Sniper IPS
NOWCOM 나우콤

SNIPER IPS V6.0.e

Security Target

Version 1.04

2008/1/16

NOWCOM Co., Ltd

Summary

This document is a Security Target for the network prevention system (TOE: SNIPER IPS, Version: V6.0.e, Platform: Self OS (SNIPER OSv1.0)).

Revision History

Version	Date	Reason for alteration
Version 1.00	2006/10/25	First registered
Version 1.01	2007/7/18	Alteration in the name of the TOE
Version 1.02	2007/9/3	1. Alteration followed by the OR 1) SFR alteration (add, modify) • FDP_IFC.1(3) Subset information flow control (3) • FDP_IFC.1(4) Subset information flow control (4)
Version 1.03	2007/10/2	1. Alteration followed by the OR 1) SFR alteration
Version 1.04	2008/1/16	1. Change: Company Name (WinsTechnet→NOWCOM) 2. Add: E1000, E2000(Y11/K11), E4000(Y11/K11) 3. Change: Physical Scope

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Intrusion Prevention System SNIPER IPS V.6.0e will be described as ‘SNIPER’ from this page.

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1. Security Target Introduction

This document is the security target of a network prevention system (TOE: SNIPER IPS, Product Version: V6.0e, Platform: Self OS (SNIPER OS v1.0)). Based on the Network Intrusion Prevention System Protection Profile (Dec. 21, 2005, KISA), this ST defines the security functions and assurance measures and describes the security requirements used for evaluation and general information such as implementation methods and technical information.

1.1 ST Identification

ST Title	SNIPER IPS V6.0.e Security Target
ST Version	V.1.04
Release date	2007/10/2
ST Author	NOWCOM Co.,Ltd.
TOE Identifier	SNIPER IPS V6.0.e
Common Criteria (CC)	The Common Criteria for IT Security Evaluation (2005-25 the Ministry of Information and Communication)
Evaluation Assurance Level	EAL4
Protection Profile claimed	Network Intrusion Prevention System Protection Profile V1.1, 2005.12.21, KISA)
TOE Description	The TOE has its basis upon Intrusion Detection System (IDS) developed by NOWCOM Co., Ltd. With the latest state-of-the-art prevention engine added on IDS, SNIPER has become capable to not only detect but also prevent attacks toward the IT entities. The TOE is an Intrusion Protection System (IPS) that is installed in an In-line mode at the connection point of the external and internal network, detecting/blocking intrusions and attacks in real-time.
Search Keywords	SNIPER IPS, Network-based Intrusion Detection, Intrusion Analysis, Intrusion Countermeasure, Intrusion Prevention System, Information flow control

[Table-1] ST Identification

1.2 Security Target (ST) Overview

SNIPER is an Intrusion Prevention System (IPS) that is installed in an In-line mode at the connection point of the remote and local network, detecting/blocking network intrusions and attacks inflowing into the local server. SNIPER provides intrusion detection function that collects, analyzes, and countermeasures the information generated by the user. It also provides intrusion protection function that blocks harmful packets, security management function, maintenance management function, live update function, user identification and authentication function, and lastly audit function that audit records activities of the administrator.

Prepared for CC certification of SNIPER, this ST provides ST introduction, TOE description, TOE security environment, TOE security objectives, IT security requirements, and TOE summary specification, and describes the protection profile claimed and the rationale.

1) ST includes ST introduction, TOE description, TOE security environment, TOE security objective, IT security requirements, TOE summary specification, PP claims, and the rationale.

2) “TOE Description” gives broad information about the product type, general TOE function, and SNIPER Scope and Boundary.

3) “TOE Security Environment” provides assumptions on environments where TOE is or will be used, explains threats that may exploit vulnerabilities either willingly or by chance, and describes security policies that are enforced by an organization and that TOE should adhere to, such as rules, procedures, practices, and guidelines.

4) “Security Objectives” describes the security objectives for the TOE and the environment required for reacting to threats and for satisfying assumptions and organizational security policies.

5) “IT Security Requirements” describes the security requirements for the TOE and the IT environment required to meet the security objectives.

6) “TOE Summary Specification” defines IT security functions that satisfy identified security functional requirements and describes assurance measures that satisfy the identified security assurance requirements.

7) “PP claims” identifies referred protection profiles, refines requirements of the protection profile, and describes PP tailoring that identifies the IT security requirements.

8) “Rationale” proves that the security objectives are appropriately defined and are addressing all security problems (stated through threats, assumptions, and organizational security policies), that the security requirements are adequate, and that the dependency of unsatisfied security requirements is unnecessary.

1.3 Common Criteria (CC) Conformance

TOE conforms to the Common Criteria for Information Technology Security Evaluation, Version 2.3 below and applies Final Interpretation (Oct. 2005).

1) Part 2 Conformant

The security functional requirements of the TOE conform to the functional components in Part 2.

2) Part 3 Conformant

The security assurance requirements of the TOE conform to the assurance components in Part 3.

3) Evaluation Assurance Level

Evaluation Assurance Level of the TOE is EAL4.

4) Protection Profile Conformance

The TOE conforms to Network Intrusion Prevention System Protection Profile V1.1 (Dec. 21, 2005, KISA).

5) SOF claim

The SOF targeted by the TOE is SOF-medium.

1.4 Glossary

• Audit Trail

A set of disk records that indicates information of users and their conducts.

• Object

An entity within the TSC (TSF Scope of Control) that contains or receives information and upon which subjects perform operations.

• Attack potential

The perceived potential for success of an attack, should an attack be launched, expressed in terms of an attacker's expertise, resources, and motivation.

• SOF, Strength-of –Function

A qualification of the TOE security function expressing the minimum efforts necessary to defeat its expected security behavior by directly attacking its underlying security mechanisms.

• SOF- medium

A level of TOE strength of function (SOF) where analysis shows that the function provides adequate protection against straightforward or intentional breach of TOE security by attackers possessing a moderate attack potential.

• Iteration

One of the CC operations. The use of a component more than once with varying operations.

• Protected Systems

Asset protected by the security policy of an intrusion prevention system. For example, the protected system of a network-based intrusion prevention system is the network service or resource, and the protected system of a host-based intrusion prevention system is the resource or information saved in the host.

• ST, Security Target

A set of security requirements and specifications to be used as the basis for evaluation of the TOE.

• Security violation events list

Detects intrusions by comparing the audit list or network packet with the intrusion detection events list that was predefined at Intrusion Detection System. In this case, the predefined intrusion events list stored at IDS is security violation events list.

• PP, Protection Profile

An implementation-independent set of security requirements for a category of TOEs that meet specific consumer needs.

• Black hole

A blocking policy list defining packets that needs to be blocked among the incoming traffics to SNIPER IPS. Since the blocking policy is set to its each time-out, it automatically deletes if it passed the expiration time.

• Anomaly Detection

Anomaly Detection is a detection method that has its basis on statistical means. It first creates profiles of normal actions of users, and then detects anomalies that deviate from those profiles.

• Human User

Any person who interacts with the TOE

• User

Any entity (human user or external IT entity) outside the TOE that interacts with the TOE.

• Selection

One of the CC operations. The specification of one or more items from a list in a component.

• Identity

A representation (e.g. a string) uniquely identifying an authorized user.

• Element

An indivisible security requirement.

• Role

A predefined set of rules establishing the allowed interactions between a user and the TOE (e.g. user, administrator).

• Operation

Making a component react to specific threats or satisfy specific security policy (e.g. iteration, assignment, selection, refinement).

• Threat Agent

An unauthorized user or external IT entity that poses threats to assets such as illegal access, modification,

or deletion.

• External IT Entity

Any IT product or system, untrusted or trusted, outside of the TOE that interacts with the TOE.

• Authorized Administrator

User who may, in accordance with the TOE security policy (TSP), execute functions of the TOE.

• In-line Mode

In-line mode enables the real-time analysis and blocking of the packets.

In case when the system fails to operate in a normal status, In-line mode can be configured to send a periodical signal via the Keep-alive Timer.

• OPIE: One-time Passwords In Everything

OPIE is a One-time Passwords system developed at the US NRL (Naval Research Laboratory) and has its basic technology on S/Key developed from Bellcore. Each password used in OPIE alters every time it goes through the authentication, and thus, even the stolen password cannot gain access right to the system. It is also known as OTP (One-Time Password).

• Authentication Data

Information used to verify the claimed identity of a user.

• Assets

Information or resources to be protected by the countermeasures of the TOE.

• Refinement

One of the CC operations. The addition of details to a component.

• The Common Criteria for IT security evaluation (CC)

It refers to common criteria for IT security evaluation proclaimed by the minister of information and communication on May 21st 2005. The Common Criteria for IT security evaluation is a Korean version of the International Common Criteria (CC) version 2.3 that was developed to attain common language and mutual understanding based on the criteria of various countries.

• Organisational Security Policies

The security rules, procedures, practices, or guidelines imposed by an organization upon its operations.

• Dependency

The relationship between requirements such that the requirement that is depended upon must normally be satisfied for the other requirements to be able to meet their objectives.

• Subject

An entity within TSC that causes operations to be performed.

• Final Interpretations

An officially released document by CCIB with additional interpretations or correction of errors to the official CC

• Augmentation

The addition of one or more assurance component(s) from Part 3 to an EAL or assurance package.

• Component

The smallest selectable set of elements that may be included in a PP and ST.

• Class

A grouping of families that share a common security objective.

• TOE, Target of Evaluation

An IT product or system documentation that is the subject of an evaluation and its associated administrator and user guidance.

• Evaluation Assurance Level (EAL)

A package consisting of assurance components from Part 3 that represents a point on the CC predefined assurance scale.

• Family

A grouping of components from CC that share common security objectives but may differ in emphasis or rigor.

• Packet

A set of data that is used in transmitting data on the network. Instead of transmitting data continually between the two points, packet transmission includes the method that divides transmitting data into adequate pieces to consist packet forms and transmit them one by one. Each packet contains not only a consistent size of data but also contains receiving place, address or even control information such as control code.

• Abstract machine

It may be a hardware/firmware platform or a combination of hardware/software known as or assessed operating like an abstract machine. As underlying abstract machine used in this function package becomes OS when the TOE is application program and refers to firmware or hardware when the TOE is OS.

• Assignment

One of the CC operations. The specification of an identical parameter in a component.

• Extension

The addition to an ST or PP of functional requirements not contained in Part 2 and/or assurance requirements not contained in Part 3 of the CC.

• Challenge Value

A value used at OPIE. Obtains result value that can access to the server with passwords that the users remember or with a combination of Key and Seed.

• DOM (Disk on Module)

DOM (Disk on Module) is a high-performance embedded flash memory data storage system. It is suitable for semi-condonductors of the massive storage device. Operation system of the SNIPER IPS is installed in the DOM. It can also be connected to the ATA standard interfafce. As the DOM communicates with ATA standard interface via the internal micro-controller and file management firmware, it does not require additional FFS (Flash File System), MTD (Memory Technology Driver) or host software.

• GUI (Graphical User Interface)

A graphic user interface. It implements interface between the user and computer into a graphic.

• HA (High Availability)

HA refers to a system or component that is capable of constant operation over certain length of time. In order to maintain the network operation intact on all occasions, SNIPER is consisted of two device units. When one of the two systems confronts a failure, it sends traffic to the other system so that the network service remains intact.

• QoS (Quality of Service)

An idea of attributes that can be somewhat guaranteed beforehand. QoS is also capable of transfer rate, error rate, estimation, and improvement on the internet or other networks. It refers to a function that insures consistent traffic processing load and therefore provides trusted service on the network device.

• Seed Value

A part of identifier that is generated from the system or specified by the user. It is composed of the combination of characters and numbers. (example, sn12345).

• TSF, TOE Security Function

A set consisting of all hardware, software, and firmware of the TOE that must be relied upon for the correct enforcement of the TSP.

• TSP, TOE Security Policy

A set of rules that regulates the administration, protection, and distribution of assets within the TOE.

• TSF Data

Data created by and for the TOE that might affect the operation of the TOE.

• TSC, TSF Scope of Control

The set of interactions that can occur within the TOE and is subject to the rules of the TSP.

• TTL (Time-To-Live)

TTL is a value that exists inside the IP packet. TTL notifies the router whether a packet should be discarded since it stays too long inside the network. Packets may not be delivered to the designated place in time due to many reasons. For instance, the combination of incorrect routing tables may cause endless circulation of packet. When a certain period of time goes by, TTL is used as a solution in order to notify a sender so that the sender may decide whether to discard the packet and retransmit. Initial value of the TTL is normally set to 8 bit long packet heather by the system.

• Common abbreviations of CC

CC	Common Criteria
CCIMB	Common Criteria Interpretation Management Board
CPU	Central Processing Unit
EAL	Evaluation Assurance Level
FI	Final Interpretation
IP	Internet Protocol
IT	Information Technology
PP	Protection Profile
RFC	Request for Comments
SFP	Security Function Policy
SOF	Strength of Function
ST	Security Target

TOE	Target of Evaluation
TSC	TSF Scope of Control
TSF	TOE Security Functions
TSP	TOE Security Policy

1.5 References

[1] Common Criteria for Information Technology Security Evaluation v2.3, the Ministry of Information and Communication (2005-25)

[2] Network Intrusion Prevention System Protection Profile for a state organ use V1.1 Dec. 21, 2005, KISA

[3] Protection Profile and Security Target writing guide, Information and communication standards TTAR-0011, Dec. 11, 2002, KISA

[4] Common Criteria for Information Technology Security Evaluation v2.3 CCMB-2005-08, KISA

[5] Common Criteria for Information Technology Security Evaluation v2.3 CCMB-2005-08-004, KISA

2. TOE Description

2.1 Product Type

1) TOE is a network-based intrusion prevention system equipped with a function that can safely protect the internal assets, protect and prevent the intrusions

2) TOE is located at the connection point between an external network and internal network where it detects intrusions of network traffic in real time and performs prevention function.

3) TOE provides the following functions: an intrusion detection function that collects, analyzes, and reacts to, the activity data; a function to control unauthorized traffic; live update function; a function to identify and authenticate users attempting to access the TOE; and an audit function to record an administrator's activities within the TOE.

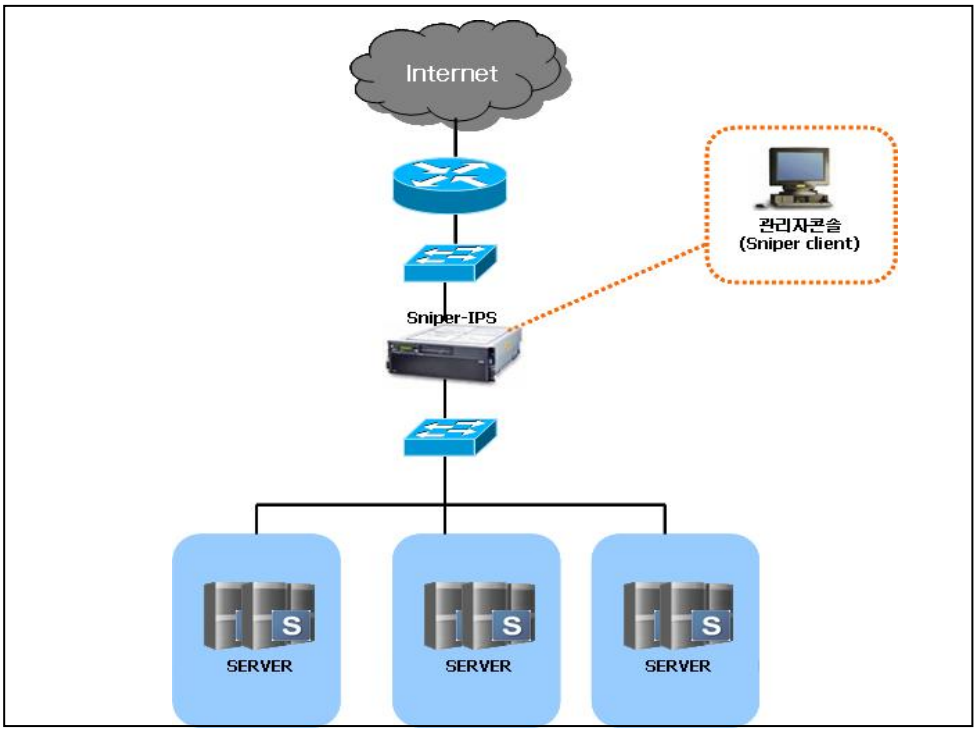
2.2 TOE Environment

2.2.1 IT Environment

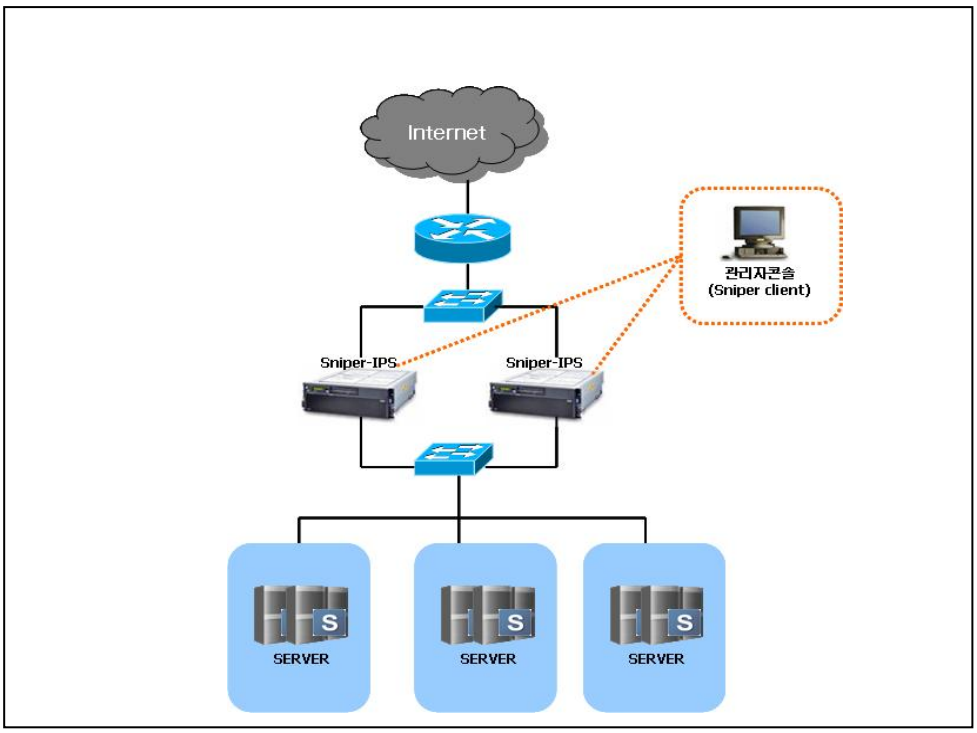
TOE IT Environment includes Update Server, NTP (Network Time Protocol) Server, and ESM/SNIPER ITMS etc. SNIPER and NTP Server communicate using Network Time protocol. For a secure communication, SNIPER communicates using identification and authentication data, internally transmitted data and area or SNIPER Client of the distant place and SSL protocol.

2.2.2 Network Environment

An objective for the main functions of TOE is a dynamic countermeasure towards network attacks.



[Image 1] TOE Network Environment



[Image 2] TOE Network Environment (HA)

According to the two following methods, the TOE can be installed and operated either at the connection point of the internet and internal network or at the point where the network is divided into the external and internal network and then operated through the following methods.
As it appears in (Image 2), the TOE is independently installed and operated in an In-line mode at the point where the network is divided into the external and internal network

Two TOE units can also be installed and operated in an In-line mode at the point where the network is divided into the external and internal network as it appears in (Image 3).

SNIPER Client manages the TOE locally or remotely.

2.3 TOE Boundary

2.3.1 Physical Scope

SNIPER, where the TOE is included, consists of a dedicated hardware system (SNIPER engine) and SNIPER Client. The following table summarizes the hardware specifications of them.

Physical scope and boundary of the TOE is SNIPER IPS Server and SNIPER IPS Client.

SNIPER IPS V6.0.e is mounted on SNIPER IPS E2000 and SNIPER IPS E4000.

Hardware requirements for the TOE are indicated below.

		SNIPER Server(H/W Type)				SNIPER Client
Operation System		SNIPER OS V1.0				MS Windows XP Professional (Install IE 7.0 or higher)
Model		E2000		E4000		•
Spec.	CPU	Intel Xeon DP CPU 3.0㎓ × 2		Intel Xeon DP CPU 3.6 ㎓ × 2		Intel Pentium IV 1.8㎒ or higher compatible version
	Memory	2G DDR-Ⅱ		2G DDR-Ⅱ		512 MB or more
	HDD	SATA 200GB		3.5” 73GB(SCSI) × 2		40 GB or more
	DOM	512MB		512MB		•
Number of Port	Management	10/100/1000 Mbps	1 Port	10/100/1000 Mbps	1 Port	10/100 NIC 1 or more
	HA	10/100/1000 Mbps	1 Port	10/100/1000 Mbps	1 Port	
	L7 HA	•	•	10/100/1000 Mbps	2Port	
	Packet Gathering Port	1000 Mbps	4 Port	1000 Mbps	4 Port	
Features	SNIPER Client installs automatically after downloading OCXs from SNIPER Server. Client PC should also be equipped with 1024 X 768 or higher resolution monitor, sound card, and speaker.					

[Table-2] Physical Scope

DOM (Disk on Module) is a high-performance embedded flash memory data storage system.

HDD is used for storing the log.

SNIPER IPS V6.0e (E2000) supports 1 management port (10/100/1000Mbps), 1 HA port (10/100/1000Mbps), and 4 packet gathering ports (1000Mbps).

