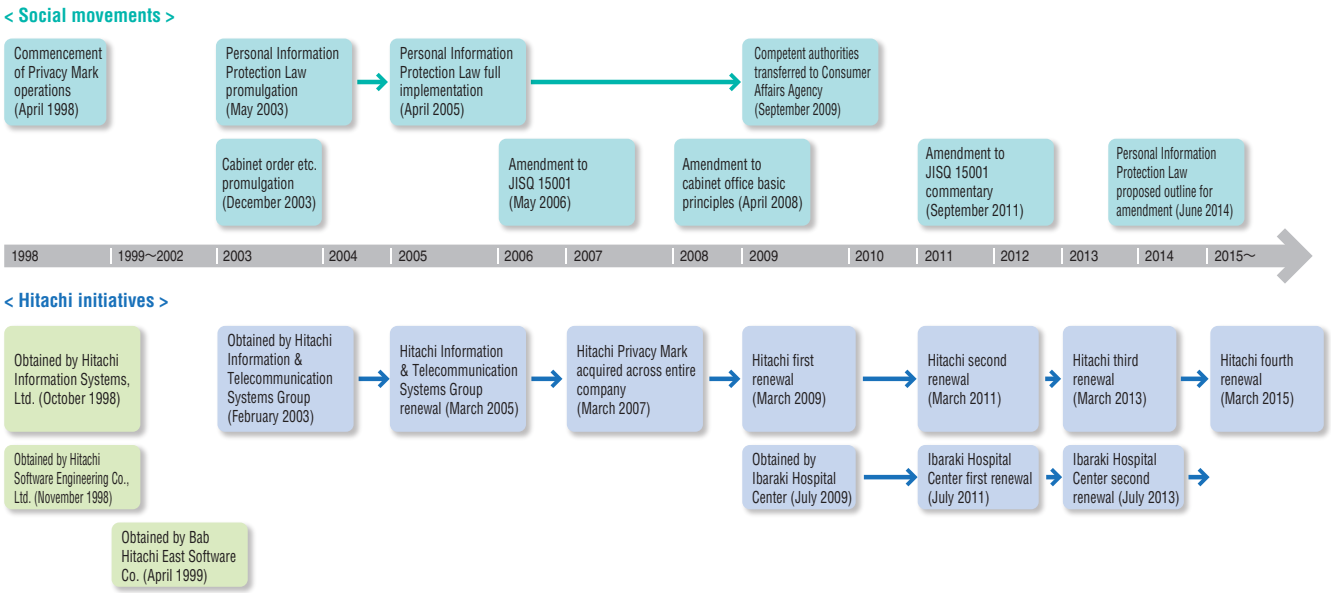
As of this date May 31, 2016, the Privacy Mark has been obtained by 57 vendors, which are protecting and handling personal information at a management level higher than the level required by the law.

Hitachi has also established the "Hitachi Group Privacy Mark Liaison Committee" which consists of mainly companies that have obtained the Privacy Mark, and implements periodic information exchange sessions, study sessions, and seminars to which external specialists are invited. Information sharing and research about personal information protection is also building up across the Group.

Medical facilities like hospitals are also engaged in the protection of personal information as independent vendors.

In July 2009, the Corporate Hospital Group in Japan also gained Privacy Mark certification. Hitachi is working hard to protect and carefully handle the personal information of its patients and others.

Hitachi Privacy Mark initiatives >>



Information security products and services initiatives

Information security products and services security assurance initiatives

Hitachi promotes activities that ensure the information security of products and services provided to customers. These activities are promoted in cooperation with Group Companies.

Information security initiatives

Hitachi has established the following security policies and three security clauses regarding products and services provided to customers, promoting intiatives to maintain information security. The Security Technology Commitee is at the center of these initiatives.

The committee formulates guidelines and plans security measures in order to maintain the quality of products and services from the aspect of information security, along with maintaining a grasp of information security technology trends.

●Security policies

The mission of a vendor who provides information security products and services is to provide a secure and reliable IT infrastructure, for a society that utilizes a wide variety of information at a high rate.

As a vendor of products and services as well as a user of Hitachi Group common IT platforms, its activities must properly maintain information security, and contribute to the security and value of every stakeholder, including customers.

●Three security clauses

(1) Establishment of security management systems

Establish the security management systems and improve them by undertaking regular reviews, in order to maintain the information security products and services and to ensure a quick, effective, and orderly response to information security incidents.

(2) Provision of secure products and services

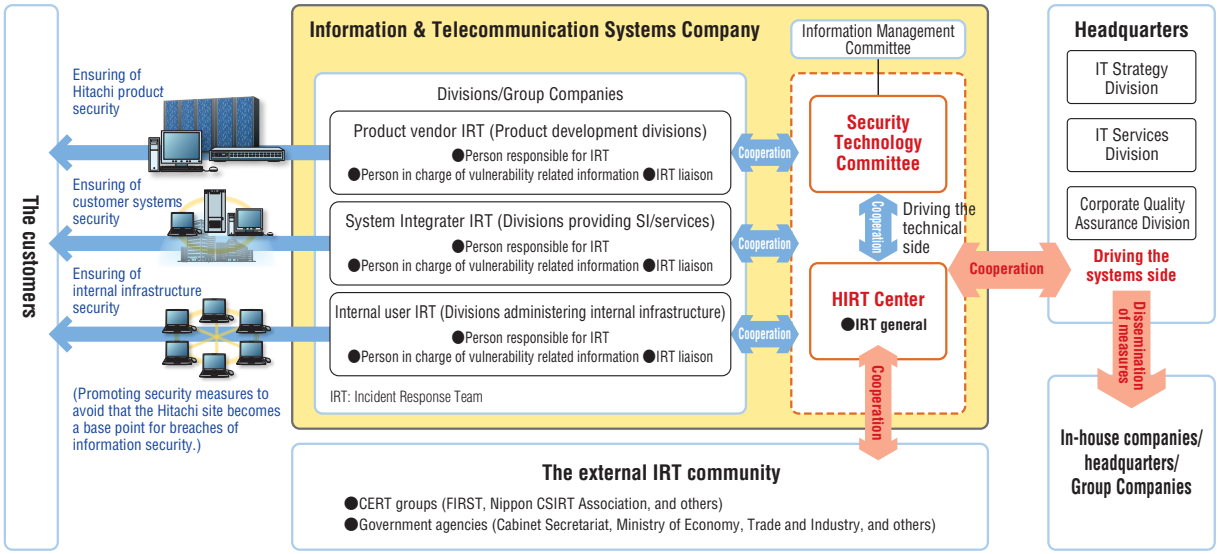
Design and implement the security functions and periodically undertake inspections of the products and services as well as their development and operation processes,s in order to provide secure information security products and services.

(3) Prompt response to security incidents

Monitor internal and external security incidents and properly respond to security incidents that have occurred and that are related to provided information security products and services

Provide the users with vulnerability-related information in order to prevent security incidents.

●System of promotion for FY 2015



HIRT: Hitachi Incident Response Team (organization for security incident/vulnerability countermeasures and response. Composed of Hitachi specialists.)
FIRST: Forum of Incident Response and Security Team

Information security products and services initiatives

Group Company activities

Group Companies that provide information security products and services have established organizations to ensure the security of supplied products and services. The following activities are being promoted.

(1) Web security

A division devoted to ensuring security quality for internal and external websites and systems has been established, and a division devoted to ensuring security quality for internal and external websites and systems has been established.

This division provides periodical diagnosis of the websites, the processes to approve the websites (application, consultation and implementation), and the preventive actions to ensure web security, as well as responding promptly to any web security incidents.

(2) System development security

Guidelines have been established for secure system development. In addition, tools which support the secure development, such as a security design checklist, vulnerability detection tool and other measures, are being utilized.

(3) Security education for engineers

In order to improve skills for engineers related to secure system development, education courses are provided, such as web application vulnerability prevention countermeasure courses, security courses for each developer language, and threat analysis courses.

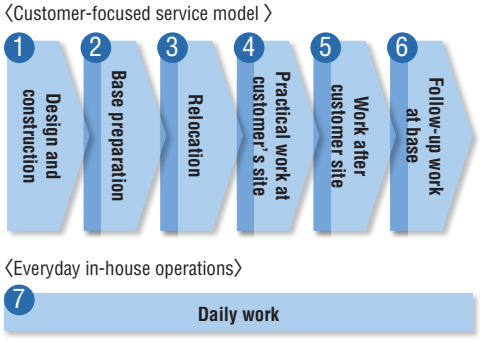
(4) System operation and maintenance services security

It is necessary to provide secure system operation and maintenance services in order to prevent the customer from breaches such as leakage of information assets, theft, destruction, manipulation, or unauthorized use.

For this reason, the process for providing systems operations and maintenance services has been clarified, and security standards that require actions necessary for each process have been provided and applied.

For example, for the process of design and construction, identification of information assets and their risks, and decision of security measures are required, and such requirements are fully disseminated in the organization. Traceability is also ensured for operations carried out at customer sites to replace faulty hard disk drives.

Business processes for provision of system operation and maintenance services >>



Information security products and services initiatives

Open Middleware Product security assurance initiatives

In recent years, the impact of software product vulnerability on social infrastructure has been growing steadily, and assurance of product security has become vital. From a global perspective, Hitachi Open Middleware Products, which play a central role in systems, have security assured at each phase from design and implementation to operation, so that the customer can use these products securely.

Security assurance initiatives

Many Open Middleware Products provided by Hitachi play a central role in social infrastructure, making security assurance vital.

It is the obligation of the vendor to provide products that the customer can trust, and from design and development to operation, it is important to build a framework which takes security into consideration across the entire life cycle of the software.

We have incorporated security assurance measures for conventional development processes when developing Open Middleware Products.

We have defined this as the “Secure Development Life Cycle of products” and are working to ensure a global standard of security while incorporating the approach of information security international evaluation criteria ISO/IEC 15408 (common criteria) and other standards.

Software development based on Secure Development Life Cycle of products

The following criteria have been established as important development processes in the “Secure Development Life Cycle of products”.

(1) Definition of requirements
Determination of overall policies regarding product security, and development policies for ensuring security.

(2) Design
Determination of security requirements based on threat analysis and the fleshing out of functional design that takes security into consideration.

(3) Implementation (Secure programming)
Identification of vulnerabilities by applying secure programming checklists and static analysis tools to source codes.

(4) Testing
Vulnerability detection with security testing tools (security scanners) and validation based on security checklists.

(5) Support
Prompt response to vulnerability issues in our products that are discovered after commencement of operations. Support by creation of patches and information disclosure to minimize customers' risk of exposure.

Hitachi is developing products with assured security by educating and sharing information with security developers and inspection supervisors on a continuous basis about trends in technology and vulnerability issues.

Approach for incident response to software product vulnerabilities

The basic approach is to eliminate software vulnerability issues in the design, implementation, and test phases. However, it is possible that there will be new vulnerabilities discovered, and new attack methods appearing.

Therefore, it is also necessary to consider a response for the operation phase of software products.

These initiatives also take into account the 2014 Ministry of Economy, Trade and Industry Public Notice Number 110 “Software Vulnerability Related Information Handling Measures” and the “Information Security Early Warning Partnership Guideline” , and stipulate the process from communication about a vulnerability issue to presenting a customer with a solution.

This framework is also coordinated with incident response activities (CSIRT) by “HIRT” *. Response to product vulnerability issues are done so in cooperation with affiliated institutions.