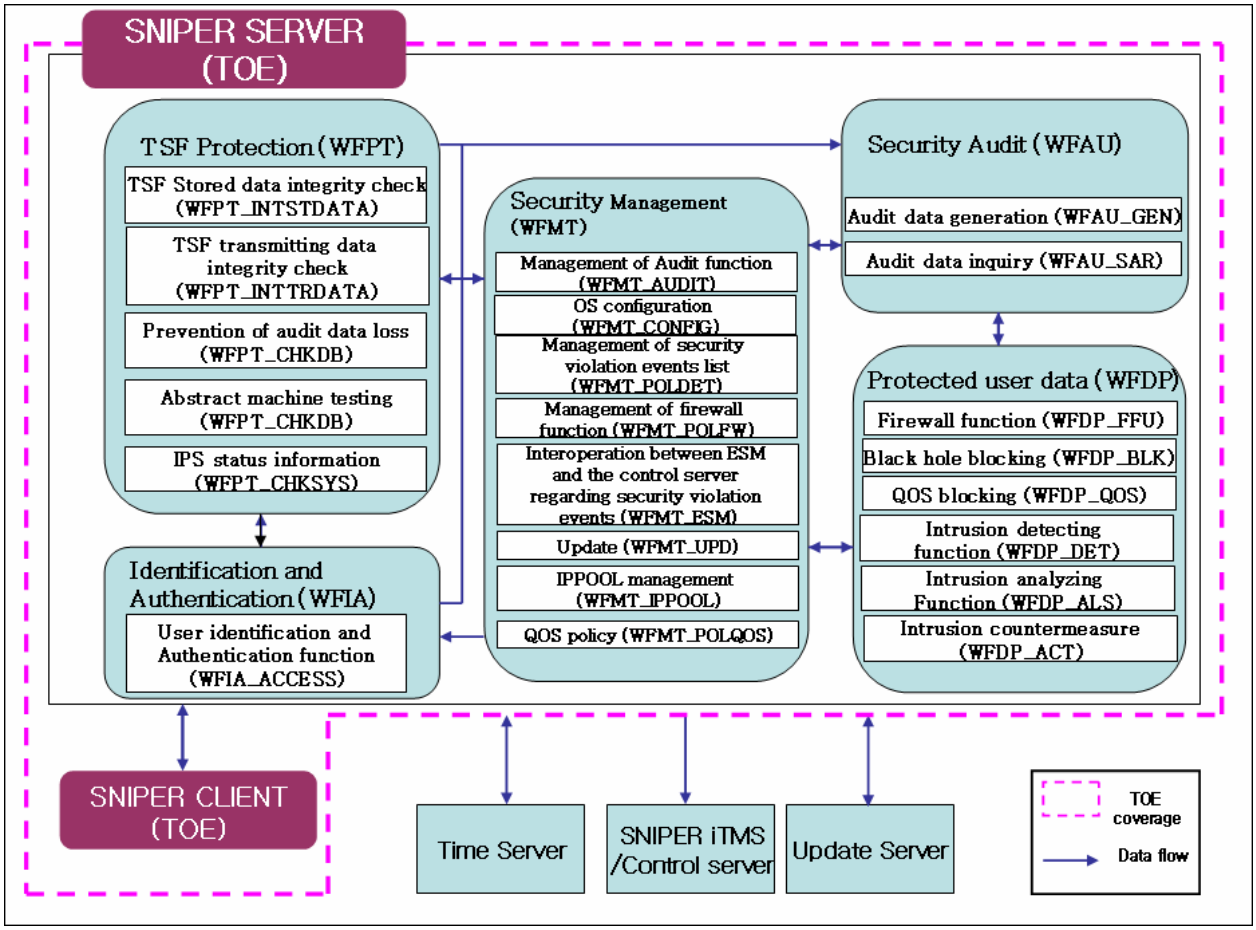
Similarly, SNIPER IPS V6.0e (E4000) supports 1 management port (10/100/1000Mbps), 1 HA port

(10/100/1000Mbps), 4 packet gathering ports (1000Mbps) and additional 2 L7 HA ports (10/100/1000Mbps).

2 packet gathering ports operate in a single pair to handle a single network.

Management Console must support SSL 128bit.

2.3.2 Logical Scope



[Image 3] Sub-systems of the TOE

Logical scope of SNIPER is like the followings.

• Security Audit (WFAU)

Security audit sub-system operates a function of Audit data generation (WFAU_GEN) and Audit data inquiry (WFAU_SAR). This function collects and analyzes the record history of the system use to check whether the system is operating stably and efficiently. The audit result is used for detecting or blocking intrusions on the computer system and for detecting misuse of the system.

• User Data Protection (WFDP)

User Data Protection sub-system operates Firewall function (WFDP_FFU), Blackhole block (WFDP_BLK),

QoS block (WFDP_QOS), Intrusion Detecting function (WFDP_DET), Intrusion Analyzing function (WFDP_ALS), and Intrusion Countermeasure function (WFDP_ACT). This function controls the flow of network data according to the permission or blocking rule to protect the target network that is to be protected from internal or external attackers. Also it collects information to detect intrusion and react to an intrusion in case it is identified, and stores the analysis result so that the administrator can check.

• Identification and Authentication (WFIA)

Identification and Authentication sub-system operates user identification and authentication process (WFIA_ACCESS).

Only authorized administrators are allowed to access key functions that are essential to the regular operation of SNIPER such as changing, deleting and adding policies and retrieving log files. In order to control the access to SNIPER perfectly, every access attempt through an administrator interface are examined to identify and authenticate an appropriate administrator. The communication between SNIPER Client and the engine is encrypted using SSL and its integrity is verified through SHA-1 to prevent any modification or exposure of the data.

Even with the access of an authorized administrator, if not operate for a certain period of time; protect the TOE during the inactive terms of an authorized administrator by locking up the interacting sessions.

• Security Management (WFMT)

Security Management sub-system operates Security audit Management(WFMT_AUDIT), OS Configuration(WFMT_CONFIG), Management of Security Violation List (WFMT_POLDET), Firewall function Management(WFMT_POLFW), Management of Interoperation between ESM and the Control Server regarding security violation events (WFMT_ESM), IP POOL Management (WFMT_IPPOOL), Update(WFMT_UPD), and QoS Policy(WFMT_POLQOS). Security Management function provides the rules for detection/prevention SNIPER performs and the managerial actions retrieving and modifying information related to the state and configuration of SNIPER.

• TSF Protection (WFPT)

TSF Protection sub-system operates TSF stored data Integrity check (WFPT_INTSTDATA), TSF transmitting data Integrity check (WFPT_INTTRDATA), Prevention of audit data loss (WFPT_CHKDB), and Abstract machine testing (WFPT_ATM). TSF Protection provides a regular check function to assure that the security assumptions related to the underlying abstract machine are properly operating. It performs checking when initially started, periodically during normal operation, and upon request of an authorized user to decide whether the main components running on the TOE system are normally operating in order. It also preserves a secure state when failure occurred and ensures safe operation of the TOE by periodical monitoring.

2.3.3 Unevaluated functions

Following functions are not included in the TOE boundary.

- Report functions (Crystal Report)
- Chart functions (Bar/Pie)
- Preview functions via Quick Report
- Exporting to Excel
- Openssl v0.9.7m

3. TOE Security Environment

3.1 Assumption

The following conditions are assumed to exist in the TOE operational environment.

Assumption	Description
A.Physical Security	TOE is located in a physically safe environment where the authorized users may only access.
A.Security Maintenance	Security level of the TOE should remain intact even when the local network environment alters due to change in network structure, increase/decrease of hosts, service, and etc.
A.Trusted Administrator	An authorized administrator of the TOE possesses no malicious intention, is adequately educated, and performs his/her duties in accordance with the administrative guideline.
A. Hardened OS	The underlying OS of the TOE ensures the reliability and stability by both eliminating the unnecessary services or means not required by the TOE and installing the OS patches.
A.Single Connection Point	The TOE is installed and operated on a network and separates the network into external and internal network. Information can not flow between the two without passing through the TOE.
A. Secure TOE external server	The network time protocol (NTP) server which maintains a trusted time outside the TOE for security functions of the TOE and the update server which provides the latest attack pattern rules are secure.
A.TIME	The IT environment of the TOE is provided with a reliable Timestamp from the NTP server which conforms to RFC 1305 or from the OS.
A.TOE SSL Certificate	The TOE, when installing the certificate that will be used for SSL authentication, generates in advance and stores at the TOE. SSL Certificate of the TOE is safely generated and managed.

[Table-3] Assumption

3.2 Threats

Threats are categorized into threats to the TOE and threats about the TOE operational environment.

1) Threats of the TOE

Threats are generally known as IT entities or users that attempt illegal access to the TOE or endangers within the TOE system. Threats are considered to have low standard of expertise, resources, and motivation.

Threats	Description
T.Masquerade	A threat agent may masquerade as an authenticated administrator and therefore can obtain access to the TOE.
T.Failure	Due to a failure or an attack, the TOE, while in operation, may not be able to provide proper services to users.
T.Audit Failure	Auditable events of the TOE may not be logged due to audit storage capacity exhaustion.
T.Unauthorized Service Access	A threat agent may gain access to a service unauthorized to internal network hosts, and disturb the proper offering of its service.
T. Inbound Illegal Information	A computer in the internal network may be tampered or attacked by incoming a malicious packet from an external network containing unauthorized information.
T.Abnormal Packet Transfer	A threat agent may transfer network packets of anomaly structure to cause abnormal operations..
T. New Vulnerability Attack	A threat agent may attack by exploiting a new vulnerability of a computer system in the internal network of the TOE or the TOE operational environment.
T.Denial of Service	A threat agent may exhaust service resources of a computer in the internal network in the TOE operational environment and disturb authorized users' use of services.
T. Replay Attack	A threat agent may gain access to the TOE by attempting authentication repeatedly.
T. Bypassing Attack	A threat agent may gain access to the TOE by bypassing security functions of the TOE.
T. Spoofing IP Address	A threat agent may illegitimately gain access to the internal network by spoofing source IP address as an internal address.
T. Unauthorized TSF Data Modification	A threat agent may attack by launching a buffer overflow attack, thus resulting in unauthorized modification of the TSF data.

[Table-4] Identification of Threats

2) Threats to the TOE Operational Environment

Threat	Description
TE. Poor Administration	The TOE may be configured, administered, or operated in an insecure manner by an authorized administrator.
TE. Distribution and Installation	The TOE may be damaged during its distribution or installation process.

[Table-5] Threats to the TOE Operational Environment

3.3 Organizational Security Policy

This chapter addresses the organizational security policies managed by the TOE.

Policy	Description
P.Audit	Auditable events must be recorded and maintained to trace the responsibility of all security related actions, and the recorded data must be reviewed.
P. Secure Administration	An authorized administrator must manage the TOE in a secure manner.
P. SSL Certificate Administration	SNIPER must store and manage when safely creating SSL Certificate.

[Table-6] Organizational Security Policy

4. Security Objectives

Security objectives are categorized into objectives for the TOE and objectives for the environment. Security objectives for the TOE are managed by the TOE and security objectives for the environment by IT sector or non technical/procedural means.

4.1 TOE Security Objectives

Following table indicates security objectives that need to be handled directly by the TOE

Security Objectives	Description
O.Availability	In the case of an accidental breakdown or a failure caused by an external attack, the TOE must be able to maintain minimum security functions and provide regular services.
O.Audit	The TOE must provide a means to record, store and review security-relevant events in audit records to trace the responsibility of all actions regarding security.
O.Management	The TOE must provide administrative tools to enable authorized administrators to effectively manage and maintain the TOE.
O. Abnormal Packet Block	The TOE must block abnormal packets from all the packets that pass through the TOE.
O. DoS Attack Blocking	The TOE, when an attacker abnormally uses service assets of a computer, must block the use to protect the network service of the protecting computer for normal users.
O.Identification	The TOE must identify all external IT entities subject to information flow control of the TOE and the users who want to access to the TOE.
O.Authentication	The TOE, after identifying an administrator, must authenticate the administrator's identity before granting an access to the TOE.
O.Information Flow Control	The TOE must control unauthorized information flow from the external network to the internal network based on security policies.
O.TSF Data Protection	The TOE must protect stored TSF data from unauthorized disclosure, modification, or deletion.

[Table-7] TOE Security Objectives

4.2 Security Objectives for Environment

Followings are the security objectives handled by the IT field or non-technical/procedural means.

Security Objectives	Description
OE.Physical Security	TOE should locate in a physically secure environment where the authorized users may only access.
OE.Security Maintenance	When the internal network environment is changed due to network configuration changes, an increase or decrease of hosts, or an increase or decrease of services, the new changes must be immediately noted and security policies configured in accordance with the TOE operational policy to maintain the same level of security as before.
OE.Trusted Administrator	An authorized administrator of the TOE possesses no malicious intention, is adequately educated, and performs his/her duties in accordance with the administrative guideline.
OE.Secure Administration	The TOE must be distributed and installed securely, and must be configured, administered, and used in a secure manner.
OE.Hardened OS	The underlying OS of the TOE ensures the reliability and stability by both eliminating the unnecessary services or means not required by the TOE and installing the OS patches.
OE.Single connection point	The TOE, when installed and operated on a network, separates the network into the internal and external network. All communication between the two is done through the TOE.
OE.Vulnerability List Update	The administrator must update and control the vulnerability data managed by the TOE to defend external attacks exploiting new vulnerabilities of an internal computer.
OE.Secure TOE external server	The network time protocol (NTP) server which maintains a trusted time outside the TOE for security functions of the TOE, update server (provides the latest attack pattern rules), SNIPER iTMS (Control Server) should be secure.
OE.TIME	The IT environment of the TOE should be provided with a reliable Timestamp from the NTP server which conforms to RFC 1305 or from the OS.
OE.SSL protocol	The TOE mutually certificates through SSL Certificate, Administrator ID and Password using SSL protocol, and therefore protects the transmitting TSF data.

[Table-8] Security Objectives for Environment

5. IT Security Requirements

The security functional requirements defined in this document have selected related functional components drawn from CC Part 2 to satisfy the security objective identified in the previous chapter. The intended level of the TOE strength of function (SOF) is SOF-medium. Supposing that the function is to provide adequate protection for organizational computer resources and information from external threats, and that the expected attack potential of the threat agent is to be medium, the required strength of function (SOF) is defined as SOF-medium.

The conventions used in this document are consistent with the Common Criteria for IT Security Evaluation.
Operations permitted to be performed on security functional requirements are iteration, selection, refinement, and assignment.

- **Iteration**

  Allows a component to be used more than once with varying operations. The result of iteration operation is indicated by appending the repeated number in parenthesis, (repeated number), following the component identifier.

- **Selection**

  Used to select one or more items provided by the Common Criteria for IT Security Evaluation when stating a requirement. The result of selection operation is indicated in underlined italics.

- **Refinement**

  Used to add details to and thus further restricts a requirement. The result of refinement operation is indicated by bold text.

- **Assignment**

  Used to assign a specific value to an unspecified parameter (e.g. password length). The result of assignment operation is indicated by putting the value in square brackets, [assignment_value].

5.1 SNIPER Functional Requirements

The TOE security functional components addressed in this document are summarized in the following table.

Security functional class	Security functional component
FAU (Audit)	FAU_ARP.1 Security alarms
	FAU_GEN.1 Audit data generation
	FAU_GEN.2 User identity association
	FAU_SAA.1 Potential violation analysis
	FAU_SAR.1 Audit review
	FAU_SAR.3 Selectable audit review
	FAU_SEL.1 Selective audit
	FAU_STG.1 Protected audit trail storage
	FAU_STG.3 Action in case of possible audit data loss
	FAU_STG.4 Prevention of audit data loss
FDP (User data protection)	FDP_IFC.1(1) Subset information flow control(1)
	FDP_IFC.1(2) Subset information flow control(2)
	FDP_IFC.1(3) Subset information flow control(3)
	FDP_IFC.1(4) Subset information flow control (4)
	FDP_IFF.1(1) Simple security attributes(1)
	FDP_IFF.1(2) Simple security attributes(2)
	FDP_IFF.1(3) Simple security attributes(3)
	FDP_IFF.1(4) Simple security attributes(4)
FIA (Identification and authentication)	FIA_AFL.1 Authentication failure handling
	FIA_ATD.1(1) User attribute definition(1)
	FIA_ATD.1(2) User attribute definition(2)
	FIA_UAU.1 Timing of authentication
	FIA_UAU.4 Reuse Prevention authentication mechanism
	FIA_UAU.7 Protected authentication feedback
	FIA_UID.2(1) User identification before any action(1)
	FIA_UID.2(2) User identification before any action(2)
FMT (Security management)	FMT_MOF.1 Management of security functions behavior
	FMT_MSA.1 Management of security attributes
	FMT_MSA.3 Static attribute initialization
	FMT_MTD.1(1) Management of TSF data(1)
	FMT_MTD.1(2) Management of TSF data(2)
	FMT_MTD.1(3) Management of TSF data(3)
	FMT_MTD.1(4) Management of TSF data(4)
	FMT_MTD.2(1) Management of limits on TSF data(1)
	FMT_MTD.2(2) Management of limits on TSF data(2)
	FMT_SMF.1 Specification of Management Functions
	FMT_SMR.1 Security roles
FPT (Protection of the TSF)	FPT_AMT.1 Abstract machine testing
	FPT_FLS.1 Failure with preservation of secure state

	FPT_RVM.1 Non-bypassability of the TSP
	FPT_SEP.1 TSF domain separation
	FPT_STM.1 Reliable time stamps
	FPT_TST.1 TSF testing
FRU (Resource utilization)	FRU_FLT.1 Degraded fault tolerance
	FRU_RSA.1 Maximum quotas
FTA (TOE access)	FTA_SSL.1 TSF-initiated session locking
	FTA_SSL.3 TSF-initiated termination
FTP (Trusted path/channels)	FTP_ITC.1 Inter-TSF trusted channel

[Table-9] Security functional requirements

5.1.1 Audit

5.1.1.1 FAU_ARP.1 Security alarms

Hierarchical to: No other components

FAU_ARP.1.1 The TSF, when detects potential security violation, shall take [List of actions to minimize the following problems {Sending mails to the authorized administrator, warning screen, terminating session}]

Dependencies: FAU_SAA.1 Potential violation analysis

5.1.1.2 FAU_GEN.1 Audit data Generation

Hierarchical to: No other components

FAU_GEN.1.1 The TSF shall be able to generate an audit record of the following auditable events.

a) Start-up and shutdown of the audit functions.

b) All auditable events for the minimum level of audit.

c) [None]

FAU_GEN.1.2 The TSF shall record within each audit record at least the following information.

a) Date and time of the event, type of event, subject identity, and the outcome (Success or failure) of the event

b) For each audit event type, based on the auditable event definitions of the functional components included in the Protection Profile (PP) / Security Target (ST), Auditable events information based on the definition [None].

Dependencies: FPT_STM.1 Reliable time stamps

5.1.1.3 FAU_GEN.2 User identity association

Hierarchical to: No other components

FAU_GEN.2.1 The TSF shall be able to associate each auditable event with the identity of the user that caused the event.

Dependencies: FAU_GEN.1 Audit data generation

FIA_UID.1 Timing of identification

5.1.1.4 FAU_SAA.1 Potential violation analysis

Hierarchical to: No other components.

FAU_SAA.1.1 The TSF shall be able to apply a set of rules in monitoring the audited events and based upon these rules indicate a potential violation of the TSP.

FAU_SAA.1.2 The TSF shall enforce the following rules for monitoring audited events.

a) Accumulation or combination of the followings known as indicating potential security violation [

- Insufficient capacity of the stored medium warning
- Excess of the access attempt limits configured by an administrator
- Integrity errors warning
- Packet Drop due to an excessive traffic
- An overload reaching more than 90% on CPU remains more than 3 minutes
- Problems occurred at NIC]

b) [No additional rules]

Dependencies: FAU_GEN.1 Audit data generation

5.1.1.5 FAU_SAR.1 Audit Review

Hierarchical to: No other components.

FAU_SAR.1.1 The TSF shall provide [authorized administrator] with the capability to read [all audit data] from the audit records.

FAU_SAR.1.2 The TSF shall provide the audit records in a manner suitable for the user to interpret the information.

Dependencies: FAU_GEN.1 Audit data generation

5.1.1.6 FAU_SAR.3 Selectable audit review

Hierarchical to: No other components.

FAU_SAR.3.1 The TSF shall provide the ability to perform *searches, ordering* of audit data based on [Type of events, time, and results]

Dependencies: FAU_SAR.1 Audit review

5.1.1.7 FAU_SEL.1 Selective audit

Hierarchical to: No other components.
FAU_SEL.1.1 The TSF shall be able to include or exclude auditable events from the set of audited events based on the following attributes.
a) *Victim identity, user identity, subject identity, host identity, event type*
b) [Classify the internal and external network hosts according to network sections]
Dependencies: FAU_GEN.1 Audit data generation
FMT_MTD.1 Management of TSF data

5.1.1.8 FAU_STG.1 Protected audit trail storage

Hierarchical to: No other components.
FAU_STG.1.1 The TSF shall protect the stored audit records from unauthorized deletion.
FAU_STG.1.2 The TSF shall be able to *prevent* unauthorized modifications to the audit records in the audit trail.
Dependencies: FAU_GEN.1 Audit data generation

5.1.1.9 FAU_STG.3 Action in case of possible audit data loss

Hierarchical to: No other components.
FAU_STG.3.1 The TSF shall take [actions to alert the authorized administrator, suspend Logging towards the descriptive DB, send E-mails to the authorized administrator, indicate warning messages in case of possible audit storage failure] if the audit trail exceeds [90% of the stored medium usage limit configured by the authorized administrator].
Dependencies: FAU_STG.1 Protected audit trail storage

5.1.1.10 FAU_STG.4 Prevention of audit data loss

Hierarchical to: FAU_STG.3
FAU_STG.4.1 The TSF shall *prevent auditable events, except those taken by the authorized user with special rights* and [Modify Firewall policy to DROP when the capacity of the stored medium is less than 100MB] if the audit trail is full.
Dependencies: FAU_STG.1 Protected audit trail storage

5.1.2 User Data Protection

5.1.2.1 FDP_IFC.1 (1) Subset information flow control (1)

Hierarchical to: No other components.

FDP_IFC.1.1 The TSF shall enforce the [**Firewall Policy**] on list of subjects, information, and operations that cause controlled information to flow to and from controlled subjects covered by the SFP.

a) [subjects: unauthenticated external IT entities that send information;

b) Information: traffic sent through the TOE from one subject to another;

C) operation: pass information when allowing rules exist].

Dependencies: FDP_IFF.1 Simple security attributes

5.1.2.2 FDP_IFC.1 (2) Subset information flow control (2)

Hierarchical to: No other components.

FDP_IFC.1.1 The TSF shall enforce the [**Blackhole policy**] on list of subjects, information, and operations that cause controlled information to flow to and from controlled subjects covered by the SFP.

a) [subjects: unauthenticated external IT entities that send information;

b) Information: traffic sent through the TOE from one subject to another;

C) operation: block information when blocking rules exist].

Dependencies: FDP_IFF.1 Simple security attributes

5.1.2.3 FDP_IFC.1 (3) Subset information flow control (3)

Hierarchical to: No other components.

FDP_IFC.1.1 The TSF shall enforce the [**QoS policy**] on list of subjects, information, and operations that cause controlled information to flow to and from controlled subjects covered by the SFP.

a) [Subject: authenticated external IT entities that send information

b) Information: traffic sent through the TOE from one subject to another

c) Operation: decrease bandwidth when the traffic exceeds the threshold set in the QoS policy]

Dependencies: FDP_IFF.1 Simple security attributes

5.1.2.4 FDP_IFC.1 (4) Subset information flow control (4)

Hierarchical to: No other components.

FDP_IFC.1.1 The TSF shall enforce the [**Intrusion Analysis Policy**] on list of subjects, information, and operations that cause controlled information to flow to and from controlled subjects covered by the SFP.

a) [Subject: authenticated external IT entities that send information

b) Information: traffic sent through the TOE from one subject to another

c) Operation: Block when the traffic meets the Pattern Block, corresponds to the Attack Accepted Count/Time, exceeds the limit]

Dependencies: FDP_IFF.1 Simple security attributes

5.1.2.5 FDP_IFF.1 (1) Simple security attributes (1)

Hierarchical to: No other components.

FDP_IFF.1.1 The TSF shall enforce the [Firewall policy] based on at least the following types of subject and information security attributes: [list of subjects and information]

a) Subject security attribute: IP addresses of external IT entities that send/receive information, Administrator

b) Information security attributes:

- Departure address
- Destination address
- Protocol
- Port

FDP_IFF.1.2 The TSF shall allow information flow between the controlled subject and information through the controlled operation if the following rules were maintained: [Following rules]

- Allow if the external IT entities and information (Departure address, Destination address, Protocol, Port) that send/receive information via TOE are identical to the sessions registered on the whitehole table
- Allow if the external IT entities and information (Departure address, Destination address, Protocol, Port) that send/receive information via TOE are identical to the sessions registered on the CPList via stateful inspection
- Allow if the external IT entities and information (Departure address, Destination address, Protocol, Port) that send/receive information via TOE are identical to the sessions allowed to pass via ACCEPT rules of the firewall

FDP_IFF.1.3 The TSF shall enforce [none]

FDP_IFF.1.4 The TSF shall enforce [none].

FDP_IFF.1.5 The TSF shall explicitly authorize the information flow based on [One-way Information flow where the departure address is TOE]]

FDP_IFF1.6 The TSF shall explicitly deny the information flow based on the following rules.

a) [The TOE must block access request of the information transmitted from the external network IT entity including internal subject IP address.

b) The TOE must block access request of the information transmitted from the internal network IT entity including external subject IP address.

c) The TOE must block access request of the information transmitted from the external network IT entity that includes broadcasting subject IP address.

d) The TOE must block access request of the information transmitted from the external network IT entity that includes broadcasting loofing subject IP address.

e) The TOE must block access request of the information transmitted from the external network IT entity that includes abnormal packet structure.

f) [No other components]

Dependencies: FDP_IFC.1 Subset information flow control

FMT_MSA.3 Static attribute initialization

Warning: FDP_IFF1.6 iterates overall functions of the TOE.

5.1.2.6 FDP_IFF.1 (2) Simple security attributes (2)

Hierarchical to: No other components

FDP_IFF.1.1 The TSF shall enforce the [Blackhole policy] based on at least the following types of subject and information security attributes: [list of subjects and information]

a) Subject security attribute: IP address of the external IT entities that send/receive information, Administrator

b) Information security attributes:

- Departure address
- Destination address
- Protocol
- Port

FDP_IFF.1.2 The TSF shall allow the information flow between controlled subject and information by the controlled operation if the following rules were maintained: [Following rules]

- In case rules mentioned in FDP_IFF.1.3 do not correspond to any rules

FDP_IFF.1.3 The TSF shall enforce [Allow information flow when the following rules exist].

- When the session reaching the attack accepted count was generated during the attack accepted time that was defined by an administrator authorized at a single departing address (terminate the corresponding session)
- TCP/UDP Time Out: 1 Hour, Session Full: When exceeded 150,000 session (DROP exceeded session)
- History registered by an administrator at the Realtime block list.
- When exceeded TCP/UDP session termination time set by an authorized administrator.
- Block access network when internet use of the IT entity was set to ‘Banned’.
- Block access network when it was classified to harmful site and set to ‘block’
- Block access network when the session was blocked by the administrator

FDP_IFF.1.4 The TSF shall provide [None].

FDP_IFF.1.5 The TSF shall explicitly authorize the information flow based on [One-way information flow where its departing point is TOE]

FDP_IFF1.6 The TSF shall explicitly deny the information flow according to the following rules.

a) [The TOE must block access request of the information transmitted from the external network IT entity

including internal subject IP address.

b) The TOE must block access request of the information transmitted from the internal network IT entity including external subject IP address.

c) The TOE must block access request of the information transmitted from the external network IT entity that includes broadcasting subject IP address.

d) The TOE must block access request of the information transmitted from the external network IT entity that includes broadcasting loofing subject IP address.

e) The TOE must block access request of the information transmitted from the external network IT entity that includes abnormal packet structure.

f) [None]

Dependencies: FDP_IFC.1 Subset information flow control

FMT_MSA.3 Static attribute initialization

Warning: FDP_IFF1.6 iterates overall functions of the TOE.

5.1.2.7 FDP_IFF.1 (3) Simple security attributes (3)

Hierarchical to: No other components

FDP_IFF.1.1 The TSF shall enforce the [QoS policy] based on at least the following types of subject and information security attributes: [list of subjects and information].

a) Subject security attribute: IP address of the external IT entities that send/receive information

b) Information security attributes:

- Departure address
- Destination address
- Protocol
- Port
- Threshold value

FDP_IFF.1.2 The TSF shall allow the information flow between controlled subject and information by the controlled operation if the following rules were maintained: [Following rules]

- Allow when the external IT entity that sends/receive information via the TOE and the information (Departure address, Destination address, Protocol, Port, Threshold value) is less than the threshold value configured in the QoS policy of FMT_SMF.1.

FDP_IFF.1.3 The TSF shall enforce [none].

FDP_IFF.1.4 The TSF shall provide [none].

FDP_IFF.1.5 The TSF shall explicitly authorize the information flow based on [None]

FDP_IFF1.6 The TSF shall explicitly deny the information flow based on the following rules.

a) [The TOE shall block a request for network access of the information from external network IT entities has internal subject IP addresses.

b) The TOE shall block a request for network access of the information from internal network IT entities

has external subject IP addresses.

c) The TOE shall block a request for network access of the information from external network IT entities have broadcasting subject IP addresses.

d) The TOE shall block a request for network access of the information from external network IT entities have loofing subject IP addresses.

e) The TOE shall block a request for network access of the information from external network IT entities have abnormal packet structures.

f) [No other components]

Dependencies: FDP_IFC.1 Subset information flow control

FMT_MSA.3 Static attribute initialization

Warning: FDP_IFF1.6 iterates overall functions of the TOE.

5.1.2.8 FDP_IFF.1 (4) Simple security attributes (4)

Hierarchical to: No other components

The TSF shall enforce the [Intrusion Analysis policy] based on at least the following types of subject and information security attributes: [list of subjects and information].

a) Subject security attribute: IP address of the external IT entities that send/receive information

b) Information security attributes:

- Protocol
- Port
- Attack Accepted Count
- Attack Accepted Time
- Access limit Time
- Detection String pattern

FDP_IFF.1.2 The TSF shall allow the information flow between controlled subject and information by the controlled operation if the following rules were maintained: [Following rules]

- When authorized to access after comparing security violation events list with Pattern Block list.
- When the incoming attack was defined upon its attack accepted count and time, but did not correspond to any of those.
- When the traffic is not abnormally exceeding

FDP_IFF.1.3 The TSF shall enforce [None].

FDP_IFF.1.4 The TSF shall provide [None].

FDP_IFF.1.5 The TSF shall explicitly authorize the information flow based on [One-way information flow where the departing point is TOE]

FDP_IFF.1 The TSF shall explicitly deny the information flow based on the following rules.

a) [The TOE shall block a request for network access of the information from external network IT entities has internal subject IP addresses.

b) The TOE shall block a request for network access of the information from internal network IT entities has external subject IP addresses.
c) The TOE shall block a request for network access of the information from external network IT entities have broadcasting subject IP addresses.
d) The TOE shall block a request for network access of the information from external network IT entities have loofing subject IP addresses.
e) The TOE shall block a request for network access of the information from external network IT entities have abnormal packet structures.
f) [No other components]
Dependencies: FDP_IFC.1 Subset information flow control
FMT_MSA.3 Static attribute initialization
Warning: FDP_IFF1.6 iterates overall functions of the TOE.

5.1.3 Identification and Authentication

5.1.3.1 FIA_AFL.1 Authentication failure handling

Hierarchical to: No other components
FIA_AFL.1.1 The TSF shall detect when [1~3] unsuccessful authentication attempts related to [the authentication of TOE use for the administrator] occur.
FIA_AFL.1.2 when the defined number of unsuccessful authentication attempts has been met or surpassed, the TSF shall perform [the prevention of the user authentication until an action is taken by the authorized administrator, Access limit to the user ID for 30 seconds to the SNIPER server, report to the administrator mail]
Dependencies: FIA_UAU.1 Authentication

5.1.3.2 FIA_ATD.1 (1) User attribute definition (1)

Hierarchical to: No other components
FIA_ATD.1.1 The TSF shall maintain the following list of security attributes belonging to each IT entity: [the following security attributes].
a) IP address
b) {No other components}
Dependencies: No dependencies

5.1.3.3 FIA_ATD.1 (2) User attribute definition (2)

Hierarchical to: No other components

FIA_ATD.1.1 The TSF shall maintain the following list of security attributes belonging to each IT entity: [the following security attributes].

a) Identifier

b) {User ID, Password, Term of Validity, Authority and Information on the other administrators, number of unsuccessful authentication }

Dependencies: None

Application notes: Administrator classifies into Super administrator, security administrator, and administrator. Each administrator has unique authority.

• Super administrator: Consist of 1 person. Performs overall functions of SNIPER.

• Security administrator: Capable of managing Realtime monitoring, Recent monitoring, Detection/Defense/Alarm, Realtime block list, General report, Help menu. Cannot use configuration function. May only query history during the audit.

• Administrator: Capable of managing Monitoring, Recent monitoring, detection/defense/alarm, and help menu. Cannot use Configuration, security, and audit function.

5.1.3.4 FIA_UAU.1 Authentication

Hierarchical to: No other components

FIA_UAU.1.1 The TSF shall allow [Administrator's IP that may access beforehand must be registered and must acquire the certificate. A login screen in which ID and password are entered is operated. Access ID and password provided as default must be modified by the administrator.] to be performed by the administrator before the administrator is authenticated.

FIA_UAU.1.2 The TSF shall require each administrator to be successfully authenticated before allowing any other TSF-mediated actions than those specified in FIA_UAU.1.1 on behalf of that administrator.

Dependencies: FIA_UID.1 Identification.

Application notes: Administrator classifies into Super administrator, security administrator, and administrator. Each administrator has unique authority.

- Super administrator: Consist of 1 person. Performs overall functions of SNIPER.
- Security administrator: Capable of managing Realtime monitoring, Recent monitoring, Detection/Defense/Alarm, Realtime block list, General report, Help menu. Security administrator may not use configuration function. He may only query history during the audit.
- Administrator: Capable of managing Monitoring, Recent monitoring, detection/defense/alarm, and help menu. Cannot use Configuration, security, and audit function.

5.1.3.6 FIA_UAU.7 Protected authentication feedback

Hierarchical to: No other components

FIA_UAU.7.1 The TSF shall provide only [the result of authentication (success/failure), and asterisks, not

the original character, for each password character to be displayed through the GUI, not the original character] to the administrator while the authentication is in progress.

Dependencies: FIA_UAU.1 Authentication

Application notes: Administrator classifies into Super administrator, security administrator, and administrator. Each administrator has unique authority.

- Super administrator: Consist of 1 person. Performs overall functions of SNIPER.
- Security administrator: Capable of managing Realtime monitoring, Recent monitoring, Detection/Defense/Alarm, Realtime block list, General report, Help menu. Security administrator may not use configuration function. He may only query history during the audit.
- Administrator: Capable of managing Monitoring, Recent monitoring, detection/defense/alarm, and help menu. Cannot use Configuration, security, and audit function.

5.1.3.7 FIA_UID.2 (1) User identification before any action (1)

Hierarchical to: FIA_UID.1

FIA_UID.2.1 The TSF shall require each administrator to identify himself/herself before allowing any other TSF-mediated actions on behalf of that administrator.

Dependencies: no dependencies

5.1.3.8 FIA_UID.2 (2) User identification before any action (2)

Hierarchical to: FIA_UID.1

FIA_UID.2.1 The TSF shall require each administrator to identify himself/herself before allowing any other TSF-mediated actions on behalf of that administrator.

Dependencies: no dependencies

Application notes: Administrator classifies into Super administrator, security administrator, and administrator. Each administrator has unique authority.

- Super administrator: Consist of 1 person. Performs overall functions of SNIPER.
- Security administrator: Capable of managing Realtime monitoring, Recent monitoring, Detection/Defense/Alarm, Realtime block list, General report, Help menu. Security administrator may not use configuration function. He may only query history during the audit.
- Administrator: Capable of managing Monitoring, Recent monitoring, detection/defense/alarm, and help menu. Cannot use Configuration, security, and audit function.

5.1.4 Security Management

5.1.4.1 FMT_MOF.1 Management of security functions behavior

Hierarchical to: No other components

FMT_MOF.1.1 The TSF shall restrict [the following] ability to [the authorized administrator]..

Security Function	Super Administrator	Security Administrator	Administrator
Audit	Configure, End, Start, Modify	-	-
Configuration	Configure, End, Start, Modify	-	-
Security Violation Events Management	Configure, End, Start, Modify	-	-
Firewall Management	Configure, End, Start, Modify	-	-
Interoperation Management (ESM Control Server)	Configure, End, Start, Modify	-	-
IP POOL Management	Configure, Modify	-	-
Update	Configure, Modify	-	-
QoS Policy	Configure, End, Start, Modify	-	-
IPS Status Information	Configure, End, Start, Modify	-	-

[Table-10] Security Function Management

Dependencies: FMT_SMR.1 Security roles

FMT_SMF.1 Specification of management functions

5.1.4.2 FMT_MSA.1 Management of security attributes

Hierarchical to: No other components

FMT_MSA.1.1 The TSF shall enforce [Firewall policy, Blackhole policy, and QoS policy, Intrusion Analyzing policy] to restrict the ability to *change_default, query, modify[create]* [the following] security attributes to [the authorize administrator].

Security Attribute	Action
Denial of Service	Change default, Query, Modify
Information Gathering	Change default, Query, Modify
Protocol Vulnerability	Change default, Query, Modify
Service Attack	Change default, Query, Modify
WebCGI Attack	Change default, Query, Modify, Delete, Create
Backdoor	Change default, Query, Modify, Delete, Create
User Define	Query, Modify, Delete, Create

Protocol Statistics Analysis	Change default, Query, Modify
Service Statistics Analysis	Change default, Query, Modify, Delete, Create
IP Statistics Analysis	Change default, Query, Modify
PATTERN BLOCK	Change default, Query, Modify, Delete, Create
Firewall Policy	Query, Modify
Firewall Policy Interface (Inboound/Outbound/Any)	Query, Modify
Firewall Policy Source IP	Query, Modify
Firewall Policy Destination IP	Query, Modify
Firewall Policy Service (Port, protocol)	Query, Modify
Firewall Policy (ACCECPT/DROP)	Query, Modify
Firewall Policy Log	Query, Modify
Firewall Policy Description	Query, Modify
QoS Policy Interface (Inbound/Outbond)	Query, Modify
QoS Policy Application	Query, Modify
QoS Policy Type (bps/pps by Total/Protocol/Service)	Query, Modify
QoS Policy Protocol	Query, Modify
QoS Policy Port	Query, Modify
QoS Policy Threshold	Query, Modify
QoS Policy Description	Query, Modify
Default Blackhole policy of the Internet use (Accept/Drop)	Query, Modify
Blackhole Policy MAC address	Query, Modify
Blackhole Policy IP address	Query, Modify
Blackhole Policy Hostname	Query, Modify
Blackhole Policy Routing Function (Yes/No)	Query, Modify
Blackhole Policy (Accept/Drop)	Query, Modify
Blackhole Policy Time Setting	Query, Modify
Blackhole Policy Search Key	Query, Modify

[Table-11] Security Attribute Management

Dependencies: [FDP_IFC.1 Subset Information Flow Control]
FMT_SMF.1 Specification of management functions
FMT_SMR.1 Security roles

5.1.4.5 FMT_MSA.3 Static Attribute Initialization

Hierarchical to: No other components

FMT_MSA.3.1 The TSF shall enforce the [firewall policies, Blackhole policies] to provide *restrictive* default values for security attributes that are used to enforce the SFP.

FMT_MSA.3.2 The TSF shall allow the [authorized administrator] to specify alternative initial values to override the default values when the target or information is created.

Dependencies: FMT_MSA.1 Security attributes management

FMT_SMR.1 Security roles

Application notes: Super administrator may only operate.

5.1.4.6 FMT_MTD.1 (1) Management of TSF data (1)

Hierarchical to: No other components

FMT_MTD.1.1 The TSF shall restrict the ability to *change_default, query, modify, delete, erase, [null]* the [firewall policy, Alarm rules] to [the authorized administrator].

Dependencies: FMT_SMF.1 Specification of management functions

FMT_SMR.1 Security roles

Application notes: The firewall policy shall only be configured by 'Super administrator', an administrator with full authorities. The alarm rules may only be configured by 'Super administrator', 'Security administrator', and 'Administrator'.

5.1.4.7 FMT_MTD.1 (2) Management of TSF data (2)

Hierarchical to: No other components

FMT_MTD.1.1 The TSF shall restrict the ability to *change_default, query, modify, delete, erase, [create]* the [Attack pattern among blackhole policies] to [the authorized administrator].

Dependencies: FMT_SMF.1 Specification of management functions

FMT_SMR.1 Security roles

Application notes: The blackhole policy shall only be configured by 'Super administrator', an administrator with full authorities. The alarm rules may only be configured by 'Super administrator', 'Security administrator', and 'Administrator'.

5.1.4.8 FMT_MTD.1 (3) Management of TSF data (3)

Hierarchical to: No other components

FMT_MTD.1.1 The TSF shall restrict the ability to *change_default, query* [the followings] to [the super administrator].

- The TOE Timestamp used when tracing the Audit list.
- Session Time-out value of the authorized administrator
- Audit list related configuration value
- Auto Update cycle

Dependencies: FMT_SMF.1 Specification of management functions

FMT_SMR.1 Security roles

5.1.4.9 FMT_MTD.1 (4) Management of TSF data (4)

Hierarchical to: No other components

FMT_MTD.1.11 The TSF shall restrict the ability to *query, modify* [the following] to [the authorized administrator].

• TCP/UDP Session Time out

Dependencies: FMT_SMF.1 Specification of management functions

FMT_SMR.1 Security roles

Application notes: Administrator classifies into Super administrator, security administrator, and administrator. Each administrator has unique authority.

• Super administrator: Consist of 1 person. Performs overall functions of SNIPER.

• Security administrator: Capable of managing Realtime monitoring, Recent monitoring, Detection/Defense/Alarm, Realtime block list, General report, Help menu. Cannot use configuration function. Can only inquire essential search history during the audit.

• Administrator: Capable of managing Monitoring, Recent monitoring, detection/defense/alarm, and help menu. Cannot use Configuration, security, and audit function.

5.1.4.10 FMT_MTD.2 (1) Management of limits on TSF data (1)

Hierarchical to: No other components

FMT_MTD.2.1 The TSF shall restrict the specification of the limits for [audit trail capacity] to [the authorized administrator].

FMT_MTD.2.2 The TSF shall perform [the actions specified at FAU_STG.3, FAU_STG.4] if the TSF data are at, or exceed, the designated limits

Dependencies: FMT_MTD.1 Management of TSF Data

FMT_SMR.1 Security roles

5.1.4.11 FMT_MTD.2 (2) Management of limits on TSF data (2)

Hierarchical to: No other components

FMT_MTD.2.1 The TSF shall restrict the specification of the limits for the [Number of unsuccessful authentication attempts] to [the authorized administrator].

FMT_MTD.2.2 The TSF shall perform [the actions specified at FIA_AFL.1] if the TSF data are at, or exceed, the designated limits.

Dependencies: FMT_MTD.1 Management of TSF Data

FMT_SMR.1 Security roles

5.1.4.12 FMT_SMF.1 Specification of management functions

Hierarchical to: No other components

FMT_SMF.1.1 The TSF shall be capable of performing the following security management functions.

[

a) Management of TSF function

- Item indicated at FMT_MOF.1

b) Management of TSF security attributes

- Item indicated at FMT_MSA.1

c) Management of TSF data

- Item indicated at FMT_MTD.1

d) Management of TSF data limit

- Item indicated at FMT_MTD.2

e) Management of security role

- Item indicated at FMT_SMR.1]

Dependencies: No dependencies

5.1.4.13 FMT_SMR.1 Security Roles

Hierarchical to: No other components

FMT_SMR.1.1 The TSF shall maintain the roles [Super administrator, Security administrator, Administrator].

FMT_SMR.1.2 The TSF shall be able to associate users with the roles of an authorized administrator.

Dependencies: FIA_UID.1 Identification

Application notes: Administrator classifies into Super administrator, security administrator, and administrator. Each administrator has unique authority.

- Super administrator: Consist of 1 person. Performs overall functions of SNIPER.
- Security administrator: Capable of managing Realtime monitoring, Recent monitoring, Detection/Defense/Alarm, Realtime block list, General report, Help menu. Cannot use configuration function. Can only inquire essential search history during the audit.
- Administrator: Capable of managing Monitoring, Recent monitoring, detection/defense/alarm, and help menu. Cannot use Configuration, security, and audit function.

5.1.5 Protection of the TSF

5.1.5.1 FPT_AMT.1 Abstract machine testing

Hierarchical to: No other components

FPT_AMT.1.1 The TSF shall run a suite of tests *during initial start-up, periodically during normal operation,*

at the request of an authorized user to demonstrate the correct operation of the security assumptions provided by the abstract machine that underlies the TSF.
Dependencies: No dependencies

5.1.5.2 FPT_FLS.1 Failure with preservation of secure state

Hierarchical to: No other components
FPT_FLS.1.1 The TSF shall preserve a secure state when the following types of failures occur.
[Types of failures list described in **FRU_FLT.1**].
Dependencies: ADV_SPM.1 Informal TOE security policy model

5.1.5.3 FPT_RVM.1 Non-bypassability of the TSP

Hierarchical to: No other components
FPT_RVM.1.1 The TSF shall ensure that TSP enforcement functions are invoked and succeed before each function within the TSC is allowed to proceed.
Dependencies: No dependencies

5.1.5.4 FPT_SEP.1 TSF domain separation

Hierarchical to: No other components
FPT_SEP.1.1 The TSF shall maintain a security domain for its own execution that protects it from interference and tampering by untrusted subjects.
FPT_SEP.1.2 The TSF shall enforce separation between the security domains of subjects in the TSC.
Dependencies: No dependencies

5.1.5.5 FPT_STM.1 Reliable time stamps

Hierarchical to: No other components
FPT_STM.1.1 The TSF shall be able to provide reliable time stamps for its own use.
Dependencies: No dependencies

5.1.5.6 FPT_TST.1 TSF testing

Hierarchical to: No other components
FPT_TST.1.1 The TSF shall run a suite of self tests *during initial start-up, periodically during the normal operation, at the request of the authorized user* to demonstrate the correct operation of *TSF data*.
FPT_TST.1.2 The TSF shall provide authorized administrators with the capability to verify the integrity of [*TSF data*].