* HIRT：Hitachi Incident Response Team
CSIRT：Computer Security Incident Response Team

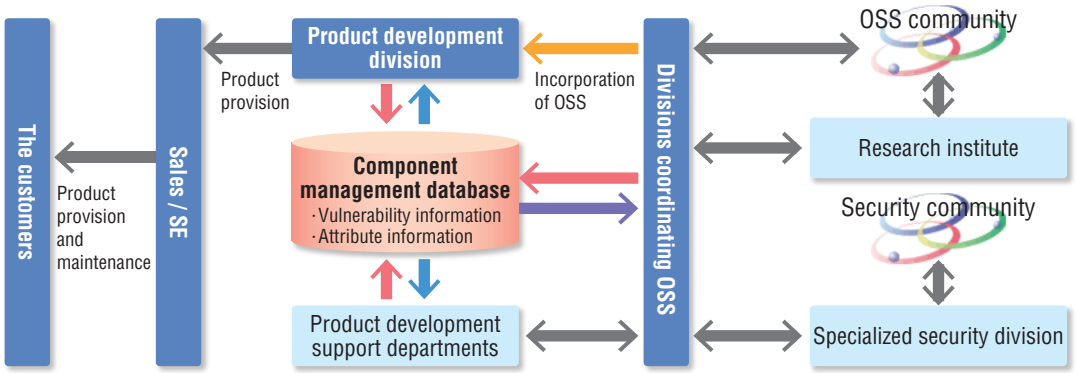
Information security products and services initiatives

Strategies for Open Source Software (OSS)

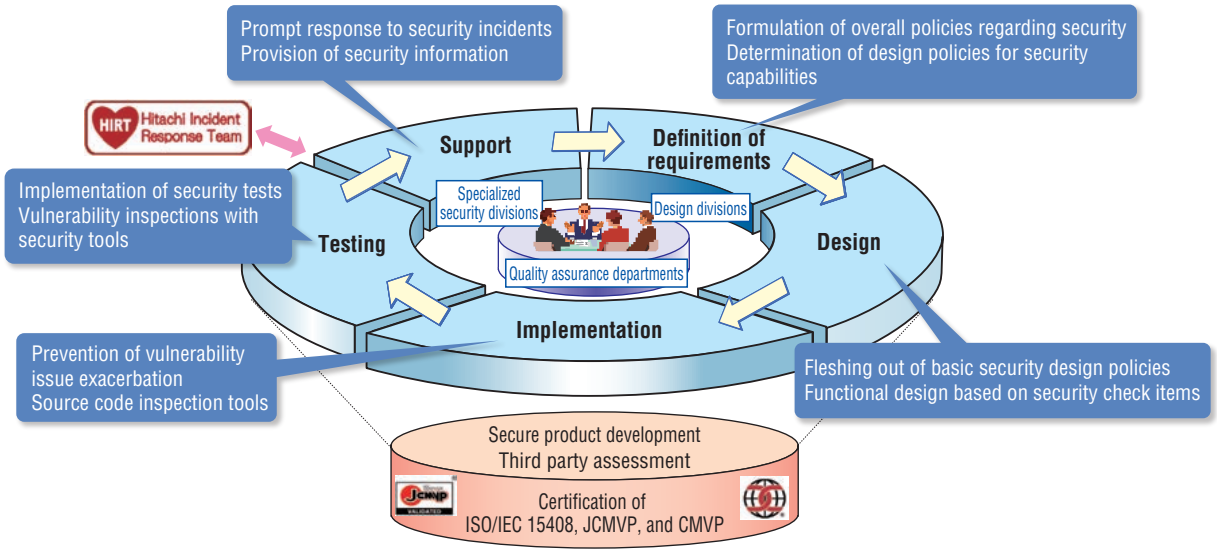
Examples of disclosure of vulnerability information in prominent OSS have become more prominent in recent years.

In order to deal with this, OSS information used in products is centrally managed, and initiatives have been put in place so that problem analysis, impact assessment, and selection of countermeasure policies can be carried out in a prompt manner.

OSS activity structure utilizing a component management database >>



Secure Development Life Cycle of Products Diagram >>



Application of third party assessment and certification systems

Initiatives in the “Secure Development Life Cycle of products” , namely, third party assessment and certification according to international security evaluation standard ISO/IEC 15408 are also incorporated as indicators objectively highlighting initiatives that ensure security, and the major Open Middleware Products HiRDB and Hitachi Command Suite have obtained these certifications.

This standard is also utilized in the “Standards for Information Security Measures for the Central Government Computer Systems” and other documents, as they are able to objectively highlight initiatives that “assure security” in product development.

By developing software based on the “Secure Development Life Cycle of Products” , it is possible to develop products that are on the same level as international standards like ISO/IEC 15408 (please refer to the “IT Security Certification” section in the “Third Party Assessment and Certification” for certified products.)

Reference information >>

■ISO/IEC 15408 information for Hitachi Open Middleware

http://www.hitachi.co.jp/Prod/comp/soft1/sec_cert/index.html

JCMVP (Japan Cryptographic Module Validation Program)

CMVP (Cryptographic Module Validation Program)

Information security products and services initiatives

Information security initiatives in cloud computing

Hitachi Cloud (Platform Resource Provisioning Services/Enterprise Cloud Services)
Hitachi is conducting various security initiatives relating to the cloud, a new form of IT provision and a part of social infrastructure, realizing a “safe and secure cloud” that is applicable to corporate information systems.

Cloud computing and security

IT, like electricity and water, is becoming common as “cloud computing” (“the cloud”) in which technology is used as a service, and does not require the user to possess any facilities or equipment.

In the cloud, not only are hardware and software maintained , but security measures are also carried out by service providers (cloud vendors), meaning the IT departments in user corporations can be freed from this task, and concentrate on constructing IT that will realize the core competencies of their own companies.

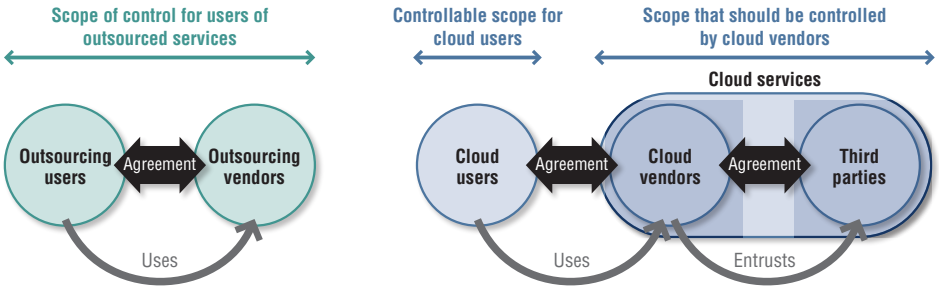
On the other hand, there are more than a few people who are concerned about problems like information leakage, as many different users share the same service provider environment.

Additionally, there is also the chance that the user will be put in danger of no longer knowing what content can be supervised or audited in the case of internal systems, for example compliance related to IT.

In this way, with the cloud, there is the necessity for information security corresponding to cloud-particular characteristics “sharing (resources with other users)”, and “using (vendor environments)”.

Furthermore, in the case that the cloud is used for only a portion of operational systems, assurance of information security to the same level as existing systems across all IT systems will be required.

Control scope differences between conventional consignment and the cloud>>



(a) Regular subcontracting　　(b) Using the cloud

Movements related to cloud computing information security

In response to this situation, guidelines and regulations for information security have been formulated regarding different sorts of industry groups and public bodies.

In particular, the proposal for international standards based on the guidelines of the Ministry of Economy, Trade and Industry, which was submitted by Japan's representatives to ISO/IEC SC 27, was standardized as ISO/IEC 27017 on December, 2015.

The leading ones are listed below.

The purpose for the promotion and spread of these, Hitachi is also an active member of the “Cloud Information Security Promotion Alliance” which was established with cloud vendors and auditors from the “Japan Information Security Audit Association”.

Title	Security Guidance for Critical Areas of Focus in Cloud Computing	Cloud Computing Risk Assessment	Information security management guidelines for use of cloud services	Guidelines for information security measures for ASP/SaaS	Handbook for safe use of cloud services for small to medium sized enterprises
Publisher	CSA (Cloud Security Alliance), a not for profit group from the USA, with participating members from IT vendors, cloud service vendors, etc.	ENISA (European Network and Information Security Agency), a European network information security bureau (An EU institution)	Ministry of Economy, Trade and Industry, Commerce and Information Policy Bureau, Office for IT Security Policy	Ministry of Internal Affairs and Communications “ASP/SaaS Information Security Countermeasure Research Society”	Information-technology Promotion Agency, Japan (IPA) Security Center
Intended reader	Cloud vendors, Cloud users	Cloud vendors	Cloud vendors, Cloud users	Cloud vendors	Cloud users (Particularly small and medium-size enterprises)
Outline	Main issues and advice about domains	Cloud risk and control	Checklist for when using the cloud, functions for preparation when providing	Organizational, operational, physical, and technological countermeasures	A checklist designed for small to medium sized enterprises

Information security products and services initiatives

Information security initiatives to achieve a “safe and secure cloud”

Hitachi Group has made “Hitachi Cloud” , a global unified brand in the cloud, and is working to address the realization of a “safe and secure cloud” for the services belonging to this brand, based on these sorts of trends.

Using one of Hitachi Cloud services, the “Platform Resource Provisioning Services” (IaaS), as an example, the previously stated CSA, ENISA, and Ministry of Economy, Trade and Industry guidelines are used in a cross-sectoral manner, and checklists from the point of the service user and provider have been created relating to the IaaS/PaaS/SaaS service layer.

Necessary measures and procedures are being created and promoted based on the characteristics of each guideline, covering a variety of information security perspectives, through the implementation of systematic self-checks.

In particular, guidelines relating to each of the 13 domains indicated in CSA Ver. 3.0[*1] have had clarified for equivalent services, and different measures are being carried out in order to achieve those guidelines.

To give one example, in the “compliance and auditing” domain, it is necessary to implement services and audits with strict adherence to customer compliance stipulations even for cloud services.

The “Platform Resource Provisioning Services” provides guidance to be able to carry out thorough compliance for processing in the cloud in the, equivalent to customer internal compliances.

Measures to achieve these guidelines like compliance-related reporting and auditing methods are stipulated in an agreement with the customer, so that the customer can verify whether compliance is being followed.

White papers[*2] that describe these initiatives have been made widely available.

Because standards relating to information security differ depending on the industry, organization of measures as they relate to the key criteria for each industry are also being promoted.

To give one example from the public sector which includes public authorities and local governments, the National center of Incident readiness and Strategy for Cybersecurity (the NISC) has published the “Unified Standards for Government Agency Information Security Countermeasures (2014 edition)” [*3], establishing criteria for administrative bodies.

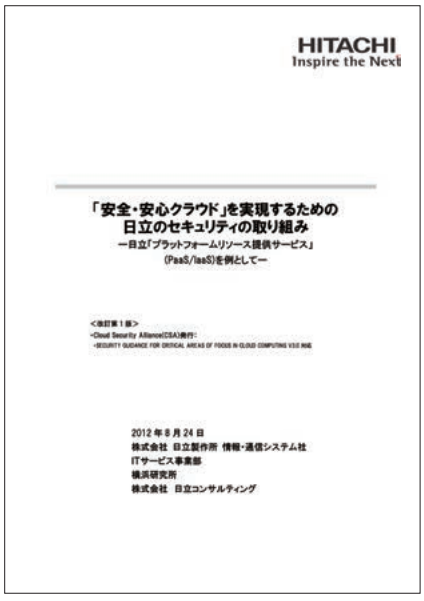
Requirements relating to the application of cloud services to the public sector have been isolated, and information security enhancement reflecting services has been planned.

The details of this have also been made widely available in the “public edition” white paper[*4].

The vast business knowledge about information security that Hitachi has accumulated in product and SI business is being utilized in Hitachi Cloud. Hitachi will also continuously address initiatives to achieve a cloud that customers can use with peace of mind, based on trends in industry groups and standardization.

*1 Cloud security alliance: Security guidance for critical areas of focus in cloud computing V3.0
https://cloudsecurityalliance.org/ (November 2011)
*3 National center of Incident readiness and Strategy for Cybersecurity (the NISC): Unified Standards for Government Agency Information Security Countermeasures (2014 edition) http://www.nisc.go.jp/active/general/kijun26.html
*2, *4 Hitachi: Information security initiatives to achieve a “safe and secure cloud”
- Example of Hitachi “platform resource provisioning services” (PaaS/IaaS)
- Example of Hitachi “platform resource provisioning services” (PaaS/IaaS) for government office
http://www.hitachi.co.jp/cloud/download/index.html

White Paper >>



Information security initiatives to achieve a “safe and secure cloud”
- “Hitachi cloud platform resource provisioning services”
An example with PaaS/IaaS -

< Updated edition number 1 >
Corresponding to “Security Guidance for critical areas of focus in cloud computing V3.0”(Cloud Security Alliance)
August 24, 2012

Hitachi, Ltd.
Information & Telecommunication Systems Company
IT Service Division
Yokohama Research Laboratory
Hitachi Consulting Co., Ltd.

* Published only in Japanese

Information security products and services initiatives

Big data business privacy protection initiatives

While there is a large amount of interest in big data accompanying advances in information communications technology in recent years, concerns about big data privacy risks have also been highlighted. Hitachi is constructing a framework for the protection of privacy from the perspective that when services supporting the use and application of big data are developed, Hitachi assure client safety and security.

Big data and privacy

Big data is data that is characterized by the so-called "3 V' s" - volume, variety, and velocity, and is also a generic name for new technology that processes such data.

Data with volume and variety has started to accumulate with the spread of social networking services, smartphones, and IC card electronic managers, and with the development of the cloud and of parallel and distributed technology, it is now possible to analyze data at high speeds. Opportunities to analyze accumulated big data and to apply this to business are increasing rapidly.

While expectations exist regarding these opportunities, privacy concerns in use of big data have also been emphasized.

In fact, there have been many instances of privacy breaches when a company has tried to utilize big data, both in Japan and overseas.

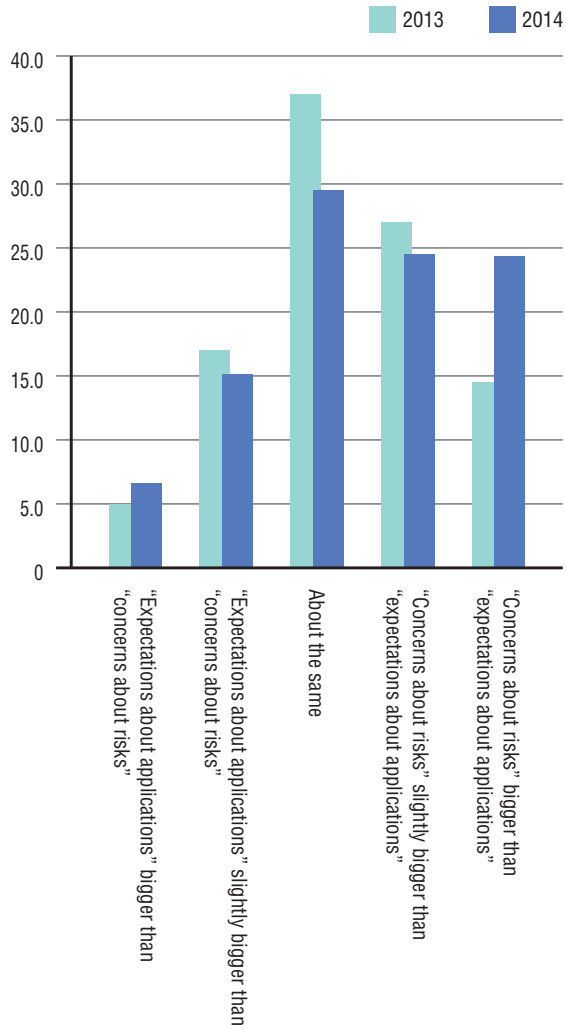
For example, there have been cases in which a privacy breach has been caused as specific individuals were identifiable by the analysis of big data that was not considered to contain any personal information.

According to the survey that Hitachi conducted with Hakuhodo Inc. in August 2014, the "Second Attitude Survey regarding Lifestyle Information handled as Big Data" *1, compared to the same survey from the previous year, the ratio of consumers who responded "expectations are about the same" regarding utilization of consumer information had dropped, and the ratio of consumer responses "expectations are bigger/slightly bigger than concerns" (21.7%), and "concerns are bigger/slightly bigger than expectations" (48.8%) had increased, meaning there is an increased ratio of consumers who feel particularly concerned (see diagram).

Because the opportunity to hear the word "Big data" with both meaning has increased, but particularly concerns, are experiencing increased interest, and we can conclude that needs relating to privacy protection are increasing at a fast pace.

Thus, it is necessary to implement appropriate measures for privacy protection with an understanding of the privacy risks characteristic of big data, in order to promote the safe and secure use of big data while protecting personal privacy.

*1 http://www.hitachi.co.jp/New/cnews/month/2014/08/0804.html



Information security products and services initiatives

Big data business privacy protection initiatives

Data handled in big data business includes various types of information related to individuals.

Personal information is included among this, and there is also information included that could lead to a privacy breach even though it is not considered personal information.

We have implemented the following measures in our big data business practices in addition to conventional personal information protection measures, in order to protect privacy.

●Privacy governance

We have constructed organizations and systems for the protection of privacy, as well as stipulated privacy protection policies, in order to establish governance for privacy protection when handling big data, which employees must adhere to strictly.

We make information about Hitachi' s privacy protection initiatives available to our customers, and continuously strive to improve these initiatives.

●Privacy impact assessment

We have implemented the Privacy Impact Assessment (PIA) for the protection of privacy when handling big data, besides of compliance of law.

Specifically, we use a system by which the person in charge of a big data project that handles data that might cause a privacy breach assesses privacy risk based on a checklist in advance of project commencement.

This assessor is able to access advice from specialized departments with knowledge of privacy including trends and legal systems on the occasion of conducting an assessment.

The relevant project will commence once the risk of a privacy breach has been verified as sufficiently low according to the results of the assessment.

●Privacy protection education

It is necessary for staff members to have a correct understanding about privacy, and that each and every staff member protects privacy, in order to achieve both appropriate privacy protection and the utilization of big data.

To securely implement the Privacy Impact Assessment, Hitachi educates staff members about privacy protection by using case studies.

In addition, Hitachi, including divisions that handle big data and Group Companies, holds regular study and reviews sessions about privacy.

Furthermore, Hitachi investigates new measures for privacy protection, in addition to sharing information about business and system trends on a daily basis.

Aiming for the realization of service customers can use with peace of mind

Privacy protection in big data is a very new topic, and currently, legal and technical aspects of big data are being discussed.

In addition to expanding initiatives like the ones stated above, aiming for the realization of service customers can use with peace of mind, we will also reflect an understanding of domestic and international legal systems and changes in technology in our services now and in the future, in a timely and appropriate manner.

Information security products and services initiatives

Information security human resources development initiatives

Hitachi Group has trained highly-skilled security human resources and human resources who can bridge security technologies to customers, by evaluating security related skills and careers, by conducting technical training and management education so that customers can securely use products and services.

Overview of information security HR development activities

Due to intensified cyber attacks on social infrastructure, Hitachi Group ① scouts and evaluates, ② develops and utilizes, ③ shares and links the security human resources who can handle these attacks, and promotes activities for developing information security human resources, thereby contributing to ensuring the security of the social infrastructure.

Through these activities, we focus on the following persons as information security human resources: highly-skilled specialists in information security, and also IT engineers involved in the development and operation of systems on-site, and on internal IT users.

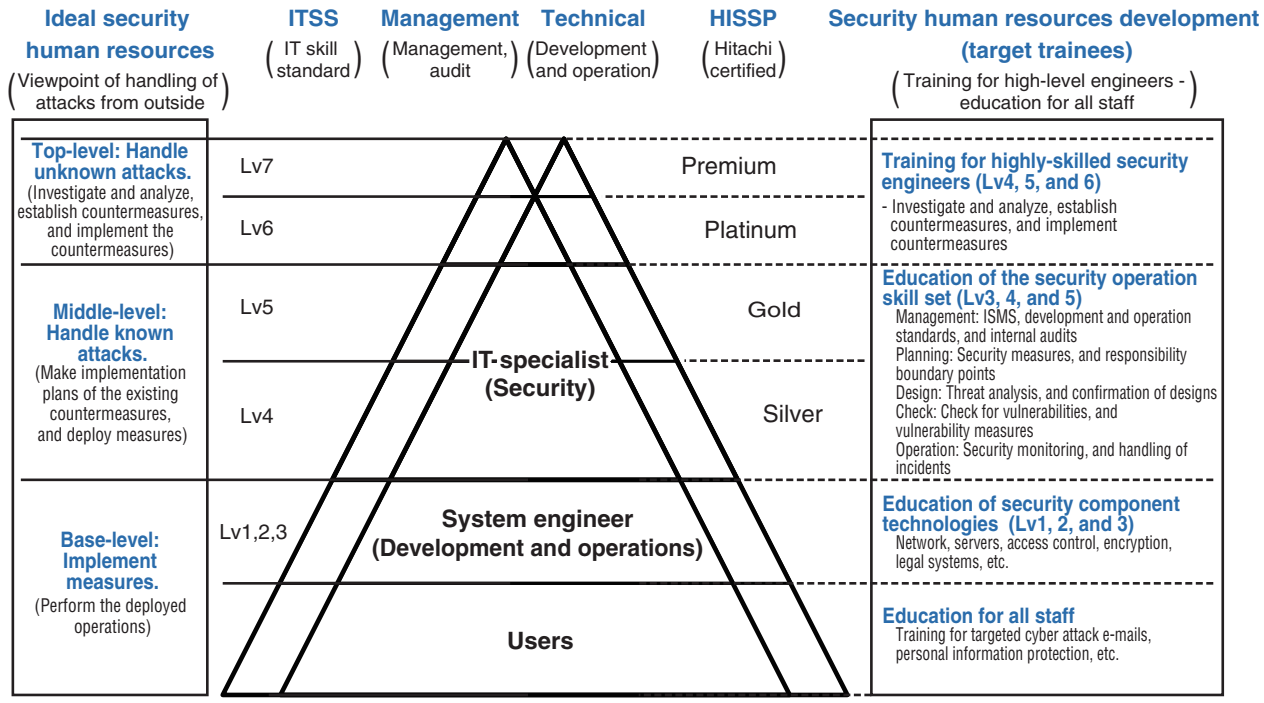
These activities are based on ITSS (Information Technology Skill Standard), which is defined by the Ministry of Economy, Trade and Industry and which clarifies and systematizes IT-related capabilities. We categorize the ideal human resources who systematically handle cyber attacks into the following three classes, and conduct the education and exercises that are required for each layer:

① Highly-skilled security human resources
Top-level human resources who can investigate and analyze unknown attacks and establish and implement countermeasures.

② Security human resources who organize system development and operation
Middle-level human resources who can make plans to implement existing countermeasures against known attacks, and who can deploy measures in the development and operation of information systems.

③ Human resources who implement deployed security measures
Base-level human resources who investigate the systems they are responsible for, and who implement measures based on alerts issued by the top-level human resources and on instructions from the middle-level human resources.

Diagram 1 Information security HR development activities >>



*ITSS: Information Technology Skill Standard HISSP: Hitachi Certified Information Security Specialist

Information security products and services initiatives

Scouting and evaluating of information security human resources

Hitachi Group has established the category of “Hitachi Certified IT Professional” , which conforms to the company certification system, which has been based on the system for Certified IT Professionals of the Information Processing Society of Japan since August, 2014. Hitachi Group started scouting and evaluating information security human resources as Hitachi Certified Information Security Specialists (HISSP).

This certification system defines certification criteria that include whether public qualifications are held, actual experience in the Hitachi Group, and contribution to society (public relation activity), and evaluates the skills and careers by using four levels (Premium, Platinum, Gold, and Silver). Hitachi Group examines certifications with the goal of having 1,000 certified persons by 2020.

Diagram 2 Viewpoints of examination for HISSP certification, and certification levels >>

■Viewpoints of examination (HISSP requirements)

✓ Whether the person has the identity, originality, and productivity of a professional.

✓ Whether the person has the skills and career with which he or she can act voluntarily and efficiently with a sense of responsibility when developing security or handling incidents.

■Certification levels (HISSP classes)

[HISSP Silver]

Information technology engineer who is responsible for the information security of each project

[HISSP Gold]

Information security engineer who represents the business or organization

[HISSP Platinum]

Information security engineer who represents the information communication field

[HISSP Premium]

Information security engineer who Hitachi is proud of

Information security products and services initiatives

Developing and utilizing information security human resources

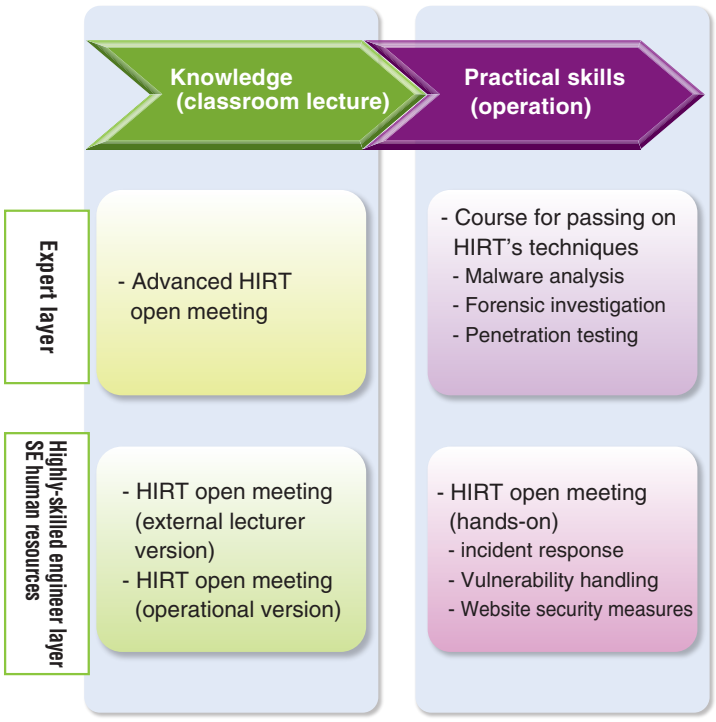
●Training for highly-skilled (top-level) security human resources

To handle more sophisticated cyber attacks, we have established an Incident Response Team (IRT) for each business division, and have assigned highly-skilled security engineers who have high security skills.