FPT_TST.1.3 The TSF shall provide authorized administrators with the capability to verify the integrity of stored TSF executable code.
Dependencies: FPT_AMT.1 Abstract machine testing

5.1.6 Resource Utilization

5.1.6.1 FRU_FLT.1 Degraded fault tolerance

Hierarchical to: No other components
FRU_FLT.1.1 The TSF shall ensure the operation of [the administrator's management using the console or security management screen] when the following failures occur: [failure of network interface, error of major process].
Dependencies: FPT_FLS.1 Failure with preservation of secure state

5.1.6.2 FRU_RSA.1 Maximum quotas

Hierarchical to: No other components
FRU_RSA.1.1 The TSF shall enforce maximum quotas of the following resources: [transport layer demonstration] that *the group of defined IT entities* can use *over a specified period of time*.
Dependencies: No dependencies

5.1.7 TOE Access

5.1.7.1 FTA_SSL.1 TSF-initiated session locking

Hierarchical to: No other components
FTA_SSL.1.1 According to the following rules, the TSF shall lock the session that interacts after when [the client screen of SNIPER does not activate for a certain period of time designated by **the authorized administrator** or there are no inputs from the keyboard and mouse.]
a) Clearing or overwriting display devices, making the current contents unreadable;
b) Disabling any activity of the authorized administrator's data access/display devices other than unlocking the session.
FTA_SSL.1.2 The TSF shall require the following events to occur prior to unlocking the session: [user re-authentication].
Dependencies: FIA_UAU.1 Authentication

5.1.7.2 FTA_SSL.3 TSF-initiated session termination

Hierarchical to: No other components

FTA_SSL.3.1 The TSF shall terminate the session that interacts after the following.

- When the TCP/UDP session time-out of an authorized IT enitity has exceeded the TCP/UDP session termination time designated by an authorized administrator at FMT_MTD.1.

Dependencies: No dependencies

5.1.8 Trusted Path/Channels

5.1.8.1 FTP_ITC.1 Inter-TSF trusted channel

Hierarchical to: No other components

FTP_ITC.1.1 The TSF shall provide a communication channel between itself and a remote trusted IT product that is logically distinct from other communication channels and provides assured identification of its end points and protection of the channel data from modification or disclosure.

FTP_ITC.1.2 The TSF shall permit *the TSF, A trusted remote IT product* to initiate communication via the trusted channel.

FTP_ITC.1.3 The TSF shall initiate communication via the trusted channel for [the update of security violation events list].

Dependencies: No dependencies

Application notes: The TOE forms SSL protocol by invoking SSL function provided to IT environment, and therefore provides the trusted channel.

5.2 Additional Security Functional Requirements

The following components were added on this document, in addition to the Network Intrusion Prevention System PP history.

Security Functional Class	Security functional components
Identification and Authentication	FIA_UAU.4(Additional) Reuse prevention authentication mechanism

[Table-12] Additional Security Functional Requirements

5.2.1 FIA_UAU.4 Reuse prevention authentication mechanism

Hierarchical to: No other components

FIA_UAU.4.1 The TSF shall prevent the reuse of authentication data that is related to the [Encrypted communication between the SNIPER server and SNIPER user through SSL, one-time password].

Dependencies: No dependencies

5.3 SNIPER Assurance Requirements

Security assurance requirements of the TOE are composed of assurance components in Part 3 and meet EAL4 assurance level. The assurance components addressed in this document are summarized in the following table.

Assurance Class	Assurance Component	
Configuration Management	ACM_AUT.1	Partial CM automation
	ACM_CAP.4	Generation support and acceptance procedures
	ACM_SCP.2	Problem tracking CM coverage
Distribution and Operation	ADO_DEL.2	Detection of modification
	ADO_IGS.1	Installation, generation and start-up procedures
Development	ADV_FSP.2	Fully defined external interfaces
	ADV_HLD.2	Security enforcing high-level design
	ADV_IMP.1	Subset of the implementation of the TSF
	ADV_LLD.1	Descriptive low-level design
	ADV_RCR.1	Informal correspondence demonstration
	ADV_SPM.1	Informal TOE security policy model
Manual	AGD_ADM.1	Administrator guidance
	AGD_USR.1	User guidance
Life Cycle Support	ALC_DVS.1	Identification of security measures
	ALC_LCD.1	Developer defined life-cycle model
	ALC_TAT.1	Well-defined development tools
Tests	ATE_COV.2	Analysis of coverage
	ATE_DPT.1	Testing: high-level design
	ATE_FUN.1	Functional testing
	ATE_IND.2	Independent testing - sample
Vulnerability Analysis	AVA_MSU.2	Validation of analysis
	AVA_SOF.1	Strength of TOE security function evaluation
	AVA_VLA.2	Independent vulnerability analysis

[Table-13] Assurance Requirements

5.3.1 Configuration Management

5.3.1.1 ACM_AUT.1 Partial CM Automation

- Dependencies:
  - ACM_CAP.3 Authorization controls
- Developer action elements
  - ACM_AUT.1.1D The developer shall use a CM system.
  - ACM_AUT.1.2D The developer shall provide a CM plan.

• Content and presentation of evidence elements

- ACM_AUT.1.1C The CM system shall provide an automated means by which only authorized changes are made to the TOE implementation representation.
- ACM_AUT.1.2C The CM system shall provide an automated means to support the generation of the TOE.
- ACM_AUT.1.3C The CM plan shall describe the automated tools used in the CM system.
- ACM_AUT.1.4C The CM plan shall describe how the automated tools are used in the CM system.

• Evaluator action elements

- ACM_AUT.1.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

5.3.1.2 ACM_CAP.4 Generation support and acceptance procedures

• Dependencies:

- ALC_DVS.1 Identification of security measures

• Developer action elements

- ACM_CAP.4.1D The developer shall provide a reference for the TOE.
- ACM_CAP.4.2D The developer shall use a CM system.
- ACM_CAP.4.3D The developer shall provide CM documentation.

• Content and presentation of evidence elements

- ACM_CAP.4.1C The reference for the TOE shall be unique to each version of the TOE.
- ACM_CAP.4.2C The TOE shall be labeled with its reference.
- ACM_CAP.4.3D The developer shall provide CM documentation.

• Content and presentation of evidence elements

- ACM_CAP.4.1C The reference for the TOE shall be unique to each version of the TOE.
- ACM_CAP.4.2C The TOE shall be labeled with its reference.
- ACM_CAP.4.3C The configuration list shall uniquely identify all configuration items that comprise the TOE.
- ACM_CAP.4.4C The CM documentation shall include a configuration list, a CM plan, and an acceptance plan.
- ACM_CAP.4.5C The configuration list shall describe the configuration items that comprise the TOE.
- ACM_CAP.4.6C The CM documentation shall describe the method used to uniquely identify the configuration items.
- ACM_CAP.4.7C The CM system shall uniquely identify all configuration items.
- ACM_CAP.4.8C The CM plan shall describe how the CM system is used.
- ACM_CAP.4.9C The evidence shall demonstrate that the CM system is operating in accordance with the CM plan.
- ACM_CAP.4.10C The CM documentation shall provide evidence that all configuration items have

been and are being effectively maintained under the CM system.

- ACM_CAP.4.11C The CM system shall provide measures such that only authorized changes are made to the configuration items.

- ACM_CAP.4.12C The CM system shall support the generation of the TOE.

- ACM_CAP.4.13C The acceptance plan shall describe the procedures used to accept modified or newly created configuration items as part of the TOE.

• Evaluator action elements

- ACM_CAP.4.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

5.3.1.3 ACM_SCP.2 Problem tracking CM coverage

• Dependencies:

- ACM_CAP.3 Authorization controls

• Developer action elements

- ACM_SCP.2.1D The developer shall provide a list of configuration items for the TOE.

• Content and presentation of evidence elements

- ACM_SCP.2.1C The list of configuration items shall include the following: implementation representation; security flaws; and the evaluation evidence required by the assurance components in the ST.

• Evaluator action elements

- ACM_SCP.2.1E 1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

5.3.2 Distribution and Operation

5.3.2.1 ADO_DEL.2 Detection of modification

• Dependencies:

- ACM_CAP.3 Authorization controls

• Developer action elements

- ADO_DEL.2.1D developer shall document procedures for delivery of the TOE or parts of it to the user.

- ADO_DEL.2.2D The developer shall use the delivery procedures.

• Content and presentation of evidence elements

- ADO_DEL.2.1C The delivery documentation shall describe all procedures that are necessary to maintain security when distributing versions of the TOE to a user's site.

- ADO_DEL.2.2C The delivery documentation shall describe how the various procedures and technical measures provide for the detection of modifications, or any discrepancy between the

developer's master copy and the version received at the user site.

- ADO_DEL.2.3C The delivery documentation shall describe how the various procedures allow detection of attempts to masquerade as the developer, even in cases in which the developer has sent nothing to the user's site.

• Evaluator action elements

- ADO_DEL.2.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

5.3.2.2 ADO_IGS.1 Installation, generation, and start-up procedures

• Dependencies:

- AGD_ADM.1 Administrator guidance

• Developer action elements

- ADO_IGS.1.1D The developer shall document procedures necessary for the secure installation, generation, and start-up of the TOE.

• Content and presentation of evidence elements

- ADO_IGS.1.1C The installation, generation and start-up documentation shall describe all the steps necessary for secure installation, generation and start-up of the TOE.

• Evaluator action elements

- ADO_IGS.1.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

- ADO_IGS.1.2E The evaluator shall determine that the installation, generation, and start-up procedures result in a secure configuration.

5.3.3 Development

5.3.3.1 ADV_FSP.2 fully defined external interfaces

• Dependencies:

- ADV_RCR.1 Informal correspondence demonstration

• Developer action elements

- ADV_FSP.2.1D The developer shall provide a functional specification.

• Content and presentation of evidence elements

- ADV_FSP.2.1C The functional specification shall describe the TSF and its external interfaces using an informal style.

- ADV_FSP.2.2C The functional specification shall be internally consistent.

- ADV_FSP.2.3C The functional specification shall describe the purpose and method of use of all external TSF interfaces, providing complete details of all effects, exceptions and error messages.

- ADV_FSP.2.4C The functional specification shall completely represent the TSF.

- ADV_FSP.2.5C The functional specification shall include rationale that the TSF is completely represented.

• Evaluator action elements

- ADV_FSP.2.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.
- ADV_FSP.2.2E The evaluator shall determine that the functional specification is an accurate and complete instantiation of the TOE security functional requirements.

5.3.3.2 ADV_HLD.2 Security enforcing high-level design

• Dependencies:

- ADV_FSP.1 Informal functional specification
- ADV_RCR.1 Informal correspondence demonstration

• Developer action elements

- ADV_HLD.2.1D The developer shall provide the high-level design of the TSF.

• Content and presentation of evidence elements

- ADV_HLD.2.1C The presentation of the high-level design shall be informal.
- ADV_HLD.2.2C The high-level design shall be internally consistent.
- ADV_HLD.2.3C The high-level design shall describe the structure of the TSF in terms of subsystems.
- ADV_HLD.2.4C The high-level design shall describe the security functionality provided by each subsystem of the TSF.
- ADV_HLD.2.5C The high-level design shall identify any underlying hardware, firmware, and/or software required by the TSF with a presentation of the functions provided by the supporting protection mechanisms implemented in that hardware, firmware, or software.
- ADV_HLD.2.6C The high-level design shall identify all interfaces to the subsystems of the TSF.
- ADV_HLD.2.7C The high-level design shall identify which of the interfaces to the subsystems of the TSF are externally visible.
- ADV_HLD.2.8C The high-level design shall describe the purpose and method of use of all interfaces to the subsystems of the TSF, providing details of effects, exceptions and error messages, as appropriate.
- ADV_HLD.2.9C The high-level design shall describe the separation of the TOE into TSP enforcing and other subsystems.

• Evaluator action elements

- ADV_HLD.2.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.
- ADV_HLD.2.2E The evaluator shall determine that the high-level design is an accurate and complete instantiation of the TOE security functional requirements.

5.3.3.3 ADV_IMP.1 Subset of the implementation of the TSF

• Dependencies:

- ADV_LLD.1 Descriptive low-level design
- ADV_RCR.1 Informal correspondence demonstration
- ALC_TAT.1 Well-defined development tools

• Developer action elements

- ADV_IMP.1.1D The developer shall provide the implementation representation for a selected subset of the TSF.

• Content and presentation of evidence elements

- ADV_IMP.1.1C The implementation representation shall unambiguously define the TSF to a level of detail such that the TSF can be generated without further design decisions.
- ADV_IMP.1.2C The implementation representation shall be internally consistent.

• Evaluator action elements

- ADV_IMP.1.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.
- ADV_IMP.1.2E The evaluator shall determine that the least abstract TSF representation provided is an accurate and complete instantiation of the TOE security functional requirements.

5.3.3.4 ADV_LLD.1 Descriptive low-level design

• Dependencies:

- ADV_HLD.2 Security enforcing high-level design
- ADV_RCR.1 Informal correspondence demonstration

• Developer action elements

- ADV_LLD.1.1D The developer shall provide the low-level design of the TSF.

• Content and presentation of evidence elements

- ADV_LLD.1.1C The presentation of the low-level design shall be informal.
- ADV_LLD.1.2C The low-level design shall be internally consistent.
- ADV_LLD.1.3C The low-level design shall describe the TSF in terms of modules.
- ADV_LLD.1.4C The low-level design shall describe the purpose of each module.
- ADV_LLD.1.5C The low-level design shall define the interrelationships between the modules in terms of provided security functionality and dependencies on other modules.
- ADV_LLD.1.6C The low-level design shall describe how each TSP-enforcing function is provided.
- ADV_LLD.1.7C The low-level design shall identify all interfaces to the modules of the TSF.
- ADV_LLD.1.8C The low-level design shall identify which of the interfaces to the modules of the TSF are externally visible.
- ADV_LLD.1.9C The low-level design shall describe the purpose and method of use of all interfaces to the modules of the TSF, providing details of effects, exceptions and error messages,

as appropriate.

- ADV_LLD.1.10C The low-level design shall describe the separation of the TOE into TSP-enforcing and other modules.

• Evaluator action elements

- ADV_LLD.1.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

- ADV_LLD.1.2E The evaluator shall determine that the low-level design is an accurate and complete instantiation of the TOE security functional requirements.

5.3.3.5 ADV_RCR.1 Informal correspondence demonstration

• Dependencies: No dependencies

• Developer action elements

- ADV_RCR1.1D The developer shall provide an analysis of correspondence between all adjacent pairs of TSF representations that are provided.

• Content and presentation of evidence elements

- ADV_RCR.1.1C For each adjacent pair of provided TSF representations, the analysis shall demonstrate that all relevant security functionality of the more abstract TSF representation is correctly and completely refined in the less abstract TSF representation.

• Evaluator action elements

- ADV_RCR.1.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

5.3.3.6 ADV_SPM.1 Informal TOE security policy model

• Dependencies:

- ADV_FSP.1 Informal functional specification

• Developer action elements

- ADV_SPM.1.1D The developer shall provide a TSP model.

- ADV_SPM.1.2D The developer shall demonstrate correspondence between the functional specification and the TSP model.

• Content and presentation of evidence elements

- ADV_SPM.1.1C The TSP model shall be informal.

- ADV_SPM.1.2C The TSP model shall describe the rules and characteristics of all policies of the TSP that can be modeled.

- ADV_SPM.1.3C The TSP model shall include a rationale that demonstrates that it is consistent and complete with respect to all policies of the TSP that can be modeled.

- ADV_SPM.1.4C The demonstration of correspondence between the TSP model and the functional specification shall show that all of the security functions in the functional specification are consistent and complete with respect to the TSP model.

• Evaluator action elements

- ADV_SPM.1.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

5.3.4 Manual

5.3.4.1 AGD_ADM.1 Administrator Guidance

• Dependencies:

- ADV_FSP.1 Informal functional specification

• Developer action elements

- AGD_ADM.1.1D The developer shall provide administrator guidance addressed to system administrative personnel.

• Content and presentation of evidence elements

- AGD_ADM.1.1C The administrator guidance shall describe the administrative functions and interfaces available to the administrator of the TOE.

- AGD_ADM.1.2C The administrator guidance shall describe how to administer the TOE in a secure manner.

- AGD_ADM.1.3C The administrator guidance shall contain warnings about functions and privileges that should be controlled in a secure processing environment.

- AGD_ADM.1.4C The administrator guidance shall describe all assumptions regarding user behavior that are relevant to secure operation of the TOE.

- AGD_ADM.1.5C The administrator guidance shall describe all security parameters under the control of the administrator, indicating secure values as appropriate.

- AGD_ADM.1.6C The administrator guidance shall describe each type of security-relevant event relative to the administrative functions that need to be performed, including changing the security characteristics of entities under the control of the TSF.

- AGD_ADM.1.7C The administrator guidance shall be consistent with all other documentation supplied for evaluation.

- AGD_ADM.1.8C The administrator guidance shall describe all security requirements for the IT environment that are relevant to the administrator.

• Evaluator action elements

- AGD_ADM.1.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

5.3.4.2 AGD_USR.1 User guidance

• Dependencies:

- ADV_FSP.1 Informal functional specification

• Developer action elements

- AGD_USR.1.1D The developer shall provide user guidance.

• Content and presentation of evidence elements

- AGD_USR.1.1C The user guidance shall describe the functions and interfaces available to the non-administrative users of the TOE.
- AGD_USR.1.2C The user guidance shall describe the use of user-accessible security functions provided by the TOE.
- AGD_USR.1.3C The user guidance shall contain warnings about user accessible functions and privileges that should be controlled in a secure processing environment.
- AGD_USR.1.4C The user guidance shall clearly present all user responsibilities necessary for secure operation of the TOE, including those related to assumptions regarding user behavior found in the statement of TOE security environment.
- AGD_USR.1.5C The user guidance shall be consistent with all other documentation supplied for evaluation.
- AGD_USR.1.6C The user guidance shall describe all security requirements for the IT environment that are relevant to the user.

• Evaluator action elements

- AGD_USR.1.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

5.3.5 Life Cycle Support

5.3.5.1 ALC_DVS.1 Identification of security measures

• Dependencies: No dependencies

• Developer action elements

- ALC_DVS.1.1D The developer shall produce development security documentation.

• Content and presentation of evidence elements

- ALC_DVS.1.1C The development security documentation shall describe all the physical, procedural, personnel, and other security measures that are necessary to protect the confidentiality and integrity of the TOE design and implementation in its development environment.
- ALC_DVS.1.2C The development security documentation shall provide evidence that these security measures are followed during the development and maintenance of the TOE.

• Evaluator action elements

- ALC_DVS.1.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.
- ALC_DVS.1.2E The evaluator shall confirm that the security measures are being applied.

5.3.5.2 ALC_LCD.1 Developer defined life-cycle model

• Dependencies: No dependencies

• Developer action elements

- ALC_LCD.1.1D The developer shall establish a life-cycle model to be used in the development and maintenance of the TOE.

- ALC_LCD.1.2D The developer shall provide life-cycle definition documentation.

• Content and presentation of evidence elements

- ALC_LCD.1.1C The life-cycle definition documentation shall describe the model used to develop and maintain the TOE.

- ALC_LCD.1.2C The life-cycle model shall provide for the necessary control over the development and maintenance of the TOE.

• Evaluator action elements

- ALC_LCD.1.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

5.3.5.3 ALC_TAT.1 Well-defined development tools

• Dependencies:

- ADV_IMP.1 Subset of the implementation of the TSF

• Developer action elements

- ALC_TAT.1.1D The developer shall identify the development tools being used for the TOE.

- ALC_TAT.1.2D The developer shall document the selected implementation dependent options of the development tools.

• Content and presentation of evidence elements

- ALC_TAT.1.1C All development tools used for implementation shall be well defined.

- ALC_TAT.1.2C The documentation of the development tools shall unambiguously define the meaning of all statements used in the implementation.

- ALC_TAT.1.3C The documentation of the development tools shall unambiguously define the meaning of all implementation-dependent options.

• Evaluator action elements

- ALC_TAT.1.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

5.3.6 Tests

5.3.6.1 ATE_COV.2 Analysis of coverage

• Dependencies:

- ADV_FSP.1 Informal functional specification

- ATE_FUN.1 Functional testing

• Developer action elements

- ATE_COV.2.1D The developer shall provide an analysis of the test coverage.

• Content and presentation of evidence elements

- ATE_COV.2.1C The analysis of the test coverage shall demonstrate the correspondence between the tests identified in the test documentation and the TSF as described in the functional specification.

- ATE_COV.2.2C The analysis of the test coverage shall demonstrate that the correspondence between the TSF as described in the functional specification and the tests identified in the test documentation is complete.

• Evaluator action elements

- ATE_COV.2.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

5.3.6.2 ATE_DPT.1 high-level design

• Dependencies:

- ADV_HLD.2 Security enforcing high-level design
- ADV_LLD.1 Security enforcing high-level design
- ATE_FUN.1 Functional testing

• Developer action elements

- ATE_DPT.1.1D The developer shall provide the analysis of the depth of testing.

• Content and presentation of evidence elements

- ATE_DPT.1.1C The depth analysis shall demonstrate that the tests identified in the test documentation are sufficient to demonstrate that the TSF operates in accordance with its high-level design.

• Evaluator action elements

- ATE_DPT.1.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

5.3.6.3 ATE_FUN.1 Functional testing

• Dependencies: No dependencies

• Developer action elements

- ATE_FUN.1.1D The developer shall test the TSF and document the results.
- ATE_FUN.1.2D The developer shall provide test documentation.

• Content and presentation of evidence elements

- ATE_FUN.1.1C The test documentation shall consist of test plans, test procedure descriptions, expected test results and actual test results.
- ATE_FUN.1.2C The test plans shall identify the security functions to be tested and describe the goal of the tests to be performed.

- ATE_FUN.1.3C The test procedure descriptions shall identify the tests to be performed and describe the scenarios for testing each security function. These scenarios shall include any ordering dependencies on the results of other tests.
- ATE_FUN.1.4C The expected test results shall show the anticipated outputs from a successful execution of the tests.
- ATE_FUN.1.5C The test results from the developer execution of the tests shall demonstrate that each tested security function behaved as specified.

• Evaluator action elements

- ATE_FUN.1.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

5.3.6.4 ATE_IND.2 Independent testing – sample

• Dependencies:

- ADV_FSP.1 Informal functional specification
- AGD_ADM.1 Administrator guidance
- AGD_USR.1 User guidance
- ATE_FUN.1 Functional testing

• Developer action elements

- ATE_IND.2.1D The developer shall provide the TOE for testing.

• Content and presentation of evidence elements

- ATE_IND.2.1C The TOE shall be suitable for testing.
- ATE_IND.2.2C The developer shall provide an equivalent set of resources to those that were used in the developer's functional testing of the TSF.