Highly-skilled security engineers basically need to improve their skills by themselves. The Hitachi Incident Response Team (HIRT), however, provides places for exchanging information between engineers and for developing practical skills and abilities.

1) Advanced HIRT open meeting
Place for exchanging information about security issues that engineers find difficult to discuss in an open place.
2) Course for passing HIRT's techniques
Place for passing on techniques for cyber security countermeasures such as malware analysis, forensic investigation, and penetration testing.
Place for obtaining know-how on specialized security techniques such as malware analysis, forensic investigation, and penetration assessment technology.
3) HIRT open meeting (hands-on)
Place for using actual machines to develop practical abilities: for example, to learn how to specify server settings and network settings in order to learn how to handle attacks that target new vulnerabilities.
4) HIRT open meeting (external lecturer version)
Place for inviting external lecturers to share security information from the outside world.
5) HIRT open meeting (operational version)
Place for acquiring knowledge required to manage the IRT organization of each business division.

Diagram 3 Training for high-level (top-level) security human resources >>



Information security products and services initiatives

●Development of security (middle-level) human resources for the system development and operation

Together with promoting highly-skilled security human resources, we also conduct education for system engineers who provide products and services for customers. This education conforms to the secure system development and operation management standards for assuring security quality.

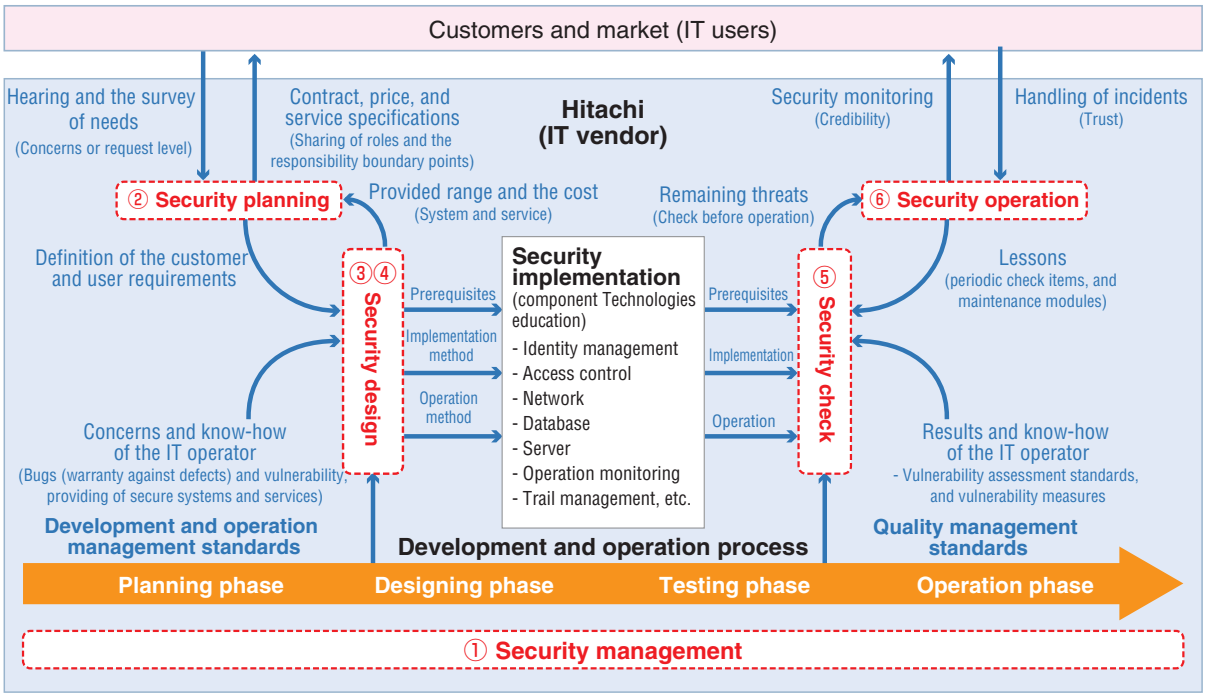
In this training, engineers can learn the skill set (① to ⑥) of the required rules, standards, procedures, component technologies, and know-how, for each development and operation process.

This training teaches how to build in security at the planning and design phases, and how to handle incidents at the installation and operation phases.

Through this training, we have developed middle-level human resources who can bridge the gap between highly-skilled security human resources and customers, and can implement countermeasures and handle security issues against cyber attacks.

Note that we have been conducting education for all staff regarding targeted cyber attack e-mail training as IT users, and personal information protection. For developers, we have been conducting education on component technologies for implementing security.

Diagram 4 Skill set education for secure system development and operation >>



To enable customers to use products and secure and safety

Hitachi has been developing security human resources by ① using the certification system to scout and evaluate security human resources, ② using training in high-level security techniques and the skill set education to improve their levels, and ③ using the security community, so that customers can secure and safety use products and services.

Physical security products and services initiatives

Initiatives to enhance security for physical security products and services

Hitachi offers ① monitoring screen integrated management systems, ② integrated room entrance/exit management systems, ③ finger vein verification identity management, and ④ around-the-clock remote surveillance and support systems services as products and services designed for office and factory physical security. Hitachi is also working to enhance physical security solutions for monitoring the flow of people, things, and information.

Background of physical security enhancement

(1) Information security and physical security

The digitalization of corporate and customer information is moving forward with the spread of IT, and there is increased risk of information leaks associated with the networking of operational systems.

It is necessary to enhance information security in order to decrease these risks.

As part of this, there is also an increased necessity for physical security, such as entrance restrictions to rooms where information is being stored, surveillance of internal images of important facilities, and access management for lockers, safes and other locations.

It is important to designate the appropriate security level upon clarifying the place and items to be protected, and to construct a system that corresponds to that level, when implementing physical security in office buildings and plants.

(2) Requirements for physical security in office buildings

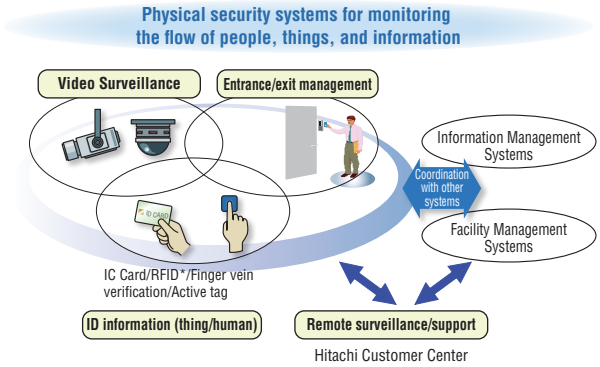
Entrance/exit management systems for buildings or rooms as well as monitoring systems by way of cameras installed in areas where people enter or exit buildings, are already in existence as examples of physical security systems for office buildings.

It is important to combine entrance/exit management systems with individual verification technology like IC cards or finger vein verification corresponding to the security level necessary for each area in a building.

Coordination with information management systems, which use authentication results in the access management of PC and work systems and for authentication when printing documents, as well as the coordination with facilities management systems, like restricting the destination floor of an elevator based on authentication results, are also requirements.

In addition to physical security objectives, in recent years initiatives to use less energy, like coordinating entrance/exit management systems and facility management systems to control air conditioning and lighting, have also become important.

Furthermore, there is also a need for companies that have multiple operations bases to standardize security levels across each location, and provide central management from a supervisory department.



* RFID: Radio Frequency IDentification

Physical security products and services initiatives

Security enhancement- concept and products/services

In order to assure physical security in offices, it is necessary to construct a system to monitor and control the flow of people, things and information, combining video surveillance systems with cameras and entrance/exit management systems with individual verification and ID information management technology in an appropriate manner, and where necessary planning coordinated operation of information and facility management systems.

Furthermore, central management is also important, standardizing security levels across multiple locations utilizing a network.

We provide products and services with features such as the following to solve physical security, based on these ideas.

(1) Video surveillance

Conventional analog cameras have been used commonly for video surveillance in office buildings, however in recent years network cameras that utilize IP networks are becoming increasingly common.

Hitachi Infrastructure System Company provides low installation cost high performance video surveillance systems, focusing primarily on hybrid recorders that can use both network cameras and analog cameras.

Furthermore, they also offer monitoring video integrated management systems that can centrally manage live footage and playback video from multiple locations.

(2) Entrance/exit management

Hitachi entrance/exit management systems can offer entrance/exit management appropriate to the operating environment, by combining different types of non-contact IC cards, finger vein technology, and similar.

Function and data usage restrictions and reader restrictions can also be easily set even for systems that have been brought in with the unit base as a building or a corporate group.

With to the standardization of security policies, corporations that have to manage multiple locations can easily give access permission for all locations with a single card, restrict entrance/exit depending on authority, or program systems in other ways.

Systems can be easily installed and operated through easy operation on an Internet browser.

Services are also offered on a cloud bases, in which the server is not located at any business location, making it easier for small to medium sized enterprises to install systems.

It is also possible to coordinate with facility management systems, meaning the customer can use systems for not just security, but also energy reduction.

(3) Verification and ID information management

In addition to different types of non-contact IC cards, Hitachi offers a rich variety of verification methods, including a seal tag that can be added to ID for verification by sticking on to existing cards, acting tags for hands-free which makes wireless individual verification possible, and finger vein verification which guarantees robust security based on finger vein pattern data unique to all individuals.

(4) Remote surveillance/support structures

The Hitachi customer service center, with 350 locations across the country, supports customer security related systems and facility management systems coordinated with these systems with safe operation and the provision of emergency response, with a 24-hour 365-day surveillance structure.

With these sorts of features, our physical security products and services achieve enhanced total solutions that protect assets in sites like buildings, offices and plants.

Control products and systems initiatives

Initiatives to ensure information security in control products and systems

Connection and coordination of control systems that support important infrastructure with information communications systems has moved forwards recent years, and information security risks starting with cyber attacks are heightened. Systems even more secure than present systems and rigorous management of customer confidential information is necessary for the uninterrupted and safe system management. Hitachi, Ltd. is working on solutions for these sorts of problems.

Background and goals

Information control systems, which form the center of control systems that make up the base of social infrastructure, must operate on a 24-hour basis as prerequisite, with a high level of reliability.

Information security is related to safety, and the uninterrupted and safe operation of information control systems is possible through the appropriate management, maintenance, and operation of information assets, in particular the reliable maintenance customer related information confidentiality.

In order to fulfil these demands, information control systems maintain information security against threats from the outside, in principal by physically blocking other systems.

At the same time, under the national IT strategy of “a society in which anybody can freely access information” , measures such as “information cooperation infrastructure development” have been implemented.

Security threats relating to information control systems are diversifying in this environment of change, and the role of information security technology in information control systems will become increasingly bigger in from now.

There are many instances in which important customer information is incorporated for system development, and these sorts of information leaks are a direct threat to social infrastructure.

The initiatives of the Control System Platform Division of Hitachi, Ltd. concerning these issues are stated below.

Management of customer confidential information and organization of development processes

●Establishment of Information Security Management System (ISMS)

Hitachi, Ltd. provides information control system solutions that support social infrastructure and the foundation of industry (such as electricity, traffic, steel, water, industry, and power electronics), and these require organizational information security management.

Maintenance of confidentiality for customer information and results configured from that information are of particular importance.

To respond to these demands, the Control System Platform Division constructed an ISMS based on the International Standards Information Security Management System (ISMS) (ISO/IEC 27001: 2005) under the direction of top management. In January 2010, the division completed acquisition of certification.

ISMS certification has been maintained continuously from this time.

Currently, Infrastructure System Company is in the process of amending its ISMS according to the ISMS International Standards amendment (ISO/IEC 27001: 2013).

●Formation of security aware product development processes

The following development processes were formulated in 2005, and have been applied to system development.

(1) Evaluate security risk at the beginning of the development process.
(2) Verify security risk settings in the design review stage (protection settings, countermeasure policies).
(3) Confirm security requirements with a security verification tool or similar before shipping from plants and before handing over to customer.

However, security risk for control systems is increasing, and with corresponding trends like “acceleration of international standards and certification” and “customer demand for control vendors to acquire security verification” , the environment surrounding control systems is constantly changing.

Hitachi, Ltd. has responded to this situation by cooperating with domestic and international organizations like the Control System Security Center which commenced in 2012.

Regarding strategies for international standards, requirements for standards for different domains like the IEC 62443, NERC CIP (North American electric standards), and WIB (European industrial standards) have been investigated, and conditions requiring strict adherence have been formulated as security standards, and turned into guidelines.

Control products and systems initiatives

Control systems security

●Approach and bigger picture of control systems security

Control system vulnerability against cyber attacks has become more tangible domestically and overseas in recent years with the appearance of Stuxnet, malware that targets control systems.

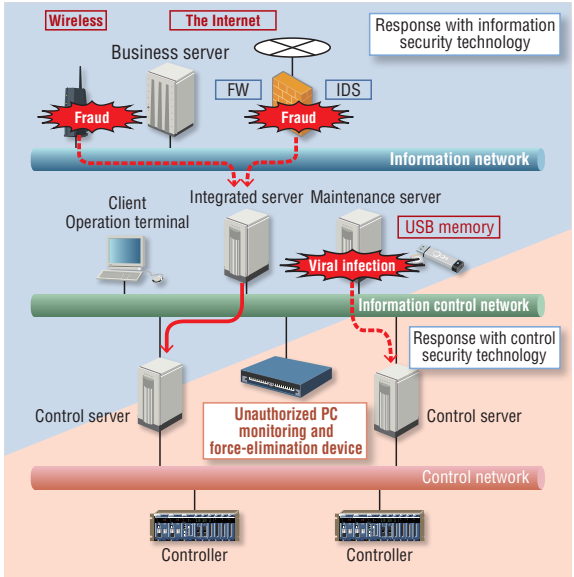
Formulation of international control system security standards have been accelerated in the USA and Europe in order to deal with this, and requirements for acquisition of international verification are moving forwards.

At the same time, the certification scheme ISASecure® EDSA (Embedded Device Security Assurance) has also commenced in Japan, which provides security verification for control equipment, centering on technology research association control system security centers.

Information control systems consist of a variety of intermixed systems, such as controllers, control servers, information servers, and database systems, in order to make ideal system structures for the operation of different types of functional systems.

Because of this, it is necessary to have not just information security products like FW (firewall) and IDS (intrusion detection systems), but to combine these information control network security products with control security components corresponding to international standards and certification, in order to ensure and maintain security levels corresponding to cyber attacks on information control systems.

Example of application in control systems >>



●Control security components

ISASecure® EDSA certification is a certification system guaranteeing security of control components operated by ISA security conforming associations. Criteria requiring assessment are defined for each assessed level indicating strength of security.

The controller “HISEC04/R900E” satisfied these criteria, and acquired ISASecure® EDSA certification in 2014.

The Infrastructure System Company will continue to develop and provide control products with a high level of security.

EDSA certification assessment criteria and levels >>

Assessment criteria	Content	Assessment level (number of assessment criteria)		
		LVL1	LVL2	LVL3
CRT	Communication Robustness Testing	69	69	69
FSA	Functional Security Assessment	21	50	83
SDSA	Software Development Security Assessment	129	148	169

CRT: Communication Robustness Testing FSA: Functional Security Assessment
SDSA: Software Development Security Assessment

●Security products for information control networks

Control systems are often operated for long periods of time, and systems sometimes contain a mix of both new and old devices as devices are renewed after start of system operations.

Because of this, in order to maintain security levels of systems overall, it is effective to not just introduce security supported devices, but in addition to FW and IDS that block intrusion of attacks from outside, to also monitor change in device configuration and block connections to unnecessary components.

Hitachi Group PC surveillance and force-elimination devices constantly monitor networks, and are able to discover suspicious devices, meaning results can be expected in security assurance for information control systems.

●Security assurance from a system operation perspective

Security countermeasures from an operational perspective, like password management and entrance/exit management, are also a necessary part of information control systems.

These countermeasures are basically carried out principally by operators, and as a systems vendor, we offer solutions ideal for customer issues.

Research and development supporting product and service security

Security research and development for a safe, secure and comfortable society

Security technology that can handle ever-changing risks is necessary for the realization of more advanced social infrastructure systems which utilize information and communication technology. We provide the world with products and services that are both reliable and secure, as well as convenient, and are also researching and developing cutting edge security technology in order to achieve a society in which people can live with peace of mind.

Security research and development initiatives

Along with the normalization, development and usage expansion of information and communications technology, security is being applied to various business domains as a standard technology.

Hitachi is aware that security technology is vital to social infrastructure systems and corporate information systems, and has been researching and developing approaches that protect systems with prior security designing since the 1980s, with the three pillars of “cryptography”, “authentication”, and “assessment”.

However, in recent years many problems have become a reality that cannot be addressed with security design alone.

Examples of these problems include more sophisticated cyber attacks represented by targeted cyber attacks, new software component vulnerabilities being discovered on a daily basis, the rapid increase in internet banking fraud victims, the issue of anonymizing information and protecting privacy when utilizing big data, and protecting IoT field devices.

A new approach is necessary to deal with these sorts of new issues in addition to conventional technology, achieve both effective and accurate responses after an attack, and to balance concealing and analyzing.

Hitachi is researching and developing the world’s most advanced security technology which can respond to a variety of threats which are getting more sophisticated on a daily basis, aware that it is Hitachi’s responsibility to be the leader in social infrastructure business, in order to achieve a safe society in which people can live with secure and comfortable lives.

Development of technology to process secret information

Services that utilize the cloud have been gaining a lot of attention in recent years, yet there is a lot of user anxiety regarding cloud security, and users are avoiding moving business that includes the handling of highly confidential data to the cloud.

The risk of information being leaked to a third party including the cloud manager has become a problem, as even if data is stored in the cloud in an encrypted state, in order to search for or check information on the cloud, that information must be temporarily decrypted.

Hitachi has developed searchable encryption technology, which allows information to be searched while still encrypted in the cloud, and searching even large amounts of data while maintaining a high level of security is now possible.

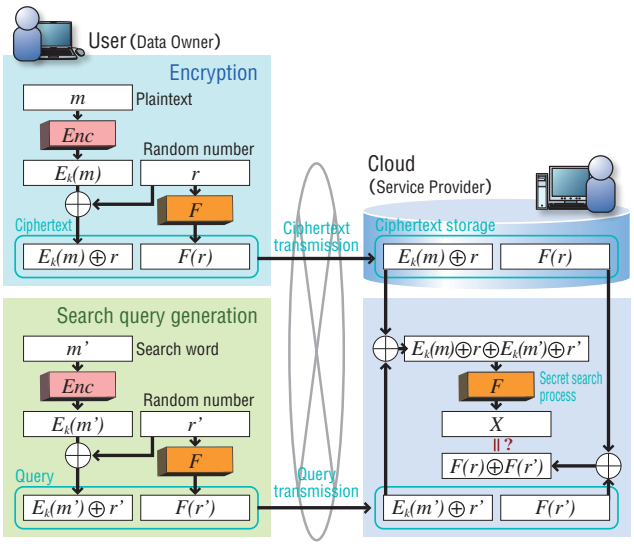
Conventional encryption methods had safety concerns. If the same information was encrypted multiple times, there would be a one-to-one relationship with the encrypted text. With this new technology, random numbers that change every time are used so even if the same data is searched for, it will be turned into completely different ciphertext, increasing randomization.

Additionally, by using symmetric key algorithms which make high speed processing possible, large amounts of data can be searched effectively by minimizing encryption processing overheads.

This technology was applied to the Remudy WEB patient information registration system, developed jointly by the National Center of Neurology and Psychiatry and Hitachi Solutions Ltd. in 2014, and as such became the world’s first practically implemented processing technology for secret information.

Hitachi aims to continue to provide services that will not only promote the use of this technology in the field of medical health care, but also as an all-purpose security solution that can be applied to the public cloud.

Searchable encryption data flow >>



Research and development supporting product and service security

Development of dynamic malware analysis technology for targeted cyber attacks

It is said that in recent years approximately half of the new types of malware that are used for cyber attacks are not able to be detected by antivirus software.

Because of this, the number of case where existing measures have failed to detect attacks and allowed incursions into the organization has increased.

There is a pressing need to analyze malware characteristics and prevent the spread of damage in order to counter these types of malware.

Currently malware characteristics are identified by running the malware in a special analytical environment and observing its behavior, however recently types of malware that avoid analysis in analytical environments by restricting execution environment have been growing more common.

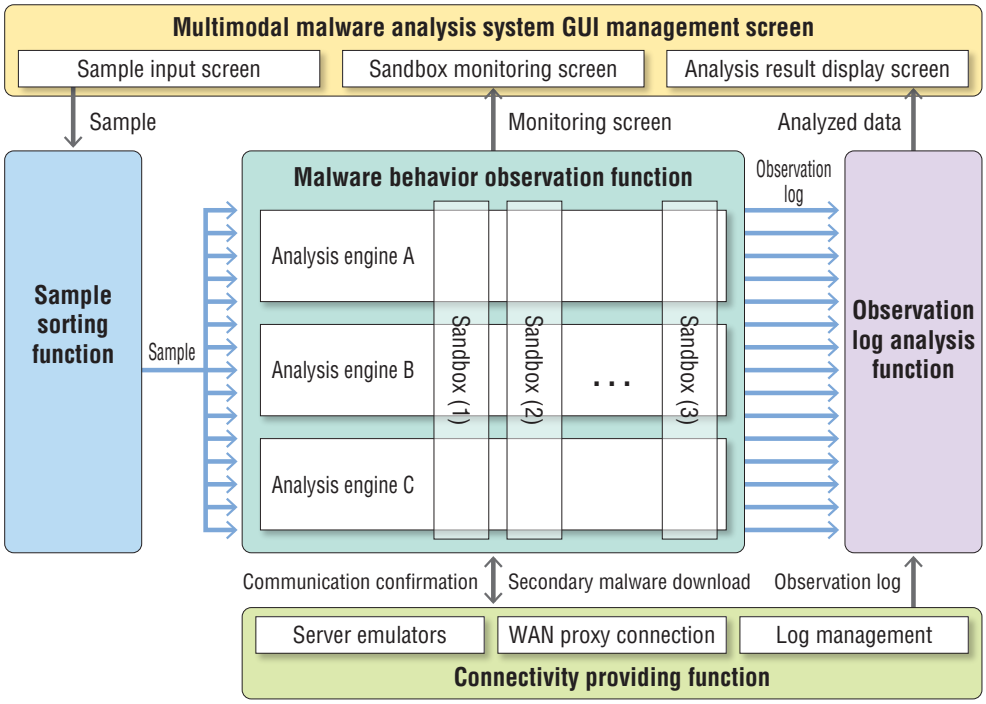
In this context, Hitachi is researching and developing dynamic malware analysis technology which analyses malware from various perspectives in a variety of different analytical environments.

Technology that automatically extracts malware behavior from observation results, achieved by scripting business knowledge of malware analysis, is also being developed.

Easy analysis of suspicious activities by malware like network connections and more can be easily analyzed with this technology, and will be able to be connected to countermeasures implemented after invasion by malware.

By incorporating this technology into organization information system divisions and SOCs (security operation centers), not only can costs associated with the work of a specialist to analyze the malware be greatly reduced, organizations without a specialist will also be able to easily clarify malware threats, which will be a useful countermeasure against incidents.

Overview of dynamic malware analysis technology >>



Research and development supporting product and service security

Development of security risk assessment technology for handling of disclosed critical vulnerabilities

Disclosures of vulnerability information, records of security defects in software and other products, are increasing every year, with approximately 8,000 cases of vulnerability information disclosure in 2014 according to public authority for IT security (like NIST in the USA).

Of these, Heartbleed, a vulnerability in OpenSSL, attracted a high amount of interest, as directly after its disclosure there was a sharp rise in attacks targeted at that vulnerability, and it became necessary for System administration division in corporate to respond in a prompt manner.

In these sorts of situations, identification or urgency of vulnerabilities that require a response becomes necessary, demanding a high level of information security skills.

However, it is difficult for each organization to secure and develop these sorts of specialists.

This is why at Hitachi, we have developed technology that will analyze cyber threat penetration routes and order vulnerabilities that require a response on a priority basis, as well as identify system vulnerabilities in a prompt manner.

This technology can automatically identify the existence of vulnerabilities by comparing software information obtained from equipment and disclosed vulnerability information.

Furthermore, the level of each vulnerability risk in a system is dependent on the likelihood and ease of a cyber attack reaching equipment with a vulnerability, and the degree of impact.