• Evaluator action elements

- ATE_IND.2.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.
- ATE_IND.2.2E The evaluator shall test a subset of the TSF as appropriate to confirm that the TOE operates as specified.
- ATE_IND.2.3E The evaluator shall execute a sample of tests in the test documentation to verify the developer test results.

5.3.7 Vulnerability assessment

5.3.7.1 AVA_MSU.2 Validation of analysis

• Dependencies:

- ADO_IGS.1 Installation, generation, and start-up procedures
- ADV_FSP.1 Informal functional specification

- AGD_ADM.1 Administrator guidance
- AGD_USR.1 User guidance

• Developer action elements

- AVA_MSU.2.1D The developer shall provide guidance documentation.
- AVA_MSU.2.2D The developer shall document an analysis of the guidance documentation.

• Content and presentation of evidence elements

- AVA_MSU.2.1C The guidance documentation shall identify all possible modes of operation of the TOE (including operation following failure or operational error), their consequences and implications for maintaining secure operation.
- AVA_MSU.2.2C The guidance documentation shall be complete, clear, consistent and reasonable.
- AVA_MSU.2.3C The guidance documentation shall list all assumptions about the intended environment.
- AVA_MSU.2.4C The guidance documentation shall list all requirements for external security measures (including external procedural, physical and personnel controls).
- AVA_MSU.2.5C The analysis documentation shall demonstrate that the guidance documentation is complete.

• Evaluator action elements

- AVA_MSU.2.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.
- AVA_MSU.2.2E The evaluator shall repeat all configuration and installation procedures and other procedures selectively, to confirm that the TOE can be configured and used securely using only the supplied guidance documentation.
- AVA_MSU.2.3E The evaluator shall determine that the use of the guidance documentation allows all insecure states to be detected.
- AVA_MSU.2.4E The evaluator shall confirm that the analysis documentation shows that guidance is provided for secure operation in all modes of operation of the TOE.

5.3.7.2 AVA_SOF.1 Strength of TOE security function evaluation

• Dependencies:

- ADV_FSP.1 Informal functional specification
- ADV_HLD.1 Descriptive high-level design

• Developer action elements

- AVA_SOF.1.1D The developer shall perform strength of TOE security function analysis for each mechanism identified in the ST as having strength of TOE security function claim.

• Content and presentation of evidence elements

- AVA_SOF.1.1C For each mechanism with strength of TOE security function claim the strength of TOE security function analysis shall show that it meets or exceeds the minimum strength level defined in the PP/ST.

- AVA_SOF.1.2C For each mechanism with a specific strength of TOE security function claim the strength of TOE security function analysis shall show that it meets or exceeds the specific strength of function metric defined in the PP/ST

• Evaluator action elements

- AVA_SOF.1.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

- AVA_SOF.1.2E The evaluator shall confirm that the strength claims are correct.

5.3.7.3 AVA_VLA.2 Independent vulnerability analysis

• Dependencies:

- ADV_FSP.1 Informal functional specification

- ADV_HLD.2 Security enforcing high-level design

- ADV_IMP.1 Subset of the implementation of the TSF

- ADV_LLD.1 Descriptive low-level design

- AGD_ADM.1 Administrator guidance

- AGD_USR.1 User guidance

• Developer action elements

- AVA_VLA.2.1D The developer shall perform a vulnerability analysis.

- AVA_VLA.2.2D The developer shall provide vulnerability analysis documentation.

• Content and presentation of evidence elements

- AVA_VLA.2.1C The vulnerability analysis documentation shall describe the analysis of the TOE deliverables performed to search for ways in which a user can violate the TSP.

- AVA_VLA.2.2C The vulnerability analysis documentation shall describe the disposition of identified vulnerabilities.

- AVA_VLA.2.3C The vulnerability analysis documentation shall show, for all identified vulnerabilities, that the vulnerability cannot be exploited in the intended environment for the TOE.

- AVA_VLA.2.4C The vulnerability analysis documentation shall justify that the TOE, with the identified vulnerabilities, is resistant to obvious penetration attacks.

• Evaluator action elements

- AVA_VLA.2.1E The evaluator shall confirm that the information provided meets all requirements for content and presentation of evidence.

- AVA_VLA.2.2E The evaluator shall conduct penetration testing, building on the developer vulnerability analysis, to ensure the identified vulnerabilities have been addressed.

- AVA_VLA.2.3E The evaluator shall perform an independent vulnerability analysis.

- AVA_VLA.2.4E The evaluator shall perform independent penetration testing, based on the independent vulnerability analysis, to determine the exploitability of additional identified vulnerabilities in the intended environment.

- AVA_VLA.2.5E The evaluator shall determine that the TOE is resistant to penetration attacks

performed by an attacker possessing a low attack potential.

5.4 IT Security requirement for the IT environment

The following is the security requirement for the IT environment.

5.4.1 Protection of the TSF

5.4.1.1 FPT_STM.1 Reliable time stamps

Hierarchical to: No other components.

FPT_STM.1.1 The TSF shall be able to provide reliable time stamps for its own use.

Dependencies: No dependencies

Application notes: A possible way to maintain reliable time stamps for the TOE is to retrieve the time from the NTP server or underlying OS of the TOE. That is, the TOE may able to maintain reliable time stamp either by the help of NTP server provided for the IT environment or by the system time information provided by the OS.

5.4.1.2 FTP_ITC.1 Inter-TSF trusted channel

Hierarchical to: No other components.

FTP. ITC.1.1 The TSF is logically distinguished from other communication channels between the TSF and trusted IT remote products. The TSF shall also provide an assured identification of the unit and communication channel that protects the channel data from any modification or exposure.
FTP_ITC.1.2 The TSF shall allow initializing communication through the trusted channel.
FTP_ITC.1.3 The TSF shall initialize communication through the trusted channel regarding [remote management function].

Application notes: The TOE forms SSL protocol by invoking SSL function provided to IT environment, and therefore provides trusted channel.

6. TOE Summary Specification

This chapter provides a description of the security functions and assurance measures of the SNIPER. It shows that SNIPER meets the security functional requirements and assurance requirements for the network intrusion prevention system protection profile claimed.

6.1. Security Functions

This section describes the summary specification of TOE security functions (TSF) based on the TOE security functional requirements.

- Security Audit (WFAU)
- User Data Protection (WFDP)
- Identification and Authentication (WFIA)
- Security Management (WFMT)
- TSF Protection (WFPT)

The strength of function (SOF) targeted by the TOE is SOF-medium. Required SOF when the threat agent is assumed to possess a moderate attack potential is defined SOF-medium.

6.1.1. Security Audit (WFAU)

The security audit performs the following functions.

- Audit data generation (WFAU_GEN)
- Audit data search and retrieval (WFAU_SAR)

6.1.1.1 Audit data generation (WFAU_GEN)

(1) Security Audit events gathering (WFAU_GEN_EVENT)

If the following events occur, an identifier for the subject and entity, event types and results, date and time of the events are stored on DB. .

- SNIPER Start-up
- Responses performed against the urgent security violations
- Operation start/end of analysis mechanism, auto-response via the tool
- Alterations of Audit configuration during the operation
- Allowing the requested information flow
- Countermeasures taken against the authentication failure, Recovery to the normal status

- Failure in use of the authentication mechanism
- Use of Management function
- All failures detected by the TSF
- Denial of operation due to the limited resources
- Modification of the user group
- Alteration of time
- Contents of the integrity error, Contents and results of the countermesures toward the integrity error
- Session locking via session locking mechanism
- Session termination via session locking mechanism
- Failure of the secure channel, Identification between the host of the secure channel and the target

6.1.1.2 Audit data search and retrieval (WFAU_SAR)

(1) Audit review (WFAU_SAR_SAR)

If an administrator requires audit records, transmit audit records to the Client, make them viewable on the Client screen so that they may be sorted and searched by the event types, time, and results. Print them in report forms.

(2) Audit data (LOG) View (WFAU_SAR_LOG)

Convert the audit log generated at the gathered packet into a viewable format and view contents of the audit log stored at Log DB and that the administrator is viewing in realtime.

Make the security violation events audit data viewable on the Client screen so that they may be sorted and searched by the event types, time, and the results, and to accommodate administrator's analysis, provide a separate interface so that the data may be printed in the composition of picture and chart, graph, report forms.

6.1.1.3 SFR Mapping

TSF	SFR Mapping
Audit data generation (WFAU_GEN)	FAU_ARP.1 Security Alarms
	FAU_GEN.1 Audit data generation
	FAU_GEN.2 User identity association
	FAU_SAA.1 Potential violation analysis
Audit data search and retrieval (WFAU_SAR)	FAU_SAR.1 Audit review
	FAU_SAR.3 Selectable audit review
	FAU_SEL.1 Selective audit

[Table-14] SFR Mapping

6.1.2 User Data Protection (WFDP)

User Data Protection operates the following functions.

- Firewall Function (WFDP_FFU)
- Blackhole blocking (WFDP_BLK)
- QoS blocking (WFDP_QOS)
- Intrusion detection function (WFDP_DET)
- Intrusion analyzing function (WFDP_ALS)
- Intrusion countermeasure (WFDP_ACT)

6.1.2.1 Firewall Function (WFDP_FFU)

(1) Firewall function (WFDP_FFU_FFU)

SNIPER allows or denies the packet after comparing with the blocking policy.

SNIPER classifies into target and group, domain and registers and registers service to configure blocking and permitting policy.

Also each target configured at the firewall has security level of 1 to 10. 1 refers that the security level is high and 10 refers that the security level is low. According to the security level, a target with low security level cannot access to the target with high security level.

If the traffic from the unauthorized external IT entity corresponds to the accept rules of the system, TOE allows the relevant traffic or sessions.

Followings are the sessions allowed to pass the firewall.

- Sessions registered on the whitehole table
- Sessions registered on the CPList via stateflul inspection
- Sessions allowed to pass via the ACCEPT rules of the firewall

6.1.2.2 Blackhole blocking (WFDP_BLK)

(1) Blackhole blocking (WFDP_BLK_BLK)

Based on an each classified blocking method registered on the blackhole list, compare communication between the attacker and the protected system with the attacker IP, victim IP, protocol, or victim port whether it corresponds to each other. If it corresponds, block, otherwise permit.

Blocking history registers on the blackhole list is shown below.

- Session locking on a realtime monitoring: Session on a realtime monitoring is indicated as it classified into active and inactive session and the administrator may shut-down the connection. Sessions blocked at the realtime monitoring are registered on the Blackhole list, and there fore access denied for 60 seconds.
- Defense configuration of security violation events list:

According to the rule that was set to ‘defense’ at the security violation events list, targets are blocked for a certain period of limited time set by the administrator.

- History registered by the administrator on a Realtime blocking list:

May register IT entities that the administrator attempts to block at the realtime blocking list, and blocked for a certain period of limited time set by the administrator.

- Harmful information:

When designated to harmful information and set to ‘block’, it shall be blocked for a certain period of time set by the administrator.

- Restriction configuration of the internet use of the host management:

Block when the Internet use on a specific IT entity or network at the host management was set to restrict. Keep blocking until the administrator modifies to ‘Accept’.

6.1.2.3 Qos blocking (WFDP_QOS)

(1) QOS blocking (WFDP_QOS_QOS)

QoS, a function that ensures or restricts the bandwidth of traffic, may set blocking methods on incoming traffics from the interface configured by the administrator by the network, protocol, and service. When it exceeds the configuration value, traffic is blocked.

6.1.2.4 Intrusion detection function (WFDP_DET)

(1) Intrusion detection target events information gathering (WFDP_DET_EVENT)

When security violation events occur on the protected system, in order to detect and block, collect information on the intrusion detection target events of an event via the protected system and the activity on the network of the user who used the system in advance, and therefore store identifier and information on the subject and entity, event type, date and time of the event to DB.

(2) Contract audit DB selection/contraction/modification (WFDP_DET_CON)

Reads contents of the packet stored in the packet memory and analyzes at each stage of Data link layer, Network layer, Transport layer, and Application layer, then selects security associated information, and therefore generates contract audit through contraction and modification.

(3) Stored audit log DB (WFDP_DET_DBSTG)

Stores the audit log generated at the gathered packet to DB.

(4) Stored security violation events information (WFDP_DET_INFOSTG)

When security violation attempts to attack the protected system, it compares the gathered data on a stored security violation events list with audit events of the intrusion detection system, and provides Client

screen so as to inquire all intrusion detection results that are considered to be potential or attacking security violation.

Intrusion detection result is suitable for the authorized administrator to interpret information since it stores information of the attacker and victim server, type of attack, attack initiation time, attack termination time, security violation items, number of attempts, in addition to the information of the domain and attacker obtained from the external DNS server during the process of analyzing the packet. When it's an internal user, by storing detail information (such as Mac Address of the LAN card etc.) on DB, also make it suitable for the authorized administrator to interpret information.

6.1.2.5 Intrusion Analyzing Function (WFDP_ALS)

(1) Intrusion Analysis (WFDP_ALS_POLDET)

SNIPER is consisted as an In-line mode on the network and compares all packets that attempt to pass through the SNIPER with Blackhole list. Authorized packets during this process are again compared with pattern Block according to protocol, victim port, and packet data. If the corresponding rules were found on the Pattern Block list and they were set to 'Defense', SNIPER discards those packets and registers on the BlackHole to defend for a registered time.

Analyzes IP of the accessed Packets, then at IP, TCP, UDP are analyzed, and at TCP, analyzes TCP Services (telnet, ftp etc.) and then stores security violation items after comparing with contents of the security violation events list by each analyzing stage of Link, Network, Transport, Application Layer during the process of generating audit log.

Security violation events lists are shown below.

- Denial of Service Attack : An attack that prevents the victim server from providing a normal service by sending counterfeited or falsified packet. It lowers system performance by having it waste system resources (SPU, Memory etc.) and increase network traffic.
- Information gathering attack: An attack capable of probing information that includes server vulnerability, system vulnerability, network path, presence of firewall installation of the attack target, before the attacker attacks the specific server or system.
- Protocol vulnerability: An attack that exploits defects of the protocol regulation. It may create an overload on the network and system or prevent normal service by killing the server.
- Service attack: An attack that gains authority or operates commands through illegal access to a server. It accesses to a server using vulnerability of the various service and overflow bugs (occurs due to a software variable managing).
- Web CGI Attack: An attack that gains authority or operates commands illegally by exploiting CGI (supported by the Web) Bug.
- Backdoor Attack: An attack that installs program on the target system on a malicious purpose. Using installed program, it destroys system or gain information.

- User definition attack: Administrators may register at discretion.
- Service Statistic analysis: Detects abnormal behavior or computer resource use. Analyzes traffic transition of each service port on the network, and by using this, detects abnormal symptoms on the network.
- Protocol statistic analysis: Detects abnormal behavior or computer resource use. Analyzes traffic transition of each protocol on the network, and by using this, detects abnormal symptoms on the network.
- IP Statistic analysis: Detects abnormal behavior or computer resource use. Analyzes traffic transition on a usual network, and by using this, detects abnormal symptoms on the network.
- Pattern Block: 'Drop' harmful packets such as Worm virus or the One Way Attack detected at the Pattern Block, preventing harmful packets transmitting to the target system. Also by registering detected information and settings on the Black Hole list, blocks consecutive attacks effectively.

Allows sessions when they do not correspond to the Attack Accepted Count/Time configured in the security violation event lists.

6.1.2.6 Intrusion Countermeasure (WFDP_ACT)

(1) Administrator report (WFDP_ACT_ALARM)
Reads security violation items on the memory and sends content message of the detected violation items to the administrator making alarm ring according to the levels of security violation items. Dispatch E-mail in a form designated at the configuration by each security violation item.

(2) Response regarding system protection (WFDP_ACT_KILL)
Response regarding security violation items verifies whether to block or not at the SNIPER configuration. If it indicates 'defense', block the connection, if it indicates 'detection', do not block the connection. When it indicates to block, control the access for a certain period of time by registering attacker's IP and Port on the Blackhole List.

(3) Interoperation between ESM and the control server (WFDP_ACT_LINK)
In response to the security violation events, it verifies whether ESM interlocks to the control server or not, and then transmits security violation events information to the interlocked ESM and control server.
For the security of transmitting data, SNIPER supports interoperation by using the trusted network communication and the encryption protocol that is supported by the each security product.

6.1.2.2 SFR Mapping

TSF	SFR Mapping
Firewall function (WFDP_FFU)	FDP_IFC.1(1) Subset information flow control (1) FDP_IFF.1(1) Simple Security Attributes (1) FPT_RVM.1 Non-bypassability of the TSP
Blackhole blocking (WFDP_BLK)	FDP_IFC.1(2) Subset information flow control (2) FDP_IFF.1(2) Simple security attributes (2) FPT_RVM.1 Non-bypassability of the TSP FTA_SSL.3 TSF-initiated termination
Qos blocking (WFDP_QOS)	FDP_IFC.1(3) Subset information flow control (3) FDP_IFF.1(3) Simple security attributes (3)
Intrusion Detecting function (WFDP_DET)	FAU_GEN.1 Audit data generation FAU_SAR.1 Audit review FAU_SAR.3 Selective audit review FAU_SEL.1 Selective audit
Intrusion Analyzing function (WFDP_ALS)	FDP_IFC.1(4) Subset information flow control (4) FDP_IFF.1(4) Simple security attributes (4)
Intrusion countermeasure (WFDP_ACT)	FAU_ARP.1 Security report FDP_IFC.1(4) Subset information flow control (4) FDP_IFF.1(4) Simple security attributes (4)

[Table-15] SFR Mapping

6.1.3 Identification and Authentication (WFIA)

Identification and authentication operates the following functions.

• User Identification and Authentication (WFIA_ACCESS)

6.1.3.1 User Identification and Authentication (WFIA_ACCESS)

(1) User identification and authentication function (WFIA_ACCESS_LOGIN)

All users shall register an accessing IP address when registering the user ID so that if the administrator enters ID and Password at the designated IP Client screen, it is encrypted by SSL method and transmitted.
It prevents identification and authentication data from draining and being reused by encrypt communicating through SSL between SNIPER server and SNIPER user.
Transmitted encryption data reads/compares the identification and authentication information to DB at the SNIPER Server, and therefore identifies/authenticates the user.

Passwords shall be created with more than 6 or less than 10 letters including alphabets, numbers and special characters. It shall include at least 1 or more special characters. Also, passwords cannot be

identical to IDs, and once password is used, it shall be used at least 10 or more times to be reused. It shall configure 1 to 99 days of validation time of the administrator's password.
When an administrator enters his ID on a login screen, make it appear as "ID: *******" in order to protect password from draining.
Identification and authentication using disposable passwords generates different password every time it uses, and therefore prevents the access of unauthorized users.
When users attempt to log on, server issues the Challenge value that corresponds to n-1, and then the user enters the password that he remembers and sends the result obtained from applying hash function (SHA-1) for n-1 times to the server.

Server applies hash function 1 to the result transmitted by the user and if it corresponds to the stored value, authentication proceeds.

When authenticate, if the network administrator failed to Login within a certain count of the authentication attempts, count the number of attempts whether it exceeds the configured count. If it exceeds, print the error message and report to the user and administrator. User identification and authentication is strength of function (SOF) related security function. SOF-medium.

6.1.3.2 SFR Mapping

TSF	SFR Mapping
User identification and Authentication function (WFIA_ACCESS)	FAU_ARP.1 Security alarms FAU_SAA.1 Potential violation analysis FIA_AFL.1 Authentication failure handling FIA_UAU.1 Authentication FIA_UAU.4 Reuse prevention authentication mechanism FIA_UAU.7 Protected authentication feedback FIA_UID.2(1) User identification before any action (1) FIA_UID.2(2) User identification before any action (2) FTP_ITC.1 Inter-TSF trusted channel

[Table-16] User Identification and Authentication function SRF Mapping

6.1.4 Security Management (WFMT)

Security administrator is classified by Super administrator, Security administrator, and System administrator.
Each administrator's privilege and role is determined by the Super administrator. Security management operates the following functions.

- Management of audit function (WFMT_AUDIT)

• OS Configuration (WFMT_CONFIG)
• Management of security violation events list (WFMT_POLDET)
• Management of firewall policy (WFMT_POLFW)
• Management of interoperation between ESM and control server regarding the security violation events (WFMT_ESM)
• IP POOL Management (WFMT_IPPOOL)
• Update (WFMT_UPD)
• QoS Policy (WFMT_POLQOS)

6.1.4.1 Management of audit function (WFMT_AUDIT)

(1) Management of audit function (WFMT_AUDIT_MAN)

Provides interface for the authorized network administrator in order to set up IPS mode, IDS mode, Firewall mode, QoS so as to operate harmful traffic detection and blocking through audit.

Configure audit mode whether to operate an audit function over SNIPER activation and shutdown, audit start-up and shutdown, access history, access failure etc...

① Status Check (WFMT_AUDIT_MAN)

Check integrity of the data that are necessary for starting up the SNIPER operation and provide interface so as to check the integrity according to the administrator's request.

Indicates the system memory information and verifies SNIPER process that is currently running. When the process is abnormal, it reboots after storing audit records.

Check on the Client screen to examine whether the network driver of SNIPER IPS is activating normally. Provides state of packets transmitted from the each interface of NIC and that will be delivered.

② Management of the stored medium (WFMT_AUDIT_MAN)

SNIPER provides interface to an authorized network administrator in order to configure the usage of audit data stored medium of the protected system.

③ Backup and Repair (WFMT_AUDIT_MAN)

SNIPER backup data files generated by SNIPER, using HDD or other devices in order to cope with file damage, safekeeping of the stored data, insuring capacity of the stored medium. And then 'Restore' the previously 'Backup' data to inquire.

Using the DB backup schedule, auto backup according to the cycle configured by the administrator.

④ Time Synchronization (WFMT_AUDIT_MAN)

Time modification of the SNIPER is only possible through the authorized administrator.

Information recorded on the SNIPER is recorded based on the SNIPER server time. If the SNIPER server

time was not set correctly, information that SNIPER records cannot be trusted. Therefore, provides the time synchronization interface that configure the SNIPER Server time to GMT standard time.

6.1.4.2 OS Configuration (WFMT_CONFIG)

(1) OS Configuration (WFMT_CONFIG_OPERATION)

An authorized network administrator may define administrators that use SNIPER according to security roles. He may also operate registration, modification, and deletion of identification and authentication data. Register administrator ID, password, the term of validity, authority, call reference, E-Mail Address, Clients (PC) IP address, and reference information.

Count the number of access attempts by configuring the number of access attempt limit. If it exceeds, print the warning screen, terminate the session, and block access for 30 seconds.

① Host Management (WFMT_CONFIG_OPERATION)

SNIPER may register, modify, and delete information of the examining target host. SNIPER generates data, based on configured host information and uses the data for operating. Configures MAC address, IP address, host name, internet use, routing functions.

② Log management (WFMT_CONFIG_OPERATION)

SNIPER provides log management configuration, inquiry, and modification so as to leave administrators a detail history on a communication history between the user and the server regarding protocol and service that SNIPER handles.

③ Management of harmful information blocking (WFMT_CONFIG_OPERATION)

Harmful information blocking function is a function that blocks, modifies, and deletes harmful information. Harmful information blocking analyzes <Title></Title> Tag and URL at the audit log generation-TCP Session-Http session data.

Harmful information terms may be included in <Title></Title> Tag and harmful information site may be included in URL.

If set to ‘block’ by the administrator, SNIPER shutdowns the corresponding TCP session.

④ Network management (WFMT_CONFIG_OPERATION)

Configures internal IP, audit IP, audit exceptional IP. Inputs network IP Address, Net mask and therefore configure available address. Regarding the registered IP, SNIPER detects intrusion and handles IP related information.

Let the configured network verify whether to use DHCP, DNS, and therefore prevents intrusion detection errors due to IP SPOOFING.

If not configured separately, configure the IP bands of network installed with SNIPER as observing targets.

⑤ Management of security audit countermeasure (WFMT_CONFIG_OPERATION)

SNIPER provides the authorized administrator a function that sends stored medium check, login failure, integrity check, packet loss due to an excessive traffic, overload of CPU, NIC failure by mail.

⑥ Session locking function of the Security Function (WFMT_CONFIG_OPERATION)

An authorized network administrator may set time-out to enhance security of the account.

When the Client screen of SNIPER does not activate by the authorized administrator for a certain period of time, or when there are no inputs from the keyboard or mouse, SNIPER Client logs out automatically. Standard time is set to 30minutes.

⑦ Environment variable (WFMT_CONFIG_OPERATION)

Configures a screen for GUI. Configure Hide Login ID, SNIPER information title bar setting, risk level ICON setting, risk level string setting, OTP, Connection program setting, Display setting, Alarm setting.

6.1.4.3 Management of security violation events list (WFMT_POLDET)

(1) Management of security violation events list (WFMT_POLDET_MAN)

When SNIPER initiates the operation, it reads list files on the security violation events and manages in the memory. When modification on the security violation events list occurs, the content shall be maintained by storing at list file.

Security Violation Event Type	Action
Denial of Service	Change default value, Query, Modify
Information Gathering	Change default value, Query, Modify
Protocol Vulnerability	Change default value, Query, Modify
Service Attack	Change default value, Query, Modify
WebCGI	Change default value, Query, Modify, Delete, Create
Backdoor	Change default value, Query, Modify, Delete, Create
Userdefine	Query, Modify, Delete, Create
Protocol Statistic Analysis	Change default value, Query, Modify
Service Statistic Analysis	Change default value, Query, Modify, Delete, Create
IP Statistic Analysis	Change default value, Query, Modify
PATTERN BLOCK	Change default value, Query, Modify, Delete, Create

[Table-17] Security Violation Event Type

Provides configurations of detection and detection policy, defense configuration function on each security violation event.

Each security violation event includes following attributes: Type of attack, Attack accepted time/ Attack accepted count, Blocking time, Filter, Detection, Defense, Exceptional IP, and Risk level. According to type of attack, one may define whether an attack occurred or not based on the attack accepted

time/attack accepted count. Detects and defines aggression level of the abnormally overloading traffic and therefore blocks the detected IT entity for a blocking time.

6.1.4.4 Management of firewall policy (WFMT_POLFW)

(1) Management of firewall policy (WFMT_POLFW_MAN)
SNIPER shall configure whether to allow or block the policy, host needed for the policy setting, network, registration, modification and deletion of the group, and the registration, modification and deletion of service.
Entities configured at the firewall have security levels from 1 to 10. Security level of 1 represents high level of security while 10 represents the low level.

6.1.4.5 Management of interoperation between ESM and the control server regarding security violation events (WFMT_ESM)

(1) Interoperation setting between ESM and the control server (WFMT_ESM_LINK)
SNIPER provides the authorized network administrator a control center interface in order to send security violation events information to ESM and control server that operate to cope with the security violation events.

6.1.4.6 IP POOL Management (WFMT_IPPOOL)

(1) IP POOL Management (WFMT_IPPOOL_MAN)
SNIPER provides a function to manage the intrusion detection events and traffic information by each IP band group. Administrator may also add/modify/delete information of each IP band via the IP POOL management interface. Only the super administrator may modify information of the IP POOL management.

6.1.4.7 Update (WFMT_UPD)

(1) Update (WFMT_UPD_CON)
Authorized network administrators are provided with Live Update interfaces so as to renew the data. They may access to Update Server through the SNIPER Client receiving newly updated security violation events list and therefore, update on the SNIPER Server. By using scheduling function, authorized network administrator also provides the interface that enables SNIPER Server to access Update Server receiving newly updated security violation events list, and then updates on the SNIPER Server.

6.1.4.8 QoS Policy (WFMT_POLQOS_QOS)

(1) QOS Policy (WFMT_POLQOS_QOS)

SNIPER provides QoS policy setting interface that ensures or limits bandwidth of the traffic generated by a group of specific network.

6.1.4.9 SFR Mapping

TSF	SFR Mapping
Management of audit function (WFMT_AUDIT)	FAU_GEN.2 User Identity association FMT_MOF.1 Management of security functions behavior FMT_MTD.1(3) Management on TSF data (3) FMT_MTD.2(1) Management of limits on TSF data (1) FMT_SMF.1 Specification of management functions FPT_STM.1 Trusted Timestamp FRU_FLT.1 Degraded fault tolerance
OS Configuration (WFMT_CONFIG)	FAU_ARP.1 Security alarms FAU_SEL.1 Selective audit FAU_SAA.1 Potential violation analysis FAU_STG.3 Action in case of possible audit data loss FIA_AFL.1 Authentication failure handling FIA_ATD.1(1) User attribute definition (1) FIA_ATD.1(2) User attribute definition (2) FMT_MOF.1 Management of Security functions FMT_MSA.1 Management of Security attributes FMT_MTD.1(3) Management of TSF data (3) FMT_MTD.1(4) Management of TSF data (4) FMT_MTD.2(2) Management of limits on TSF data (2) FMT_SMF.1 Specification of management functions FMT_SMR.1 Security roles FPT_SEP.1 TSF domain separation FPT_FLS.1 Failure with preservation of secure state FPT_TST.1 TSF testing FRU_FLT.1 Degraded fault tolerance FTA_SSL.1 TSF-initiated session locking
Management of Security violation events list (WFMT_POLDET)	FMT_MOF.1 Management of Security functions FMT_MSA.1 Management of Security attributes FMT_MSA.3 Static attribute initialization FMT_SMF.1 Specification of management functions FRU_RSA.1 Maximum quotas FMT_MTD.1(2) Management of TSF data (2)
Management of firewall function (WFMT_POLFW)	FMT_MOF.1 Management of Security functions FMT_MSA.1 Management of Security attributes FMT_SMF.1 Specification of management functions FMT_MTD.1(1) Management of TSF data (1)
Management of the interoperation function between ESM and the control server regarding security violation events	FMT_MOF.1 Management of Security functions FMT_SMF.1 Specification of management functions

(WFMT_ESM)	
IP POOL Management (WFMT_IPPOOL)	FMT_MOF.1 Management of Security functions FMT_SMF.1 Specification of management functions
Update (WFMT_UPD)	FMT_MOF.1 Management of Security functions FMT_MTD.1(3) Management of TSF data (3) FMT_SMF.1 Specification of management functions
QoS Policy (WFMT_POLQOS)	FMT_MOF.1 Management of Security functions FMT_MSA.1 Management of Security attributes FMT_SMF.1 Specification of management functions FRU_RSA.1 Maximum quotas

[Table-18] Security Management SFR Mapping

6.1.5 TSF Protection (WFPT)

The TSF protection operates the following functions.

- TSF stored data integrity check (WFPT_INTSTDATA)
- TSF transmitting data integrity check (WFPT_INTTRDATA)
- Prevention of audit data loss (WFPT_CHKDB)
- Abstract machine testing (WFPT_ATM)
- IPS Status Check (WFPT_CHKSYS)

6.1.5.1 TSF stored data integrity check (WFPT_INTSTDATA)

(1) TSF stored data integrity check (WFPT_INTSTDATA_INT)

TSF stored data integrity check is verified by identity of HMAC-SHA-1 encryption method and authority of file, owner, group, modified date.

Check integrity of the data that are necessary for starting up the SNIPER operation. Also check the standard network configuration information and provide interface so as to check the integrity according to the administrator's request. There are 5 stored files that ensure the integrity.

- SNIPER execution file and Log storage execution file
- Security Violation Event List file
- Identification and Authentication file
- Configuration file
- User defined file

If integrity errors of the stored files were found, send warning mail and warning message to the administrator.

6.1.5.2 TSF transmitting data integrity check (WFPT_INTTRDATA)

(1) TSF transmitting data integrity check (WFPT_INTTRDATA_INT)

In order to assure the integrity and the confidentiality of the data transmitted from SNIPER server and Client communication, use SSL protocol.

Encrypt and transmit using SSL encryption method at the sending point where the data is being transmitted, decode using SSL encryption method at the receiving point, and therefore ensures integrity.

If integrity errors were found during the decoding process, drop transmitted data so as to not affect the security function, and prevent contents of the transmitting data from draining by using SSL inscription method.

HMAC-SHA-1 (Integrity algorithm) of the TSF transmitting data integrity check satisfies SOF-medium, since the possibility of the low-leveled attacker creating the identical hash seems very low. The strength of the authentication mechanism is determined by the possiblility and permutation mechanism.

6.1.5.3 Prevention of audit data loss (WFPT_CHKDB)

(1) Prevention of audit data loss (WFPT_CHKDB_PRE)

When reaches a critical value of the stored medium, it deletes the oldest Traffic Dump data, detail information on each service, in order to insure the capacity of stored medium. Also if the capacity is less than 100MB, it modifies firewall policy to DROP.

Check every 5 minute whether the usage for the audit data stored medium of the system under protection exceeds 90 % or 100MB of the usage limit set by an authorized administrator. If it exceeds 90% of the usage limit, warn administrator by sending messages or e-mails.

6.1.5.4 Abstract machine testing (WFPT_ATM)

(1) Abstract machine testing (WFPT_ATM_ATM)

SNIPER, when running, operates Integrity of executable files of process, Integrity of administrator's information file, Verification of the stored medium, Confirmation of license.

Periodically or when requested, the Abstract machine testing verifies normalcy of the process and NIC status. It reboots when the state of the process is abnormal.

6.1.5.5 IPS Status Check (WFPT_CHKSYS)

(1) IPS Status Check (WFPT_CHKSYS_INFO)

When the Master system (Active) is caused with any hardware problems, SNIPER automatically transmits the traffic to the Slave system. Authorized administrators may synchronize the status check table via the IPS user interface and may also check on the status of NIC port and line.

6.1.5.6 SFR Mapping

TSF	SFR Mapping
Integrity Assurance of the stored data (WFPT_INTSTDATA)	FAU_STG.1 Protected audit trail storage FMT_MTD.1(3) Management of TSF data (3) FPT_TST.1 TSF testing
Integrity Assurance of the Transmitting data (WFPT_INTTRDATA)	FPT_TST.1 TSF testing FTP_ITC.1 Inter-TSF Trusted Channel
Prevention of audit data loss (WFPT_CHKDB)	FAU_STG.3 Action in case of possible audit data loss FAU_STG.4 Prevention of audit data loss
Abstract machine testing (WFPT_ATM)	FPT_AMT.1 Abstract machine testing
IPS Status Check (WFPT_CHKSYS)	FMT_MOF.1 Management of security function FPT_FLS.1 Failure with preservation of secure state FRU_FLT.1 Degraded fault tolerance

[Table-19] TSF Protection SFR Mapping

6.2. Assurance Measures

This section describes the TOE assurance measures. The assurance measures are used to satisfy the assurance requirements, which are listed in the [Table-20].

Assurance class	Assurance component		Assurance measures
Configuration management	ACM_AUT.1	Partial CM automation	IPS60e_ Configuration Management Document
	ACM_CAP.4	Generation support and acceptance procedures	
	ACM_SCP.2	Problem tracking CM coverage	
Delivery and operation	ADO_DEL.2	Detection of modification	IPS60e_ Delivery Document
	ADO_IGS.1	Installation, generation, and start-up procedures	IPS60e_ Installation Manual
Development	ADV_FSP.2	Fully defined external interfaces	IPS60e_ Functional specification
	ADV_HLD.2	Security enforcing high-level design	IPS60e_ High-level Design
	ADV_IMP.1	Subset of the implementation of the TSF	IPS60e_ Validation Specification
	ADV_LLD.1	Descriptive low-level design	IPS60e_ Low-level Design
	ADV_RCR.1	Informal correspondence demonstration	IPS60e_ Functional specification IPS60e_ High-level Design IPS60e_ Validation Specification IPS60e_ Low-level Design IPS60e_ Tests
	ADV_SPM.1	Informal TOE security policy model	IPS60e_ Security Policy Modeling
Guidance documents	AGD_ADM.1	Administrator guidance	IPS60e_ Administrator Guidance
	AGD_USR.1	User guidance	
Life cycle support	ALC_DVS.1	Identification of security measures	IPS60e_ Life Cycle Support
	ALC_LCD.1	Developer defined life-cycle model	
	ALC_TAT.1	Well-defined development tools	
Tests	ATE_COV.2	Analysis of coverage	IPS60e_ Testing _
	ATE_DPT.1	Testing: high-level design	
	ATE_FUN.1	Functional testing	
	ATE_IND.2	Independent testing – sample	
Vulnerability	AVA_MSU.2	Validation of analysis	IPS60e_ Misuse Analysis

assessment	AVA_SOF.1	Strength of TOE security function evaluation	IPS60e_ Vulnerability Analysis
	AVA_VLA.2	Independent vulnerability analysis	

[Table-20] Assurance measures

6.2.1 Configuration Management

- ACM_AUT.1 (Subset CM automation):

Assures by Configuration Management system automated by the subset CM automation for the TOE.

- ACM_CAP.4 (Generation support and Acceptance procedures):

The TOE is managed by Configuration Management system. Assured by CM document regarding CM procedures of the TOE and the CM system.

- ACM_SCP.2 (Problem tracking CM coverage):

Assures configuration items list of the TOE by configuration management document (configuration management log).

6.2.2 Delivery and Operation

- ADO_DEL.2 (Detection of modification):

Assures to provide delivery document on delivering the TOE or part of it.

- ADO_IGS.1 (Installation, Generation, Start-up procedures):

Assures by an installation quide regarding installations, generation, and start-up procedures.

6.2.3 Development

- ADV_FSP.2 (Fully defined external interfaces):

Function specification of the TOE is assured by the function specification document.

- ADV_HLD.2 (Security enforcing high-level design):

High-level design of the TOE is assured by the high-level design document.

- ADV_IMP.2 (Subset of the implementation of the TSF):

Implementation of the TOE security function is assured by the validation specification.

- ADV_LLD.1 (Descriptive low-level design):

Low-level design for the TOE security function is assured by the low-level design document.

- ADV_RCR.1 (Informal correspondence demonstration):

Correspondence between the TSF demonstrations is assured via function specification, high-level design, validation specification, low-level design, and tests.

- ADV_SPM.1 (Informal TOE security policy model):

Assures by the security policy model regarding the TSP model.

6.2.4 Guidance

- AGD_ADM.1 (Administrator guidance):

Administrator guidance for those who manage systems is assured by administrator guidance.

- AGD_USR.1 (User guidance):

Users that are capable of using TOE are trusted administrators and assured by administrator guidance.

6.2.5 Life Cycle Support

- ALC_DVS.1 (Security measure):

A security document, related to the TOE development, is assured by life-cycle support.

- ALC_LCD.1 (Developer defined life-cycle model):

Assures life-cycle model used for the TOE development and maintenance by life-cycle support.

- ALC_TAT.1 (Well-defined development tool):

A development tool used for the TOE development. Assured by the life cycle support.

6.2.6 Tests

- ATE_COV.2 (Analysis of coverage):

An analysis document regarding the coverage. Assured by the test paper.

- ATE_DPT.1 (Testing: high-level design):

An analysis document of a high-level design standard of the test. Assured by the test paper.

- ATE_FUN.1 (Functional testing):

A testing document of the TSF result. Assured by the test paper.

- ATE_IND.2 (Independent testing: sample):

Provides SNIPER IPS V5.0 for the TOE testing.

6.2.7 Vulnerability assessment

- AVA_MSU.2 (Validation of analysis):

Assures analysis of the guidance documents by the misuse analysis.

- AVA_SOF.1 (Strength of TOE security function evaluation):

An analysis document regarding the strength of TOE security function. Assured by the vulnerability analysis.

- AVA_VLA.2 (Independent vulnerability analysis):

A document that analyzes the vulnerability so as to not be exploited at the intended environment of the TOE. Assured by the vulnerability analysis document.

7. Protection Profile Claims

This chapter explains claimed protection profile and identifies objectives and requirements that are not included in the PP.

7.1 Protection Profile Reference

The TOE satisfies all requirements as by referring to the following PP.

Registration number: PP-009
Title: Network Intrusion Prevention System PP.
Version: V1.1, Dec. 21st, 2005
Evaluation Assurance Level: EAL4
Evaluation Standard: Information Protection System Common Criteria V2.3

7.2 Protection Profile tailoring

The following table shows the security functional requirements that are tailored in this ST.

Functional Component	Name	remark
FAU_ARP.1	Security Alarms	
FAU_GEN.1	Audit data generation	
FAU_GEN.2	User Identification association	
FAU_SAA.1	Potential violation analysis	
FAU_SAR.3	Selectable audit	
FAU_SEL.1	Selective audit	
FAU_STG.1	Protected audit trail storage	
FAU_STG.3	Action in case of possible audit data loss	
FAU_STG.4	Prevention of audit data loss	
FDP_IFC.1(1)	Subset information flow control(1)	Component Iteration (PPadded)
FDP_IFC.1(2)	Subset information flow control(2)	Component Iteration (PPadded)
FDP_IFC.1(3)	Subset information flow control(3)	Component Iteration (PPadded)
FDP_IFC.1(4)	Subset information flow control(4)	Component Iteration (PPadded)
FDP_IFF.1(1)	Simple security attributes(1)	Component Iteration (PPadded)
FDP_IFF.1(2)	Simple security attributes(2)	Component Iteration (PPadded)

FDP_IFF.1(3)	Simple security attributes(3)	Component Iteration (PPadded)
FDP_IFF.1(4)	Simple security attributes(4)	Component Iteration (PPadded)
FIA_AFL.1	Authentication failure handling	
FIA_ATD.1(1)	User attribute Definition (1)	
FIA_ATD.1(2)	User attribute Definition (2)	
FIA_UAU.1	Authentication	
FIA_UAU.4	Reuse prevention authentication mechanism	
FIA_UAU.7	Protected Authentication feedback	
FMT_MOF.1	Management of security functions behavior	
FMT_MSA.1	Security attributes management	
FMT_MSA.3	Static attribute initialization	
FMT_MTD.1(1)	Management of TSF data (1)	Component Iteration (PPadded)
FMT_MTD.1(2)	Management of TSF data (2)	Component Iteration (PPadded)
FMT_MTD.1(3)	Management of TSF data (3)	Component Iteration (PPadded)
FMT_MTD.1(4)	Management of TSF data (4)	Component Iteration (PPadded)
FMT_MTD.2(1)	Management of limits on TSF data (1)	Component Iteration (PPadded)
FMT_MTD.2(2)	Management of limits on TSF data (2)	Component Iteration (PPadded)
FMT_SMF.1	Specification of management functions	Component Iteration (PPadded)
FMT_SMR.1	Security roles	
FMT_ATM.1	Abstract machine testing	
FMT_FLS.1	Failure with preservation of secure state	
FMT_TST.1	TSF testing	
FRU_FLT.1	Degraded fault tolerance	
FMT_RSA.1	Maximum quotas	
FTA_SSL.1	TSF-initiated session locking	
FTA_SSL.3	TSF-initiated termination	
FTP_ITC.1	Inter-TSF trusted channel	

[Table-21] Protection Profile Tailoring

7.3 Protection Profile Additions

This section describes claimed protection profile (Network Intrusion Prevention System Protection Profile V1.1, Dec. 21, 2005, KISA) and added/modified items.

Category	Item	Reference	Remark

Assumption	A.Secure TOE external server	Added to ST	Assumption
	A.TIME	Added to ST	
	A.TOE SSL Certificate	Added to ST	
Security policy	P.SSL Certificate management	Added to ST	Organizational security policy
Security objectives	OE.Secure TOE external server	Added to ST	TOE security objectives
	OE.TIME	Added to ST	
	OE.SSL Protocol	Added to ST	
Security functional Requirements	FIA_UAU.4 Reuse prevention authentication mechanism	Added to ST	Identification and Authentication

[Table-22] Additional security components

8. Rationale

This chapter describes the security objectives defined on the basis of the security environments (threats, assumptions, and organizational security policies) and the rationale for the security requirements that satisfy the security objectives. The rationale shows that the TOE provides efficient IT security measures in its security environments.

8.1 Security Objectives Rationale

The rationale for security objectives shows that the specified security objectives are suitable, not too much but sufficient enough to deal with security problems, and requisite. The security objectives rationale shows the following statements:

- Each assumption, threat, organizational security policy will be addressed by at least one security objective.
- Each security objective will address at least one assumption, threat, and organizational security policy.

The following table indicates the correlation of security environment and security objectives.

Security Objectives / Security Environment	O. AVAILABILITY	O. AUDIT	O. ADMINISTRATION	O. TSF DATA PROTECTION	O. ABNORMAL PACKET SCREENING	O. DOS ATTACK BLOCKING	O. IDENTIFICATION	O. AUTHENTICATION	O. INFORMATION FLOW CONTROL	OE. PHYSICAL SECURITY	OE. SECURITY MAINTENANCE	OE. TRUSTED ADMINISTRATOR	OE. SECURE ADMINISTRATOR	OE. HARDENDED OS	OE. SINGLE CONNECTION POINT	OE. VULNERABILITY UPDATE LIST	OE. SECURE TOE EXTERNAL SERVER	OETIME	OE. SSL PROTOCOL
A.Physical Security										●			●						
A.Security Maintenance											●								
A.Trusted Administrator												●							
A.Hardened OS														●					
A.Single Connection point															●				
A.Secure TOE																	●		

External server																			
A.TIME																		●	
A,TOE SSL Certificate																			●
T.Masquerade		●					●	●											
T.Failure	●			●									●	●					
T.Audit Failure	●	●																	
T.Inbound illegal information			●						●										
T.Unauthorized service access									●										
T.Anomaly packet transfer		●			●		●												
T.New Vulnerability Attack			●								●		●	●		●			
T.DoS Attack		●			●	●													
T.Replay Attack		●				●	●	●											
T.Bypassing	●								●	●					●				
T.Spoofing IP address		●			●	●	●												
T.Unauthorized TSF Data Modification	●	●		●			●												
TE.Poor Administration			●									●	●						
TE.Distribution and Installation												●	●						
P.Audit	●	●				●	●												
P.Secure Administration		●										●	●						
P.SSLCertificate management			●																●

[Table-23] Security Objectives Rationale

8.1.1 Rationale for the security objectives for the TOE

1) O. Availability

This TOE security objective ensures the TOE availability for providing minimum network service when the TOE is in failure or overloaded from attacks.