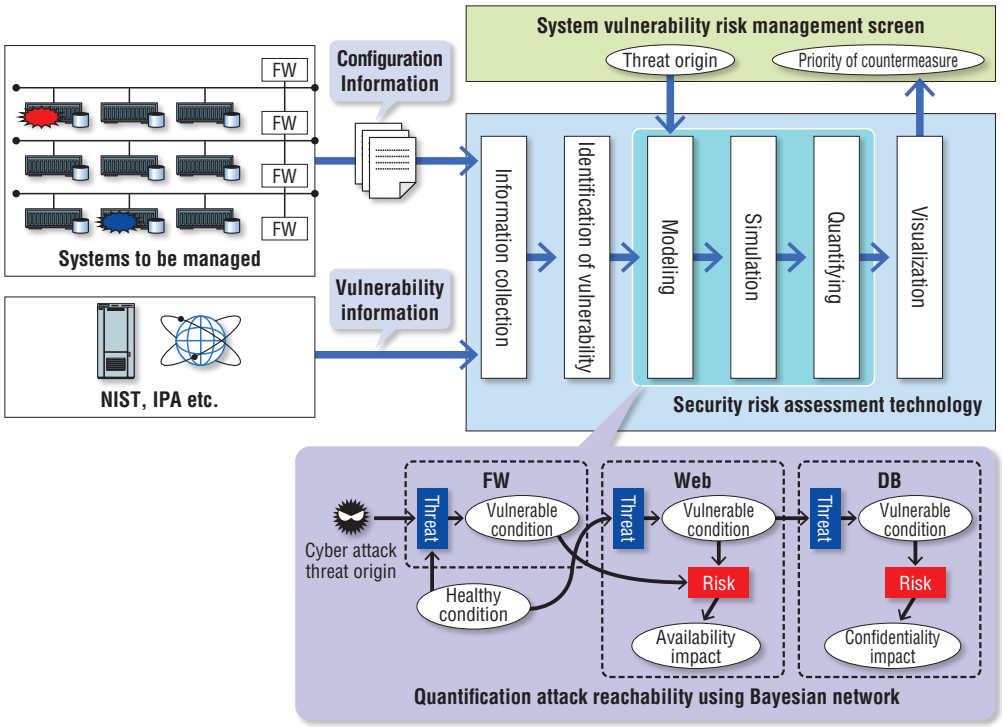
In order for this to happen, the technology automatically analyzes how likely it is that a cyber attack will reach its target from network configuration and other information, and extracts possible penetration routes for each system in a comprehensive manner.

Additionally, the penetration probability for each route and degree of impact for each vulnerability is calculated using Bayesian network technology.

With this technology, it is possible to automatically prioritize vulnerability countermeasures that require a high level of information security skills, meaning customers can expect uniform and prompt handling of vulnerabilities.

By introducing this technology to organization information system divisions and CSIRTs (computer security incident response teams) workloads associated with vulnerability measures can be significantly reduced, and organizations without a specialist will be able to easily prioritize countermeasures, meaning this technology will be useful for operating security efficiently.

Overview of security assessment technology based on attack route simulation >>



Research and development supporting product and service security

Development of self-evolving security operation technology

Recently, the importance of 24-hour security operation has been increasing due to intensified cyber attacks.

To perform security operations, operators with advanced specialist knowledge are required. However, the numbers of such human resources are insufficient.

So, Hitachi has been developing "self-evolving security operation technology", which performs security operations efficiently.

One of the security operations is to detect and block unauthorized communications.

Until now, we have registered communications determined as dangerous in a blacklist and blocked communications that match the blacklist.

However, registering all doubtful communications in a blacklist might stop the carrying out of the originally intended work.

For this reason, in situations in which incidents such as unauthorized communications might occur, both of the following reduction actions are required: "risk reduction" in which you instantly handle the incident to suppress occurrence of risks, and "reduction of the impact on work" in which you minimize the negative impact on work.

The technology that solves these issues is "self-evolving security operation technology".

This technology does not stop all doubtful communications but registers them in a graylist and temporarily keeps them on hold.

Then, when an employee or malware tries to access a website in the graylist, the technology performs a Turing Test to determine whether the access is from a human being or program.

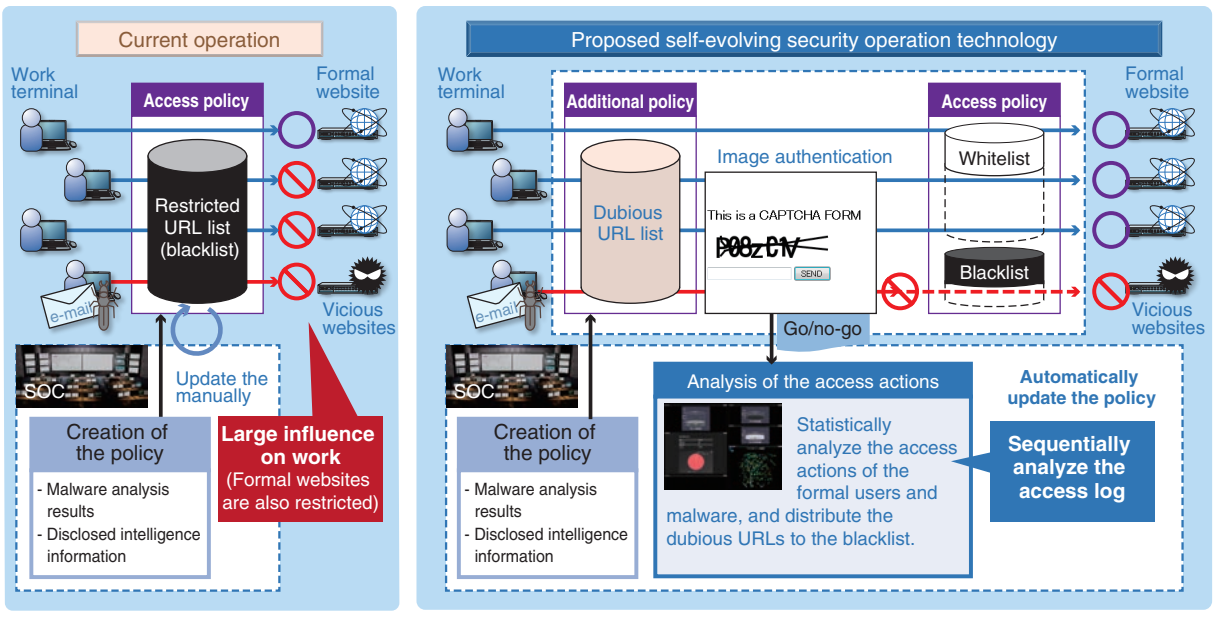
If a certain number of employees succeed in the above test, the technology considers the website to be safe and automatically moves the website from the graylist to the whitelist.

In addition, if the above test fails a certain number times, the technology considers the website to be accessed from malware, and distributes the website to the blacklist.

As described above, due to the system that statistically analyzes the authentication results of employees to enable the access policy to self-evolve, we can expect a positive network effect in which the accuracy is improved as the number of users increases.

Currently, we are promoting implementation by using a known image authentication as one of the Turning Tests, and are proceeding with evaluation by demonstration experiments.

Overview of self-evolving security operation technology >>



Research and development supporting product and service security

Development of PBI technology that achieves a safe, secure and convenient individual verification service

Damage from information leaks, unauthorized handling and other sources due to unauthorized access has increased sharply with the expansion of cloud services, electronic funds transfers, national ID and more, and reliable user verification is in demand.

Expectations about biometrics as a reliable and convenient verification method that can replace passwords are heightened, but use of this method is not widespread because of concerns about privacy.

As biometric information, for example fingerprints or veins, cannot be replaced, it was necessary to protect and manage biometric registration information (templates) in a robust manner, and common use between multiple services was not possible.

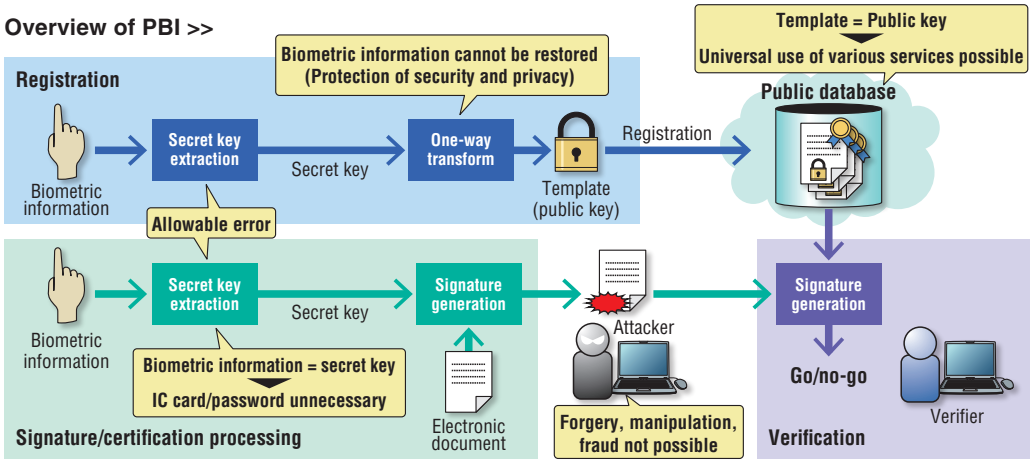
Against this background, Hitachi has developed PBI (Public Biometrics Infrastructure) technology that will safely achieve template sharing between multiple services while protecting privacy in a robust manner, by enabling the registration and verification of biometric information in its converted non-restorable form.

With this technology, the user can access various services safely and securely, hands-free and with no password, just by registering their biometric information one time

PBI technology can also achieve electronic signatures and public key encryption, which is the “secret key” to biometric information.

Because of this, public-key infrastructure (PKI) that supports safety in electronic funds transfer and electronic government services will be able to be achieved with biometric information in a safe and convenient manner, without the need to rely on IC cards or passwords.

Overview of PBI >>



Research and development supporting product and service security

Development of lightweight encryption technology that supports cyber-physical systems

In recent years, cyber-physical systems have been attracting attention. These systems provide convenient services by combining physical information about people and things collated from RFID tags and sensors, with cyber information that has accumulated on cloud computers.

For example, in the field of smart cities, by determining positions of people or status of objects using RFID tags, things like amount electricity necessary for daily life can be regulated, by and combining this information with information from ID cards possessed by users, it will be possible to provide effective services.

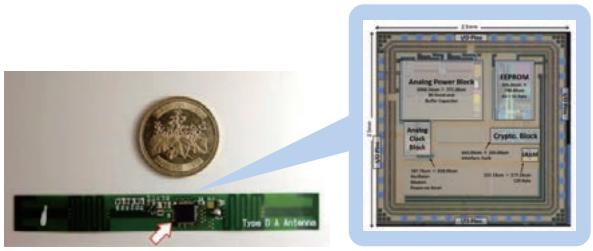
At the same time, as RFID tags are easy to swipe in a card reader, there is also the risk that the individuals' privacy may be breached by tracking of that information.

Research and development into privacy-preserving authentication protocols, which updates ID information, as technology that will mitigate these sorts of risks is moving forwards, however, as complicated encryption processes are performed in tag chips, the establishment of an effective implementation method that will make compact low energy products was an issue.

Hitachi has been working to solve these issues in cooperation with The University of Electro-Communications and other institutions, and has contributed to the realization of RFID tag chips that implement an privacy-preserving authentication protocol.

By integrating analog and digital signal processing circuits into a single circuit, the part of the circuit that processes the digital signal necessary for authenticating ID information in a concealed state was streamlined in terms of size and power, and operation was successful with a UHF band (a 920 MHz band) corresponding to a specified low-power radio station as stipulated in the new Radio Act.

In addition, a cryptographic implementation technology that operates with half of the energy consumed of conventional technologies was developed.



Secureplaza: Total security solution achieving customer security

Secureplaza: Hitachi's Total Security Solution

Information security needs to be dealt according to the following three aspects: ① Countermeasures for the various threats surrounding information technology; ② Strict adherence to the law, including the Personal Information Protection Law and the Basic Act on Cybersecurity; ③ Strategies for national policy, as well as different types of standards and industry guidelines. Hitachi presents Secureplaza, a total security solution bringing solutions to issues that change on a daily basis, and continuous security to your organization.

Security countermeasures for organization systems

In this day and age, information security measures from a variety of different perspectives are essential for organizations, including system protection, business continuity, social responsibility, and maintenance of organization brand, and it is necessary to work from three different aspects in order to achieve these measures.