Therefore, this security objective is to guarantee the TOE availability to countermeasure the threats of

T.Failure, T.Unauthorized TSF data modification, T.Bypassing, and T.Audit failure, which means audit trail storage exhaustion attack.

2) O. Audit

This TOE security objective is to record the audit events for each user according to TOE audit record policy when a user uses security functions. The TOE guarantees to provide the means to keep the logged audit events safe and review them. That is, the TOE takes actions when the audit trail storage is full. The generation of audit record ensures that the identification of an attacker should be detected through the audit record in case continuous authentication attempts occur. Spoofing attacks, DoS attacks, and attacks of generating and sending abnormal packets can be traced through the audit record. Therefore, this security objective is to counter the threats like T.Masquerade, T.Audit failure, T.Anomaly Packet Transfer, T.DoS attack, T.Replay attack, T.Spoofing IP address, and T.Unauthorized TSF data modification, and is to support the organizational security policy of P.Audit.

3) O. Administration

The TOE controls the illegal access to internal network by establishing information flow control rules to enforce security policy. To do that, the TOE should provide the means to manage the TOE and TSF data safely for the generation and management of TOE configuration data, and the management of the latest vulnerability signature etc.

Therefore, this TOE security objective counters the threats like T.Inbound Illegal Information, T.Unauthorized service access, T.New vulnerability attack, and TE.Poor administration. It also supports the organizational security policy of P.Secure administration by providing the means for the authorized administrator to manage the TOE securely.

4) O. TSF data protection

When TSF data is modified without administrator's notice due to unexpected external attacks or TOE malfunctions, it may not be able to perform proper security policy. To prevent this event from occurring, the TOE ensures the proper operation of TSF by monitoring the TSF data for intentional or unintentional data changes and checking the integrity of TSF data. Therefore, this TOE security objective counters the threats like T.Failure and T.Unauthorized TSF data modification.

5) O. Abnormal packet screening

This security objective ensures that of a large amount of packets coming from the external to the internal network, the packets which are not suitable for the TCP/IP standard, the packets with an internal network address, broadcasting packets and looping packets will not be allowed to come in. Therefore, this TOE security objective is intended to counter the threats such as T.Anomaly packet transfer and T.Spoofing IP address.

6) O. DoS attack blocking

The attacker can make network DoS attacks on Intranet computers through the

TOE. A typical network DoS attack is to exhaust the computer resources by sending too many service requests from a remote attacker. Then the Intranet computer, under the attacks, would prevent legitimate users from using the computer by allocating much of resource for the DoS attacker. To

counter this attack, the TOE prevents a specific user from monopolizing the resources of a specific computer so that other legitimate users can use the resources without traffic. Therefore, this security objective is intended to counter the threats like T.DoS attack and T.Spoofing IP address.

7) O. Identification

The TOE users are either logged-on administrators who manage the TOE with the TOE authentication or external users (IT entities) who just use Intranet computer without the TOE authentication. All the cases of two need the identification function to deal with security events. The identification of administrators is necessary to grant the full responsibility to them and the identification of external entities is necessary to generate the audit record for abnormal packet transmission, prevention of DoS attacks and address disguise attacks and connection trials by external entities. Therefore, this security objective counters the threats like T.Masquerade, T.DoS attack, T.Spoofing IP address, T.Anomaly packet transfer, T.Replay attack, and T.Unauthorized TSF data modification. It also assists P.Audit.

8) O. Authentication

The user who wants to access the TOE should acquire the authentication. The authentication required in the TOE access may be vulnerable to the replay attack made by external entities. The TOE should provide the authentication mechanism, which can endure the replay attack according to the level of external entities. Therefore, this TOE security objective counters the threats like T.Masquerade and T.Replay attack.

9) O. Information flow control

The TOE is installed at the connection point between internal and external networks in order to control the information flow according to the security policy. According to allow/deny policy, this security objective ensure identifying and blocking various attacks on the network which mean virus attacks, e-mail or web services including illegal information and access to the unauthorized service. The TOE ensures the security of internal network by controlling the attacks based on the pre-defined rules and blocking the illegal access to the internal network. Therefore, this TOE security objective counters the threats like T.Inbound illegal information, T.Unauthorized service access and T.Bypassing.

8.1.2 Rational for the security objectives for the environment

1) OE. Physical security

The security objective for this environment is to ensure that the TOE is installed and operated at a physically secured place so that the TOE is protected from external physical attacks and TOE modification attempts. Therefore, the security objective for this environment is necessary to assist the assumption of A.Physical security and to counter the threat of T.Bypassing.

2) OE. Security maintenance

The security objective for this environment is to maintain the same level of security as the previous one by adopting changed environments and security policy to the TOE operation policy when the internal network environments is changed by configuration changes in internal network, the increase or

decrease in host (or in service) and so on. Therefore, the security objective for this environment is necessary to assist the assumption of A.Security maintenance and to counter the threat of T.New vulnerability attack.

3) OE. Trusted administrator

The security objective for this environment is to ensure the trustworthiness of an authorized administrator of the TOE. Therefore, the security objective for this environment is necessary to assist the assumptions of A.Trusted administrator and the security policy of P.Secure administration, and to counter the threats of TE.Poor administration and TE.Distribution and installation.

4) OE. Secure administration

The security objective for this environment is to ensure that the TOE is distributed and installed in a secure way and is configured, managed, and used securely by the authorized administrator. Therefore, the security objective for this environment is necessary to assist the assumption of A.Physical security and the security policy of P.Secure administration, and to counter the threats of T.Failure, T.New vulnerability attack, TE.Poor administration, and TE.Distribution and installation.

5) OE. Hardened OS

The security objective for this environment is to eliminate unnecessary OS services or measures and to harden the weak points in the OS so that the operation system is secure and reliable. Therefore, the security objective for this environment is necessary to assist the assumption of A.Hardened OS, and to counter the threats of T.Failure and T.New vulnerability attack.

6) OE. Single connection Point

The security objective for this environment is to ensure that all communications between internal and external networks are made through the TOE. Therefore, the security objective for this environment is necessary to assist the assumption of A.Single connection point, and to counter the threat of T.Bypassing.

7) OE. Vulnerability list update

The security objective for this environment is to protect the TOE and the internal network protected by the TOE from external attacks that are exploiting new vulnerability in them by renewing and managing the vulnerability database managed by the TOE. Therefore, the security objective for this environment is necessary to counter the threat of T.New vulnerability attack.

8) OE. Secure TOE external server

The security objective for this environment is to ensure that the external server interacting with the TOE is secure. Therefore, the security objective for this environment is necessary to assist the assumption of A.Secure TOE external server.

9) OE.TIME

The security objective for this environment is to provide the trusted NTP server and OS to maintain the reliable Timestamp for the TOE security function. Therefore, the security objective for this environment is necessary to assist the assumption A.TIME.

10) OE.SSL Protocol

The security objective for this environment is to ensure that the TOE builds up trusted channel by supporting trusted IT entity authentication and encryption communication function. Therefore, the security objective for this environment is necessary to assist assumptions of A.TOE SSL Certificate, P.SSL Certificate administration.

8.2 Security Requirements Rationale

This rationale demonstrates that the IT security functional requirements are suitable to meet the security objectives and hence address the security problems.

Security Objectives / SFR	O. AVAILABILITY	O. AUDIT	O. ADMINISTRATOON	O. TSF DATA PROTECTION	O. ABNORMAL PACKET SCREENING	O. DoS ATTACK BLOCKING	O. IDENTIFICATION	O. AUTHENTICATION	O. INFORMATION FLOW CONTROL
FAU_ARP.1 Security alarms		●							
FAU_GEN.1 Audit Data generation		●							
FAU_GEN.2 User identity association		●							
FAU_SAA.1 Potential violation analysis		●							
FAU_SAR.1 Audit review		●							
FAU_SAR.3 Selectable Audit review		●							
FAU_SEL.1 Selective audit		●							
FAU_STG.1 Protected audit trail storage		●							
FAU_STG.3 Action in case of possible audit data loss		●							
FAU_STG.4 Prevention of audit data loss		●							
FDP_IFC.1(1) Subset information flow control (1)									●
FDP_IFC.1(2) Subset information flow control (2)									●
FDP_IFC.1(3) Subset information flow control (3)									●
FDP_IFC.1(4) Subset information flow control (4)									●
FDP_IFF.1(1) Simple security attributes (1)					●				●
FDP_IFF.1(2) Simple security attributes (2)					●				●
FDP_IFF.1(3) Simple security attributes (3)					●				●
FDP_IFF.1(4) Simple security attributes (4)					●				●
FIA_AFL.1 Authentication failure handling							●	●	
FIA_ATD.1(1) User attribute definition (1)		●			●	●	●		●

FIA_ATD.1(2) User attribute definition (2)		●					●		
FIA_UAU.1 Authentication			●	●				●	
FIA_UAU.4 Reuse prevention authentication mechanism							●	●	
FIA_UAU.7 Protected authentication Feedback								●	
FIA_UID.2(1) User identification before any action (1)		●			●	●	●		●
FIA_UID.2(2) User identification before any action (2)		●	●	●			●		
FMT_MOF.1 Management of security functions behavior	●		●						
FMT_MSA.1 Management of security attributes			●	●					●
FMT_MSA.3 Static attribute initialization			●	●					●
FMT_MTD.1(1) Management of TSF data (1)			●	●					
FMT_MTD.1(2) Management of TSF data (2)			●	●					
FMT_MTD.1(3) Management of TSF data (3)			●	●					
FMT_MTD.1(4) Management of TSF data (4)			●	●					
FMT_MTD.2(1) TSF Management of limits on TSF data (1)	●		●						
FMT_MTD.2(2) TSF Management of limits on TSF data (2)	●		●						
FMT_SMF.1 Specification of Management Functions			●						
FMT_SMR.1 Security roles			●				●	●	
FPT_AMT.1 Abstract machine testing	●			●					
FPT_FLS.1 Failure with preservation of secure state	●								●
FPT_RVM.1 Non-bypassability of the TSP									●
FPT_SEP.1 TSF domain separation				●					●
FPT_STM.1 Reliable time stamps		●							
FPT_TST.1 TSF testing	●			●					
FRU_FLT.1 Degraded fault tolerance	●								●
FRU_RSA.1 Maximum quotas						●			
FTA_SSL.1 TSF-initiated session locking				●					
FTA_SSL.3 TSF-initiated termination						●			
FTP_ITC.1 Inter-TSF trusted channel			●	●					

[Table-24] Correlation of security objectives and security functional requirements

8.2.1 TOE Security Functional Requirements Rationale

This rationale demonstrates the following:

• Each TOE security objective is addressed by at least one TOE security functional requirement.

• Each TOE security functional requirement addresses at least one TOE security objective.

SFR	Rationale
FAU_ARP.1 Security alarms	As this component ensures the ability to take reactions in case a potential security violation is detected, it meets TOE security objective: O.Audit.
FAU_GEN.1 Audit data generation	As this component ensures that the TOE defines auditable events and generates the audit records, it meets TOE security objective: O. Audit.
FAU_GEN.2 User identity association	As this component requires user identification to define auditable events and to trace the association of audit records with users, it meets TOE security objective: O. Audit.
FAU_SAA.1 Potential violation analysis	As this component ensures the ability to monitor the audited events to indicate a potential violation of the TSP, it meets TOE security objective: O. Audit.
FAU_SAR.1 Audit review	As this component ensures the capability for authorized administrators to review information from the audit records, it meets TOE security objective: O. Audit.
FAU_SAR.3 Selectable audit review	As this component ensures the ability to perform searches of audit data based on criteria with logical relations, it meets TOE security objective: O. Audit.
FAU_SEL.1 Selective audit	As this component ensures the ability to include or exclude auditable events from the set of audited events based on attributes, it meets security objective: O. Audit.
FAU_STG.1 Protected audit trail storage	As this component ensures that TSF provides the ability to protect audit record from unauthorized modification and/or deletion, it meets security objective: O. Audit.
FAU_STG.3 Action in case of possible audit data loss	As this component ensures that actions are taken if a threshold on the audit trail is exceeded, it meets TOE security objective: O. Audit.
FAU_STG.4 Prevention of audit data loss	As this component ensures that actions are taken in case the audit trail is full, it meets TOE security objective: O. Audit.
FDP_IFC.1(1) Subset information flow control (1)	As this component ensures that the intrusion prevention security policy for TOE information flow control and its scope are defined, it meets TOE security objective: O.Information flow control.
FDP_IFC.1(2) Subset information flow control	As this component ensures that the intrusion prevention security policy for TOE information flow control and its scope are defined, it meets TOE

(2)	security objective: O.Information flow control.
FDP_IFC.1(3) Subset information flow control (3)	As this component ensures that the intrusion prevention security policy for TOE information flow control and its scope are defined, it meets TOE security objective: O.Information flow control.
FDP_IFC.1(4) Subset information flow control (4)	As this component ensures that the intrusion prevention security policy for TOE information flow control and its scope are defined, it meets TOE security objective: O.Information flow control.
FDP_IFF.1(1) Simple security attributes (1)	As this component describes the countermeasures for explicit attacks, it meets TOE security objective: O.Abnormal packet screening, O.Information flow control.
FDP_IFF.1(2) Simple security attributes (2)	As this component describes the countermeasures for explicit attacks, it meets TOE security objective: O.Abnormal packet screening, O.Information flow control.
FDP_IFF.1(3) Simple security attributes (3)	As this component describes the countermeasures for explicit attacks, it meets TOE security objective: O.Abnormal packet screening, O.Information flow control.
FDP_IFF.1(4) Simple security attributes (4)	As this component describes the countermeasures for explicit attacks, it meets TOE security objective: O.Abnormal packet screening, O.Information flow control.
FIA_AFL.1 Authentication failure handling	As this component defines the number of unsuccessful administrator authentication attempts and ensures ability to take actions when the defined number has been met or surpassed, it meets TOE security objective: O.Identification and O.Authentication.
FIA_ATD.1(1) User attribute definition (1)	This component requires maintaining IP address as security attribute for external IT entity. As IP address identifies external IT entities and creates audit history serving as the criteria for illegal addresses, DoS attacks, and information flow control, this component meets TOE security objectives: O. Audit, O.Abnormal packet screening, O.DoS attack blocking, O.Identification, and O.Information flow control.
FIA_ATD.1(2) User attribute definition (2)	As this component requires identifying an administrator, it meets TOE security objective: O.Audit and O.Identification.
FIA_UAU.1 Authentication	As this component ensures the ability to authenticate administrators successfully, it meets TOE security objectives: O.Administration, O.TSF Data protection, (Addition: This is because the TOE management and TSF Data protection function is possible only when administrator is authenticated.) and O.Authentication.

FIA_UAU.7 Protected authentication feedback	As this component ensures that only limited authentication feedback is provided to the administrator while the authentication is in progress, it meets TOE security objective: O. Authentication.
FIA_UID.2(1) User identification before any action (1)	As this component requires that the identifier for external IT entity be identified as a computer IP address, which identifies external IT entities and creates audit history serving as the criteria for illegal addresses, DoS attacks, and information flow control, it meets TOE security objectives: O. Audit, O.Abnormal packet screening, O.DoS attack blocking, O.Identification, and O.Information flow control.
FIA_UID.2(2) User identification before any action (2)	As this component requires identification of the administrator, it meets TOE security objectives: O.Audit, O.Administration, O.TSF data protection, and O.Identification.
FMT_MOF.1 Management of security functions behavior	As this component provides the authorized administrator with the ability to manage the security functions and ensures the availability when TOE failures occur, it meets TOE security objectives: O.Availability and O.Administration.
FMT_MSA.1 Management of security attributes	As this component ensures that only authorized administrators are allowed to access TSF data or security attribute data, which is necessary for the performance of TOE security functions, it meets TOE security objectives: O.Administration, O.TSF data protection, O.Information flow control.
FMT_MSA.3 Static attribute initialization	As this component ensures that only authorized administrators are allowed to access at the initialization of TSF data, or security attribute data, which is necessary for the performance of TOE security functions, it meets TOE security objectives: O.Administration, O.TSF data protection, O.Information flow control.
FMT_MTD.1(1) Management of TSF data (1)	As this component requires that only the authorized administrator should be able to manage the TSF data, it meets TOE security objectives: O.Administration and O.TSF data protection.
FMT_MTD.1(2) Management of TSF data (2)	As this component requires that only the authorized administrator should be able to manage the TSF data, it meets TOE security objectives: O.Administration and O.TSF data protection.
FMT_MTD.1(3) Management of TSF data (3)	As this component requires that only the authorized administrator should be able to manage the TSF data, it meets TOE security objectives: O.Administration and O.TSF data protection.
FMT_MTD.1(4) Management of TSF	As this component requires that only the authorized administrator should be able to manage the TSF data, it meets TOE security objectives:

data (4)	O.Administration and O.TSF data protection.
FMT_MTD.2(1)TSF Management of limits on TSF data (1)	As this component allows the authorized administrator to manage the limits of TSF data, and take countermeasures if the TSF data are at, or exceed the pre-defined limits, it meets TOE security objectives: O.Availability and O.Administration.
FMT_MTD.2(2)TSF Management of limits on TSF data (2)	As this component allows the authorized administrator to manage the limits of TSF data, and take countermeasures if the TSF data are at, or exceed the pre-defined limits, it meets TOE security objectives: O.Availability and O.Administration.
FMT_SMF.1 Specification of Management Functions	As this component requires specification of management functions such as security attributes, TSF data and security functions to be provided by the TSF, it meets TOE security objective: O.Administration.
FMT_SMR.1 Security roles	As this component restricts the role of the TOE security administrator to authorized administrator roles, it meets TOE security objectives: O.Administration, O.Identification and O.Authentication.
FPT_AMT.1 Abstract machine testing	As this component run a suite of tests to demonstrate the correct operation of the security assumptions provided by the abstract machine that underlies the TSF, it meets TOE security objectives:, O. Availability, O.TSF data protection.
FPT_FLS.1 Failure with preservation of secure state	As this component ensures that the TOE, in failure, preserves a secure state and performs the function of information flow control for the operation of core security functions, it meets TOE security objectives: O.Availability, O.Information flow control.
FPT_RVM.1 TSP Non-bypassability of the TSP	As this component ensures that the TSP enforcement functions are invoked and succeeded and prevents bypassing of information flow control, it meets TOE security objective: O. Information flow control.
FPT_SEP.1 TSF domain separation	As this component ensures that the TSF maintains a security domain for its own execution that protects it from interference and tampering by untrusted subjects, it meets TOE security objective: O.TSF data protection O. Information flow control.
FPT_STM.1 Reliable time stamps	This component requires that the TSF maintains reliable time stamps. As the generated time stamps ensure the serial logging of audit events in the event of creating the audit history, it meets TOE security objective: O.Audit,O.Information gathering, O.Intrusion detection, O.Intrusion countermeasure.

FPT_TST.1 TSF testing	This component ensures self-tests for the correct operation of TSF and requires the function to prevent or detect TOE's failure by verifying the integrity of TSF data and TSF executable code, it meets TOE security objectives: O.Availability, O.TSF data protection.
FRU_FLT.1 Degraded fault tolerance	As this component ensures management activities through console or security management screen when TOE failures and guarantees the performance of information flow control function, it meets the TOE security objectives: O.Availability, O.Information flow control.
FRU_RSA.1 Maximum quotas	As this component blocks the DoS attacks by requiring maximum quotas of the TOE assets for each user, it meets the TOE security objective: O.DoS attack blocking.
FTA_SSL.1 TSF-initiated session locking	As this component requires the function for the TOE to lock the authorized session after a specified period of administrator inactivity, it meets TOE security objectives: O.TSF data protection.
FTA_SSL.3 TSF-initiated termination	As this component secures the availability of network service by requiring the external IT entity to terminate the session with the internal computer after a certain period of time, it meets TOE security objectives: O. DoS attack blocking.
FTP_ITC.1 Inter-TSF trusted channel	As this component requires the creation of the trusted channel when the authorized administrator manages the TOE locally or remotely, or when the TOE external vulnerability data servers communicate each other, it meets TOE security objectives: O.Administration, O.Authentication and O.TSF data protection.

8.2.2 IT assurance Requirements Rationale

IT assurance requirements rationale proves the following.

Each security functional requirement deals with at least one of the TOE or IT environment.

Security Objectives / Security Functional Requirements	OE. SECURE TOE REMOTE SERVER	OE.TIME
FPT_STM.1 Reliable Time stamps		X
FTP_ITC.1 Inter-TSF trusted channel	X	

[Table-25] Correlation between SFR and Security Objectives

SFR	Rationale
FPT_STM.1Reliable Time stamps	As this component means that the OS provides the reliable time stamps that are used in Audit (FAU_GEN.1), it supports security objectives OE.TIME toward the IT environment.
FTP_ITC.1 Secure channel	As this component provides secure communication channels between the TSF and the reliable IT products, it supports security objectives OE.Secure TOE external server toward the IT environment.

8.2.3 TOE assurance Requirements Rationale

The evaluation assurance level targeted by the TOE is EAL4, which requires the reinforcement of development document and vulnerability analysis, and automated configuration management in the process of development. The assurance documents necessary to satisfy the TOE assurance requirements, described in 6.2, are sufficient to satisfy the assurance requirements needed in EAL4 assurance level.

1) Rationale for the TOE assurance level of EAL4

- The TOE assurance level is determined as EAL4 to satisfy the claimed protection profile (Network Intrusion Prevention System Protection Profile V1.1, Dec. 21, 2005, KISA).

8.2.4 Additional Security Requirements Rationale

Security Ojectives / SFR	O. AVAILABILITY	O. AUDIT	O. ADMINISTRATION	O. TSF DATA PROTECTION	O. ANORMAL PACKET	O. DOS ATTACK	O. IDENTIFICATION	O. AUTHENTICATION	O. INFORMATION FLOW
FIA_UAU.4 Reuse Prevention authentication mechanism							•	•	

[Table-26] Additional Security Requirements Rationale

SFR	Rationale
FIA_UAU.4 Reuse Prevention authentication mechanism	As this component ensures to prevent the reuse of the authenticated data, it meets TOE security objectives: O.Identification, O.Authentication.

8.3 Dependency Rationale

8.3.1 TOE Security Functional Requirements Dependencies

The following table shows the dependencies among the functional components.

Number	Functional component	Dependency	Ref. No.
1	FAU_ARP.1	FAU_SAA.1	4
2	FAU_GEN.1	FPT_STM.1	30
3	FAU_GEN.2	FAU_GEN.1 FIA_UID.1	2 18
4	FAU_SAA.1	FAU_GEN.1	2
5	FAU_SAR.1	FAU_GEN.1	2
6	FAU_SAR.3	FAU_SAR.1	5
7	FAU_SEL.1	FAU_GEN.1 FMT_MTD.1	2 22
8	FAU_STG.1	FAU_GEN.1	2
9	FAU_STG.3	FAU_STG.1	8
10	FAU_STG.4	FAU_STG.1	8
11	FDP_IFC.1	FDP_IFF.1	12
12	FDP_IFF.1	FDP_IFC.1 FMT_MSA.3	11 21
13	FIA_AFL.1	FIA_UAU.1	15
14	FIA_ATD.1	-	-
15	FIA_UAU.1	FIA_UID.1	18
16	FIA_UAU.4	-	-
17	FIA_UAU.7	FIA_UAU.1	15
18	FIA_UID.2	-	-
19	FMT_MOF.1	FMT_SMF.1 FMT_SMR.1	24 25
20	FMT_MSA.1	[FDP_ACC.1 or FDP_IFC.1] FMT_SMF.1 FMT_SMR.1	11 24 25
21	FMT_MSA.3	FMT_MSA.1 FMT_SMR.1	20 25
22	FMT_MTD.1	FMT_SMF.1 FMT_SMR.1	24 25
23	FMT_MTD.2	FMT_MTD.1 FMT_SMR.1	22 25
24	FMT_SMF.1	-	-
25	FMT_SMR.1	FIA_UID.1	18
26	FPT_AMT.1	-	-
27	FPT_FLS.1	ADV_SPM.1	Assurance Requirement
28	FPT_RVM.1	-	-
29	FPT_SEP.1	-	-
30	FPT_STM.1	-	-
31	FPT_TST.1	FPT_AMT.1	26
32	FRU_FLT.1	FPT_FLS.1	27
33	FRU_RSA.1	-	-
34	FTA_SSL.1	FIA_UAU.1	15
35	FTA_SSL.3	-	-
36	FTP_ITC.1	-	-

[Table-27] Functional components dependencies

8.3.2 TOE Assurance Requirements Dependencies

This rationale can be omitted, because the dependencies for each assurance package provided by the Common Criteria for IT Security Evaluation are completely fulfilled.

8.4 TOE Summary Specification Rationale

The TOE summary specification rationale shall demonstrate that the IT security functions and assurance requirements are suitable to meet the TOE security functions and assurance measures, so that they are suitable to address security problems.

8.4.1. Correlations of Security Functional Requirements and TOE Security Functions

[Table-28] shows the correlation between IT security functional requirements and TOE security functions.

Category	TOE Security Functions	SFR
Audit (WFAU)	Audit data generation (WFAU_GEN)	FAU_ARP.1 Security alarms
		FAU_GEN.1 Audit data generation
		FAU_GEN.2 User identification association
		FAU_SAA.1 Potential violation analysis
	Audit data query (WFAU_SAR)	FAU_SAR.1 Audit review
		FAU_SAR.3 Selectable audit review
		FAU_SEL.1 Selective audit
User data protection (WFDP)	Firewall function (WFDP_FFU)	FDP_IFC.1(1) Subset Information flow control (1)
		FDP_IFF.1(1) Simple security Attributes (1)
		FPT_RVM.1 Non-bypassability of the TSP
	Blackhole blocking (WFDP_BLK)	FDP_IFC.1(2) Subset Information flow control (2)
		FDP_IFF.1(2) Simple security Attributes (2)
		FPT_RVM.1 Non-bypassability of the TSP
		FTA_SSL.3 TSF-initiated termination
	Qos blocking (WFDP_QOS)	FDP_IFC.1(3) Subset Information flow control (3)
		FDP_IFF.1(3) Simple security Attributes (3)
	Intrusion detecting function (WFDP_DET)	FAU_GEN.1 Audit data generation
		FAU_SAR.1 Audit review
		FAU_SAR.3 Selectable audit review
		FAU_SEL.1 Selective audit
	Intrusion analyzing function (WFDP_ALS)	FDP_IFC.1(4) Subset Information flow control (4)
		FDP_IFF.1(4) Simple security Attributes (4)
	Intrusion countermeasures (WFDP_ACT)	FAU_ARP.1 Security alarms
		FDP_IFC.1(4) Subset Information flow control (4)
		FDP_IFF.1(4) Simple security Attributes (4)
Identification and Authentication (WFIA)	User identification and authentication (WFIA_ACCESS)	FAU_ARP.1 Security alarms
		FAU_SAA.1 Potential violation analysis
		FIA_AFL.1 Authentication failure handling

		FIA_UAU.1 Authentication
		FIA_UAU.4 Reuse prevention authentication
		FIA_UAU.7 Protected authentication feedback
		FIA_UID.2(1) User identification before any
		FIA_UID.2(2) User identification before any
		FTP_ITC.1 Inter-TSF trusted channel
Security Management (WFMT)	Management of security audit functions (WFMT_AUDIT)	FAU_GEN.2 User identification association
		FMT_MOF.1 Management of security functions
		FMT_MTD.1(3) Management of TSF data (3)
		FMT_MTD.2(1) Management of limits on TSF
		FMT_SMF.1 Specification of management
		FPT_STM.1 Reliable time stamps
		FRU_FLT.1 Degraded fault tolerance
	OS Configuration (WFMT_CONFIG)	FAU_ARP.1 Security alarms
		FAU_SEL.1 Selective audit
		FAU_SAA.1 Potential violation analysis
		FAU_STG.3 Action in case of possible audit data
		FIA_AFL.1 Authentication failure handling
		FIA_ATD.1(1) User attribute Definition (1)
		FIA_ATD.1(2) User attribute Definition (2)
		FMT_MOF.1 Management of security functions
		FMT_MSA.1 Management of security attributes
		FMT_MTD.1(3) Management of TSF data (3)
		FMT_MTD.1(4) Management of TSF data (4)
		FMT_MTD.2(2) Management of limits on TSF
		FMT_SMF.1 Specification of management
		FMT_SMR.1 Security roles
		FPT_SEP.1 TSF domain Separation
		FPT_FLS.1 Failure with preservation of secure
		FPT_TST.1 TSF testing
		FRU_FLT.1 Degraded fault tolerance
		FTA_SSL.1 TSF-initiated session locking
	Security violation events evaluation (WFMT_POLDET)	FMT_MOF.1 Management of security functions
		FMT_MSA.3 Static attribute initialization
		FMT_MSA.1 Management of security attributes
		FMT_SMF.1 Specification of management
		FRU_RSA.1 Maximum quotas
		FMT_MTD.1(2) Management of TSF data (2)
	Management of firewall function (WFMT_POLFW)	FMT_MOF.1 Management of security functions
		FMT_MSA.1 Management of security attributes
		FMT_SMF.1 Specification of management
		FMT_MTD.1(1) Management of TSF data (1)
	Management of Interoperation between ESM and the Control Server(WFPT_INTSTDATA)	FMT_MOF.1 Management of security functions

		FMT_SMF.1 Specification of management functions
	IP POOL Management (WFMT_IPPOOL)	FMT_MOF.1 Management of security functions
		FMT_SMF.1 Specification of management
	Update (WFMT_UPD)	FMT_MOF.1 Management of security functions
		FMT_MTD.1(3) Management of TSF data (3)
		FMT_SMF.1 Specification of management
	QoS Policy (WFMT_POLQOS)	FRU_RSA.1 Maximum quotas
		FMT_MOF.1 Management of security functions
		FMT_MSA.1 Management of security attributes
		FMT_SMF.1 Specification of management
TSF protection (WFPT)	Management of Interoperation between ESM and the Control Server(WFPT_INTSTDATA)	FAU_STG.1 Protected audit trail storage
		FMT_MTD.1(3) Management of TSF data (3)
		FPT_TST.1 TSF Testing
	TSF transmitting data integrity check (WFPT_INTTRDATA)	FPT_TST.1 TSF Testing
		FTP_ITC.1 Inter-TSF trusted channel
	Prevention of audit data loss (WFPT_CHKDB)	FAU_STG.3 Action in case of possible audit data
		FAU_STG.4 Prevention of audit data loss
	Abstract machine testing (WFPT_ATM)	FPT_AMT.1 Abstract machine testing
	IPS status check (WFPT_CHKSYS)	FMT_MOF.1 Management of security functions
		FPT_FLS.1 Failure with preservation of secure
		FRU_FLT.1 Degraded fault tolerance

[Table-28] Correlations of security functional requirements and TOE security functions

8.4.2. TOE Summary Specification Rationale

This rationale demonstrates the following.

• Each security functional requirement is addressed by at least one TOE summary specification.

SFR	Rationale
Audit data generation (WFAU_GEN)	When the security management related events occur, as the TOE ensures to generate audit data by subject and entity for the identifier, event type and result, date and time of events, it corresponds to FAU_ARP.1, FAU_GEN.1, FAU_GEN.2, and FAU_SAA.1.
Audit data query (WFAU_SAR)	As the TOE ensures to query Audit records through the GUI, it corresponds to FAU_SAR.1, FAU_SAR.3, and FAU_SEL.1.

Firewall function (WFDP_FFU)	As the TOE ensures whether to allow or deny packet after comparing with the firewall policy, it corresponds to FPT_RVM.1, FDP_IFC.1 (1), and FDP_IFF.1 (1).
Blackhole blocking (WFDP_BLK)	As the TOE ensures to block in accordance to block method for each rule that is registered on the blackhole list, it corresponds to FTA_SSL.3, FPT_RVM.1, FDP_IFC.1 (2), and FDP_IFF.1 (2).
Qos blocking (WFDP_QOS)	As the TOE ensures to block according to the blocking method registered on the QoS Policy list, it corresponds to FDP_IFF.1 (3), FDP_IFC.1 (3).
Intrusion detecting function (WFDP_DET)	As the TOE ensures to collect information regarding the intrusion detection target events, it corresponds to FAU_GEN.1, FAU_SAR.1, FAU_SAR.3, and FAU_SEL.1.
Intrusion analyzing function (WFDP_ALS)	As the TOE ensures to block/detect intrusions by comparing with the blackhole and pattern block lists, it corresponds to FDP_IFF.1 (4), FDP_IFC.1 (4).
Intrusion countermeasures (WFDP_ACT)	The TOE corresponds to FAU_ARP.1, FDP_IFC.1 (4), and FDP_IFF.1 (4) as it performs detection, defense, and access control of the system for the protection.
User identification and authentication function (WFIA_ACCESS)	As it ensures to authenticate and identify whether he/she is a proper user to access and handle when it has failed to authenticate and identify, it corresponds to FAU_ARP.1, FAU_SAA.1, FIA_AFL.1, FIA_UAU.1, FIA_UAU.4, FIA_UAU.7, FIA_UID.2(1), FIA_UID.2(2). As identification and authentication data, internally transferred data of the TOE is encoded to SSL ensuring trusted communication channels; it corresponds to FTP_ITC.1.
Management of security audit functions (WFMT_AUDIT)	As it ensures to manage the security audit functions that include start-up and termination audit of the TOE, audit start-up and termination audit, access history management, access failure management, it corresponds to FMT_MOF.1, FMT_SMF.1. Also, as information on the TOE is recorded by the standards of the TOE time and as it ensures the function that unifies the TOE time and GMT time, it corresponds to FMT_MTD.1 (3), FPT_STM.1. As the TOE ensures to provide the back-up and repair function to cope with file damage, safekeeping of the stored medium usage setting and stored data, it corresponds to FMT_MTD.2(1). When operating TOE, as it ensures integrity check configuration of the files that are essential for execution, it corresponds to FMT_MTD.1 (3). As it correlates audit subject events and the user identification that

	caused the events, it corresponds to FAU_GEN.2. As it ensures the fault tolerance in case of the TOE failure, it corresponds to FRU_FLT.1
OS Configuration (WFMT_CONFIG)	As it ensures the configure, query by classifying roles of administrator who is capable of operating security functions of the TOE, it corresponds to FIA_ATD.1, FMT_MTD.1(3), FMT_MTD.1(4), FAU_SEL, FPT_SEP.1 and FMT_SMR.1 by the configuration of the number of access attempts limit. As the TOE ensures to configure the information regarding the observing victim host, it corresponds to FMT_MTD.1 (3). As the TOE ensures to provide log management setting and inquiry, alteration functions, in order to report the administrator a specified history of the user and server on protocol and service that the TOE handles, it corresponds to FMT_MSA.1, FMT_MTD.1(3). If it was considered to be a harmful information after comparing words appointed as harmful information with harmful information site, since it ensures to provide configuration, modification, deletion functions in order to block TCP session, it corresponds to FMT_MTD.1(3). As the TOE ensures to provide the authorized administrator a function that transmits the verification of the stored medium, Login failure, Integrity check, packet loss due to an excessive traffic, overload state of the CPU, failure state of the NIC by mail, it corresponds to FAU_ARP.1, FAU_SAA.1, FAU_STG.3, FIA_AFL.1, FPT_TST.1, FPT_FLS.1, FRU_FLT.1, FMT_SMF.1, FMT_MTD.2 (2). As the TOE ensures to operate the session locking function of the security function, it corresponds to FTA_SSL.1.
Management of the security violation events list (WFMT_POLDET)	As the TOE ensures to configure and manage detectable security violation events list, it corresponds to FMT_MSA.3, FMT_MSA.3, FRU_RSA.1, FMT_SMF.1, and FMT_MTD.1 (2).
Management of Firewall policy (WFMT_POLFW)	As the TOE ensures to configure and manage the firewall policy, it corresponds to FMT_MSA.1, FMT_SMF.1, and FMT_MTD.1 (1).
Management of interoperation between ESM and the control server regarding the security violation events (WFMT_ESM)	As the TOE ensures to provide control center interface to the authorized network administrator in order to transfer security violation events information to the control server and the ESM and also transfers system log to the administrator in case of OS failure, it corresponds to FMT_SMF.1, FMT_MOF.1.

IP POOL Management (WFMT_IPPOOL)	As the TOE provides IP POOL management function, it corresponds to FMT_MOF.1, FMT_SMF.1.
Update (WFMT_UPD)	As it ensures maintaining the latest figure of the TOE, it corresponds to FMT_MTD.1 (3), FMT_SMF.1.
QoS Policy (WFMT_POLQOS)	As it ensures to provide QoS Policy configuration function of the TOE, it corresponds to FRU_RSA.1, FMT_MTD.1, FMT_SMF.1, and FMT_MSA.1.
TSF stored data integrity check (WFPT_INTSTDATA)	As the TOE ensures integrity of the stored files, it corresponds to FAU_STG.1, FPT_TST.1, and FMT_MTD.1 (3).
TSF transmitting data integrity check (WFPT_INTTRDATA)	As the TOE ensures integrity of the transmitting data, it corresponds to FPT_TST.1. FPT_TST.1, FTP_ITC.1.
Prevention of audit data loss (WFPT_CHKDB)	As the TOE ensures to operate counter actions when it forecasts audit data loss, it corresponds to FAU_STG.3, FAU_STG.4.
Abstract machine testing (WFPT_ATM)	As the OS itself, when operates, ensures to proceed tests on memory inspection, normalcy of the file system, Daemon verification, module test, it corresponds to FPT_AMT.1.
IPS status check (WFPT_CHKSYS)	As the TOE ensures HA (high availability), status check on NIC port/line, it corresponds to FMT_MOF.1, FPT_FLS.1, FRU_FLT.1.

8.4.3 Correlations of Assurance Requirements and Assurance Measures

Assurance measure for each assurance component

The assurance measures for each assurance component are listed in the following table.

Assurance class	Assurance component		Assurance measures
Configuration Management	ACM_AUT.1	Partial CM automation	IPS60e_ Configuration Management Document
	ACM_CAP.4	Generation support and acceptance procedures	
	ACM_SCP.2	Problem tracking CM coverage	
Delivery and operation	ADO_DEL.2	Detection of modification	IPS60e_ Delivery Procedure
	ADO_IGS.1	Installation, generation, and start-up procedures	IPS60e_ Installation Manual
Development	ADV_FSP.2	Fully defined external interfaces	IPS60e_ Functional specification
	ADV_HLD.2	Security enforcing high-level design	IPS60e_ High-level Design
	ADV_IMP.1	Subset of the implementation of the TSF	IPS60e_ Validation Specification

	ADV_LLD.1	Descriptive low-level design	IPS60e_ Low-level Design
	ADV_RCR.1	Informal correspondence demonstration	IPS60e_Functional specification IPS60e_High-level Design IPS60e_Validation Specification IPS60e_Low-level Design IPS60e_Testing
	ADV_SPM.1	Informal TOE security policy model	IPS60e_Security Policy Modeling
Guidance documents	AGD_ADM.1	Administrator guidance	IPS60e_Administrator Guidance document
	AGD_USR.1	User guidance	
Life Cycle Support	ALC_DVS.1	Identification of security measures	IPS60e_Life Cycle Support
	ALC_LCD.1	Developer defined life-cycle model	
	ALC_TAT.1	Well-defined development tools	
Tests	ATE_COV.2	Analysis of coverage	IPS60e_Testing_
	ATE_DPT.1	Testing: high-level design	
	ATE_FUN.1	Functional testing	
	ATE_IND.2	Independent testing – sample	
Vulnerability assessment	AVA_MSU.2	Validation of analysis	IPS60e_Misuse Analysis
	AVA_SOF.1	Strength of TOE security function evaluation	IPS60e_Vulnerability Analysis
	AVA_VLA.2	Independent vulnerability Analysis	

[Table-29] Assurance measure

• ACM_AUT.1 Partial configuration management automation

- The TOE provides Configuration Management document on configuration managing.

• ACM_CAP.4 Generation support and acceptance procedures

- The TOE provides Configuration Management document on configuration managing.

• ACM_SCP.2 Problem tracking CM coverage

- The TOE provides Configuration Management document on configuration managing.

• ADO_DEL.2 Detection of modification

- The TOE provides distribution document to guarantee system controls and distribution facilities, procedures to assure that the receiver has received the TOE sent by the sender with its figure remaining intact.

• ADO_IGS.1 installation, generation, and operation procedures

- The TOE, in order to assure that it is being installed, generated, started on a secure manner as the developer intended, provides Installation quidance.

• ADV_FSP.2 Fully defined external interface

- The TOE provides a functional specification on functional specification that describes the TSF.

• ADV_HLD.2– high-level design

-The TOE provides a high-level design document of which the TSF functional specification is specified.

• ADV_IMP.1- the implementation of the TSF specification

- The TOE provides validation specification, the most concrete description of the TSF.

• ADV_LLD.1 Descriptive low-level design,

- The TOE provides descriptive low-level design document that is descriptive low-level design of the high-level design.

• ADV_RCR.1- correspondence of expression

- Correspondence of expression is included in functional and high-level design, high-level and descriptive low-level design, validation specification, and test paper.

• ADV_SPM.1 – Informal TOE security policy model

-A TSP model. Provides a security policy modeling.

• AGD_ADM.1– Administrator guidance

- Provides administrator guidance, a guidance document for the TOE.

• AGD_USR.1– User guidance

- As administrators, users of the TOE provide administrator guidance.

• ALC_DVS.1– Identification of security measures

- Provides life-cycle support documents to physical, procedural, personal, and other security means of the TOE development environment.

• ALC_LCD.1- Developer defined life cycle model

–Provides life-cycle support document.

• ALC_TAT.1- Well-defined development tools

- Provides life-cycle support documents to tools used for developing, analyzing, implementing the TOE.

• ATE_COV.2- Analysis of coverage

- Provides test papers regarding test requirements that prove the TSF satisfies security function requirements of TOE.

• ATE_DPT.1- Testing: high-level design

- Provides test papers for the high-level design test of the TOE

• ATE_FUN.1- Functional testing

- Provides test papers for the functional testings of the TOE.

• ATE_IND.2 - Independent testing - sample

- Provides testing tools for an independent testing of the TOE.

• AVA_MSU.2 – Guidance analysis

- Provides at the misuse analysis. .

• AVA_SOF.1 - Strength of TOE security function evaluation

- Provides vulnerability analysis regarding the Strength of TOE security function.

• AVA_VLA.2 - Independent vulnerability analysis

- Provides vulnerability analysis regarding the vulnerability of the TOE.

8.5 PP Claims Rationale

This ST accepted all security functional requirements from Network Intrusion Prevention System Protection Profile V1.1, Dec. 21, 2005, KISA). The added or modified requirements are shown in the following table.

Category	Item	Add/Modify
Assumption	A. Secure TOE external server	Add
	A.TIME	Add
	A. TOE SSL Certificate	Add
Security Objectives for the environment	OE. Secure TOE external server	Add
	OE.TIME	Add
	OE. SSL Protocol	Add

[Table-30] PP Claims rationale

Requirements of the Network Intrusion Prevention System PP are all included in this document (ST). A.Secure TOE external server, A.TIME, A.TOE SSL Certificate, OE.Secure TOE external server, and OE.TIME, OE.SSL protocol were added to this ST.

8.6 SOF Claim Rationale

This ST conforms to the SOF level claimed in the Network Intrusion Prevention System Protection Profile. Since the threat agent is considered to have low level of expertise, resources, and motivation, the PP should provide security functions of SOF-medium. Therefore this ST also requires SOF-medium in accordance with the SOF claim of the PP. IT security function, a user identification and authentication function, maps with FIA_UAU.1, FIA_UAU.4, FIA_UAU.7, FPT_TST.1 of the TSF, providing authentication methods that utilize password and disposable password.

Security Functional Class	Security Functional Component	
Identification and Authentication	FIA_UAU.1	Authentication
	FIA_UAU.4	Reuse prevention authentication mechanism

	FIA_UAU.7	Protected authentication feedback
TSF Protection	FPT_TST.1	TSF testing

[Table-31] Strength of function related security function and security functional requirements

Refer to the CEM. Table A.3, and you may able to calculate the exploiting value of the potential attacks as the following.

SNIPER assumes that the threat agent possesses low level of expertise, resources, and motivation.

Elapsed time for exploiting SNIPER is “>1 month” → Exploiting value is 8

Expertise is “Expert” → Exploiting value is 2.

Knowledge of TOE is “None” → Exploiting value is 0.

Access to TOE is “1 month” → Exploiting value is 9.

Equipment is “Standard” → Exploiting value is 2.

Elapsed time for identifying SNIPER is “<0.5 hour” → Identifying value is 0.

Expertise is “Layman” → Identifying value is 0.

Knowledge of TOE is “None” → Identifying value is 0.

Access to TOE is “<0.5 hour, or access undetectable” → Identifying value is 0.

Equipment is “None” → Identifying value is 0.

The total sum (Exploiting value 21 + Identifying value 0) is therefore 21.

According to CEM A.8, and since the vulnerability level of SNIPER falls into a range of 18-24, it satisfies SOF-medium.