(1) Countermeasures for the various threats surrounding information technology
(2) Strategies for compliance, strict adherence to the law
(3) Strategies for creating standards and guidelines

A wide range of countermeasures are necessary for all of these aspects, including but not limited to: (1) Measures for new threats that appear one after the other via networks, and preventative measures for information leaks; (2) Strict compliance to laws, in particular the Personal Information Protection Law and the Basic Act on Cybersecurity, and a strategy for Japan's social security and tax number system "My Number" ; (3) Conformity with industry guidelines, starting with international standards like the ISO/IEC series, and PCI DSS.

Secureplaza has strategies for dealing with all of these aspects in a comprehensive manner.

The total security solution: Secureplaza

The trend towards utilizing Internet technology like IP protocols and web systems in organization system infrastructure started to gain speed from about 1996, and coupled with the increased functionality of PC terminals, strategies for security have become an extremely important issue.

In order to deal with these issues, Secureplaza was formulated and released in 1998 as a total security solution system that could deal with various customer security requirements in a flexible way.

Since then, solutions for the various security issues that organizations face have been continuously expanding, including strategies for new threats appearing one after the other, strict compliance with laws starting with the Personal Information Protection Law, and compliance with international standards and industry guidelines.

The structure for these solutions are equipped with the following features.

① They cover a variety of security measures in organization systems, from IT security to physical security.
② They include over 300 security product categories, and can respond to a variety of requirements (like threat types, security levels, system configurations, on-demand specifications, operational flows, and costs), in a flexible manner.

Secureplaza solutions structure >>

Solution category	Threat/issue	Secureplaza solutions
Security regulations	●Incomplete security regulations/rules ●Inadequate incident response	GR Governance and Risk management
Identity management	●Unauthorized use of information systems ●Rigorous individual authentication	IM Identity Management
Physical security	●Unauthorized intrusion from outside ●Theft, loss, or accidental disposal of documents or items	TZ Trusted Zone management
Data security	●Destruction or manipulation of information ●Information leak	DS Data Security
Network security	●Cyber attacks ●Malware infection/attacks exploiting vulnerabilities	NS Network Security

Secureplaza: Total security solution achieving customer security

Secureplaza initiatives and the future direction of security countermeasures

The fundamental principles of organization systems moving from the era of centralized processing by mainframes to the era of distributed processing, CSS, and network processing have been cost reduction, usability improvement, and operating effectiveness improvement. Organization systems have developed towards server and information distributed processing, rich client use, and Internet and cloud computing utilization.

At the same time, with the appearance of a variety of new threats like targeted cyber attacks aimed at particular organizations and companies, risks have also increased, and other issues have surfaced, like compliance.

In response to this, a variety of security countermeasures have come to be taken retrospectively.

New security issues have also appeared with the utilization of big data, the evolution of IoT*, and compliance with Japan's social security and tax number system "My Number".

Emergency countermeasures to protect bank systems from cyber attacks are also a significant type of measure for the future, and it has become important to incorporate security requirements at the investigation stage of system construction, and strategically implement medium and long term security measures.

For the construction of more optimal organizations systems, Secureplaza classifies the key requirements (including fundamental improvements in security, streamlining of operational management, and utilization of cloud security services) as follows, and thereby offers solutions that can address diverse needs.

① Risk management as an organization
② User authentication and identity management
③ Physical management of people and things (documents, goods etc.)
④ Security assurance of information (data) itself
⑤ Security countermeasures during network use

*IoT: Internet of Things
(All things, including household electrical goods, bicycles, and more, being connected to the Internet.)

① Risk management as an organization

The organization has no security policies, and security countermeasures are not possible.

A structure by which incidents can be determined and responded to within the organization is vital.

Secureplaza GR (Governance and Risk management) will support the formulation of a security plan that will achieve this sort of enterprize management, establish a CSIRT*1, and organize a SOC*3 with SIEM*2.

② User authentication and identity management

Secureplaza IM(Identity Management) offers authentication solutions, which utilize integrated identity management systems that designate personnel databases as source information and automatically distribute (provisioning) accounts to each system, and IC cards and biometric information (finger vein etc.) that achieve robust verification that prevents unauthorized use.

③ Physical management of people and things (documents, goods etc.)

Secureplaza TZ (Trusted Zone) offers entrance/exit management based on zoning corresponding to different security levels, and security management that follows the life cycle of items and documents or printed matter.

④ Security assurance of information (data) itself

Secureplaza DS (Data Security) offers a system that will protect organization information assets from destruction or manipulation and leaks while at the same time allowing safe use.

⑤ Security countermeasures during network use

For unauthorized access or attacks (including targeted attacks) from outside an organization, Secureplaza NS (Network Security) offers network layer countermeasures such as detecting and blocking, which include cloud security services.

*1 CSIRT: Computer Security Incident Response Team
*2 SIEM: Security Information and Event Management
*3 SOC: Security Operation Center

Company-external information security related activities

Hitachi leverages the skills and experiences of each of its staff members to achieve a more secure information technology based society through participating in different types of security related company-external activities.

International standardization activities

Hitachi participates in the following activities relating to international standardization.

●ISO/IEC JTC1/SC27

Subcommittee SC27 of the joint technical committee ISO/IEC JTC1 of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC), formed to internationalize standards, is investigating the standardization of information security management systems (WG 1), cryptography and security mechanisms (WG 2), security assessment technology (WG 3), security controls and services (WG 4), and identity management and privacy technologies (WG 5).

●ISO TC292

The International Organization for Standardization (ISO) technical committee (TC) 292 is investigating the standardization of the security field including general security management, business continuity management, resilience and emergency management, fraud prevention countermeasures and management, security services, and homeland security.

●ISO TC262

The International Organization for Standardization (ISO) technical committee (TC) 262 is standardizing terms, principles and policies, risk assessment techniques and more for all risks, under the theme of risk management.

●ITU-T SG17

SG17, one of the study groups (SGs) of the International Telecommunication Union-Telecommunication Standardization Sector of the International Telecommunication Union, is investigating the standardization of cyber security, security management for communications vendors, telebiometrics, of security capabilities for communications and applications services, spam countermeasures, and identity management.

●IEC TC65/WG10, WG20

Technical committee TC 65 of the International Electrotechnical Commission (IEC) is promoting the standardization of industrial automation, monitoring, and control. TC 65/WG 10 is promoting the formulation of the standards (IEC 62443) regarding network control systems and control device security.

In addition, TC 65/WG 20 is investigating the standardization regarding achievement of both safety (IEC 61508) and security (IEC 62443).

Participation in FIRST (Forum of Incident Response and Security Teams)

FIRST is an international community of worldwide computer incident response teams bound together by a relationship of trust.

Presently more than 350 teams are participating, from more than 70 countries.

Hitachi' s HIRT (Hitachi Incident Response Team) is also a member.

Other activities

Hitachi is also participating in a variety of security related activities like the ones listed below, including research, investigation and promulgation, and enlightenment activities.

- Information-technology Promotion Agency, Japan (IPA)
  Contributing author to “10 Major Security Threats Committee”, and more
- The JIPDEC Conformity Assessment Scheme
  ISMS(Information Security Management System) expert committee,
  CSMS (Cyber Security Management System) technical committee
- Telecom-ISAC Japan
- Council of Anti-Phishing Japan
- Nippon CSIRT Association
- Japan Information Security Audit Association (JASA)
- Japan ISMS User Group
- Japan Electric Measuring Instruments Manufacturers’ Association (JEMIMA) Process automation and factory automation measurement control committee security survey and research WG
- Control System Security Center (CSSC)
- Industrial Internet Consortium Security Working Group

Third party assessment and certification

Hitachi promotes the acquisition of third party assessments and certifications relating to personal information protection, information security management, and products.

Privacy Mark Acquisition

The following companies have permission to use the Privacy Mark, acquired by Hitachi from JIPDEC (as of May 31, 2016).

Hitachi, Ltd.
Hitachi, Ltd. Corporate Hospital Group

Hitachi Auto Service Co., Ltd.
Hitachi Business International, Ltd.
Hitachi Cable Networks, Ltd.
Hitachi Collabonext Transport System Co., Ltd.
Hitachi Consulting Co., Ltd.
Hitachi Capital Corporation
Hitachi Capital NBL Corporation
Hitachi Capital Servicer Corporation
Hitachi Capital Services Co., Ltd.
Hitachi Distribution Software Co., Ltd.
Hitachi Document Solutions Co., Ltd.
Hitachi Foods & Logistics Systems Inc.
Hitachi Government & Public Sector Systems, Ltd.
Hitachi High-Tech Solutions Corporation
Hitachi Hi-System21 Co., Ltd.
Hitachi ICT Business Services, Ltd.
Hitachi Industry & Control Solutions, Ltd.
Hitachi Information Academy Co., Ltd.
Hitachi Information & Telecommunication Engineering, Ltd.
Hitachi Information Engineering, Ltd.
Hitachi INS Software, Ltd.1997,
Hitachi Inspharma, Ltd.
Hitachi Insurance Services, Ltd.
Hitachi-kenpo
Hitachi KE Systems, Ltd.
Hitachi Management Partner Corp.
Hitachi Medical Computer Systems, inc.
Hitachi-Omron Terminal Solutions, Corp
Hitachi Power Solutions Co., Ltd.
Hitachi Research Institute
Hitachi Softec Co.,Ltd.
Hitachi Solutions, Ltd.
Hitachi Solutions Create, Ltd.
Hitachi Solutions East Japan, Ltd.
Hitachi Solutions Service, Ltd.
Hitachi Solutions West Japan, Ltd.
Hitachi Systems, Ltd.
Hitachi Systems Engineering Services, Ltd.
Hitachi Systems Facility Services, Ltd.
Hitachi Systems Networks, Ltd.
Hitachi Systems Power Services, Ltd.
Hitachi Systems Techno Services, Ltd.
Hitachi Technical Communications Co., Ltd.
Hitachi Transport System, Ltd.
Hitachi Travel Bureau, Ltd.
Hitachi Triplewin Corporation
Hitachi SC, Ltd.
Hitachi Techno-Information Services, Ltd.
Hitachi Urban Support, Ltd.
Hokkaido Hitachi Systems, Ltd.
Kokusai Electric Techno Service Co., Ltd.
Kyushu Hitachi Systems, Ltd.
Okinawa Hitachi Network Systems, Ltd.
Shikoku Hitachi Systems, Ltd.
Tokyo Eco Recycle Co., Ltd.

ISMS Certification

The following companies or organizations within companies at Hitachi have obtained ISMS certification from JIPDEC based on the international standard for information security management system ISO/IEC 27001 (as of March 31, 2016)

Hitachi, Ltd. (Cloud Services Division)
Hitachi, Ltd. (Information & Telecommunication Systems Company/Government & Public Corporation Information Systems Division)
Hitachi, Ltd. (Information & Telecommunication Systems Company, Smart Information Systems Division Healthcare Division, Healthcare Service Department No.1, Healthcare Solution Department No.1)
Hitachi, Ltd. (Infrastructure Systems Company)
Hitachi, Ltd. (IT Services Division e-Platform Promotion Office Data Center Department)
Hitachi, Ltd. Defense Systems Company and Hitachi Advanced Systems Corporation

ALAXALA Networks Corporation
Hitachi INS Software, Ltd.
ICS Co., Ltd.
Hitachi Cable Networks, Ltd.
Hitachi Government & Public Sector Systems, Ltd. (Entire company)
Hitachi High-Tech Solutions Corporation (Solution Center)
Hitachi ICT Business Services, Ltd. (Media Solution Department Media Service Group)
Hitachi KE Systems, Ltd. (Tokyo Development Center)
Hitachi Kokusai Yagi Solutions Inc. (Solution Division)
Hitachi Management Partner Corp.
Hitachi-Omron Terminal Solutions, Corp
Hitachi Pharma Evolutions, Ltd.
Hitachi Power Solutions Co., Ltd.
Hitachi SC, Ltd. (Headquarters)
Hitachi Solutions Create, Ltd. (Developing and building systems for government offices, and maintaining services)
Hitachi Solutions, Ltd. (Security Diagnosis Division)
Hitachi Solutions West Japan, Ltd. (Cloud Business Promotion Center)
Hitachi Systems, Ltd. (Akita/Sendai-Center)
Hitachi Systems, Ltd. (Contact Center Administration Division)
Hitachi Systems, Ltd. (Financial Platform Division Service Office ATM Cloud Computing Service Department)
Hitachi Systems, Ltd. (Hitachi Solution Support Center, Hitachi Integrated Operation Control Center)
Hitachi Systems, Ltd. (Outsourcing Data Center Division)
Hitachi Systems, Ltd. (Public Platform Division)
Hitachi Systems, Ltd. (SHIELD Security Center)
Hitachi Systems Engineering Services, Ltd.
Hitachi Systems Power Services, Ltd. (IT Service Division Social)
Hitachi Transport System, Ltd.

IT Security Certification

The following main products have been certified by the "IT Security Evaluation and Certification Scheme" based on the ISO/IEC 15408 (Common Criteria) which is operated by the Information-technology Promotion Agency, Japan (IPA) (as of the March 10, 2017; includes listings from the certified product archive list).

Product	TOE Category*1	Certification number	Evaluation Assurance Level*2
HiRDB/Parallel Server Version 8 08-04	Database Management System	C0225	EAL4+ALC_FLR.1
HiRDB/Single Server Version 8 08-04	Database Management System	C0216	EAL4+ALC_FLR.1
HiRDB Server Version 9 (Linux edition) 09-01	Database Management System	C0351	EAL2+ALC_FLR.2
Smart Folder PKI MULTOS application 03-06	Smart card application software	C0014	EAL4
Enterprise Certificate Server Set 01-01-A	Certification authority function	C0013	EAL3
JP1/Base Certification server 08-10 (Windows edition)	System operation management	C0114	EAL2+ALC_FLR.1
uCosminexus Application Server 08-00	Application server	C0234	EAL2+ALC_FLR.1
EUR Form Client 05-07	Form data creation support software	C0068	EAL2+ALC_FLR.1
Hitachi Device Manager Software, Hitachi Tiered Storage Manager Software 8.0.1-02	Access Control Device and Systems	C0536	EAL2+ALC_FLR.1
Hitachi Command Suite Common Component 7.0.1-00	Circuit board module	C0303	EAL2+ALC_FLR.1
Hitachi Storage Command Suite Common Component 6.0.0-01	Circuit board module	C0199	EAL2+ALC_FLR.1
Hitachi Virtual Storage Platform G1000, Hitachi Virtual Storage Platform VX7 Control Program 80-01-25-00/00(R8-01A-06_Z)	Control Program for storage system	C0514	EAL2+ALC_FLR.1
Hitachi Unified Storage VM Control Program 73-03-09-00/00(H7-03-10_Z)	Control Program for storage system	C0513	EAL2+ALC_FLR.1
Hitachi Unified Storage 110 Microprogram 0917/A	Storage device control software	C0421	EAL2
Hitachi Unified Storage 130 Microprogram 0917/A	Storage device control software	C0420	EAL2
Hitachi Unified Storage 150 Microprogram 0917/A	Storage device control software	C0419	EAL2
Hitachi Virtual Storage Platform, Hitachi Virtual Storage Platform VP9500 control program 70-02-05-00/00（R7-02-06A）	Storage device control software	C0315	EAL2
Hitachi Adaptable Modular Storage Microprogram 0862/A Hitachi Adaptable Modular Storage 2300 Microprogram 0862/ A-M	Display equipment control software	C0220	EAL2
Hitachi Universal Storage Platform V, Hitachi Universal Storage Platform H24000, Hitachi Universal Storage Platform VM, Hitachi Universal Storage Platform H20000 Control Program 60-02-32-00/00（R6-02A-14）	Storage device control software	C0200	EAL2
SANRISE Universal Storage Platform CHA/DKA Program*3 TagmaStore Universal Storage Platform CHA/DKA Program*4 SANRISE Network Storage Controller CHA/DKA Program*3 TagmaStore Network Storage Controller CHA/DKA Program*4 SANRISE H12000 CHA/DKA Program*3 SANRISE H10000 CHA/DKA Program 50-04-34-00/00*3	Storage device control software	C0102	EAL2
Finger Vein Authentication Device UBReader2 Hardware: D, Software: 03-00	Biometric equipment	C0332	EAL2
Certificate validation server 03-00	PKI	C0135	EAL2
Appliporter Security Kit Version 01-00	Electronic application basic software	C0025	EAL2
DocumentBroker Server Version 3 03-11	Document management	C0158	EAL1+ASE_OBJ.2、ASE_REQ.2、ASE_SPD.1
CBT Engine 01-00	Major application for CBT assessment system	C0288	EAL1+ASE_OBJ.2、ASE_REQ.2、ASE_SPD.1
Security Threat Exclusion System SHIELD/ExLink-IA 1.0	Security management software	C0090	EAL1

*1 TOE (Target of Evaluation):
TOE refers to software, firmware or hardware that will be the target of evaluation.
In some instances this also includes related administrator and user manuals (user guidances, installation procedures manuals etc.)

*2 EAL (Evaluation Assurance Level):
In ISO/IEC 15408, the degree of assurance of evaluation criteria (assurance requirements) is divided into 7 levels, from EAL1 to EAL7, with assessment requirements getting stricter as the levels get higher.
- In EAL1, the suitability of security functions are tested, and guidance for maintaining security is evaluated objectively.
- In EAL2, assessment is augmented from a product integrity perspective, analyzing vulnerabilities imagining common attack capabilities from the manufacturing to the operation stages. The regular development cycle is adjusted to include a security perspective.
- In addition to the assurances of EAL2, EAL3 also evaluates test comprehensiveness, and the development environment for the purpose of preventing product manipulation during the development process.
- EAL4 is considered the highest level for commercial products. The integrity and source code of development assets in the development environment, and the development life cycle overall including the reliability of key personnel, are evaluated.
- ALC_FLR.1 is an objective evaluation of the basic procedures for providing the necessary patch when a security defect is discovered in the product. Assurance requirements not included in the EAL stipulated in the standards can be supplemented, which in this case would be displayed as EAL2+ALC_FLR.1. ALC_FLR.2 necessitates the acceptance of reports from users and the provision of notifications to users.

*3 Japan domestic

*4 outside of Japan

Encryption module testing and certification

The following products have been certified by the Japan Cryptographic Module Validation Program (JCMVP) based on ISO/IEC 19790 which is operated by the Information-technology Promotion Agency, Japan (IPA), or Cryptographic Module Validation Program (CMVP) based on FIPS140-2 which is operated by the USA's NIST and Canada's CSE (as of March 10, 2017).

Cryptographic Module	Certification number	Level
Hitachi Virtual Storage Platform (VSP) Encryption Adapter	CMVP #2727	Level 2
Hitachi Virtual Storage Platform (VSP) Encryption Board	CMVP #2694	Level 1
Hitachi Virtual Storage Platform (VSP) Encryption Module	CMVP #2462	Level 2
Hitachi Virtual Storage Platform (VSP) Encryption Engine	CMVP #2386	Level 1
Hitachi Unified Storage Encryption Module	CMVP #2232	Level 1
HIBUN Cryptographic Module for User-Mode 1.0 Rev.2	JCMVP #J0015, CMVP #1696	Level 1 (*1)
HIBUN Cryptographic Module for Kernel-Mode 1.0 Rev.2	JCMVP #J0016, CMVP #1697	Level 1 (*1)
HIBUN Cryptographic Module for Pre-boot 1.0 Rev.2	JCMVP #J0017, CMVP #1698	Level 1 (*1)
Keymate/Crypto JCMVP Library 04-00 (Solaris edition, Windows edition)	JCMVP #J0007	Level 1
Keymate/Crypto JCMVP Library 04-00	JCMVP #J0005	Level 1

*1 This Cryptographic Module has been certified JCMVP and CMVP simultaneously (joint certification).
ISO/IEC 19790 as applied by JCMVP uses Federal Information Processing Standard (FIPS) 140-2 as applied by CMVP as a base, with equivalent standards.

Control device security certification

The ISCI*1 is an international security certification system for control devices run by the Control System Security Center (CSSC). Products certified by the ISCI' s "ISASecure® EDSA certification" *2 are as follows. (As of March 31, 2016).

Product	Certification number	Certification acquisition level
Controller HISEC 04/R900E	CSSC-C00002	EDSA 2010.1 Level 1

*1 ISCI: ISA Security Compliance Institute *2 EDSA: Embedded Device Security Assurance

Hitachi Group Overview

Company Profile (as of March 31, 2016)

Corporate name: Hitachi, Ltd.
Incorporated: February 1, 1920 (founded in 1910)
Head office: 1-6-6 Marunouchi, Chiyoda-ku, Tokyo 100-8280, Japan
Representative: Toshiaki Higashihara
Representative Executive Officer, President, and CEO

Capital: 458.79 billion yen
Number of employees: 37,353 (unconsolidated basis)
335,244 (consolidated basis)
Number of consolidated subsidiaries: 1,056
(Japan: 262, outside of Japan: 794)
(Including variable interest entities)
Number of equity-method affiliates: 249

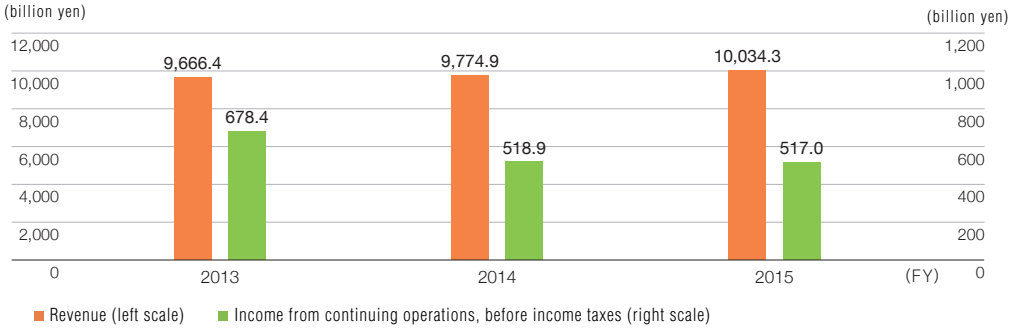
Consolidated Financial Highlights for Fiscal 2015, Based on the International Financial Reporting Standards (IFRS)

Revenues: 10,034.3 billion yen (up 3%, year on year)
EBIT*1: 531.0 billion yen (down 1%)
Income from continuing operations, before income taxes: 517.0 billion yen (unchanged)
Capital expenditure*2: 528.5 billion yen (up 23%)

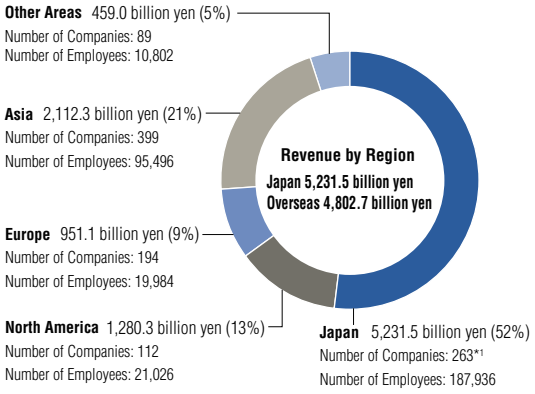
R&D expenditure: 333.7 billion yen(unchanged)
Total assets: 12,551.0 billion yen
Overseas production as percentage of revenue: 26%

*1 EBIT: Income from continuing operations before income tax, less interest income, plus interest charges.
*2 Since fiscal 2015, the amount of investment in leased assets that fall under the heading of finance and leases included in conventional capital expenditure are deducted from capital expenditure for disclosure.
Note: Hitachi's consolidated financial statement is prepared based on the International Financial Reporting Standards (IFRS).

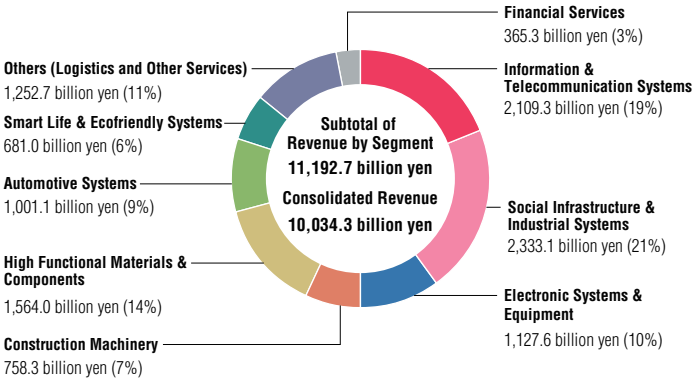
●Revenue and Income from Continuing Operations, Before Income Taxes



●Revenues and ratio by region
(Consolidated for fiscal 2015, based on IFRS)



●Revenue and Ratio by Segment
(Consolidated for fiscal 2015, based on IFRS)



*1 Including Hitachi, Ltd. and 262 consolidated subsidiaries in Japan.

Hitachi, Ltd.

IT Strategy Division, IT Security Management Department

1-6-6 Marunouchi, Chiyoda-ku, Tokyo 100-8280

Tel: 03-3258-1111