Trustwave Network Access Control (NAC) Version 4.1 and Central Manager Software Version 4.1 Security Target

Version 1.9

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DOCUMENT INTRODUCTION

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REVISION HISTORY

Rev	Description
1.0	November 14, 2012, Initial release
1.1	March 11, 2013, Addressed certifier comments regarding TOE boundary
1.2	April 22, 2013, Addressed lab ORs
1.3	May 6, 2013, Addressed additional lab ORs
1.4	December 26, 2013, Changed to version 4.1
1.5	January 9, 2014, Addressed lab ORs
1.6	February 10, 2014, Clarified standalone appliance deployments
1.7	April 8, 2014, Added the Operator role and modified supported scan platforms
1.8	April 22, 2014, Updates for final code version
1.9	April 25, 2014, Updates for deep scan requirements

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ACRONYMS LIST

ARP	Address Resolution Protocol
CC	Common Criteria
CM	Central Manager
EAL	Evaluation Assurance Level
Gbps	GigaBits Per Second
HTTP	HyperText Transfer Protocol
IP	Internet Protocol
IT	Information Technology
I&A	Identification & Authentication
JRE	Java Runtime Environment
LAN	Local Area Network
MAC	Media Access Control
Mbps	MegaBits Per Second
NAC	Network Access Control
OS	Operating System
RADIUS	Remote Authentication Dial In User Service
RFC	Request For Comments
SF	Security Function
SFR	Security Functional Requirement
SMTP	Simple Mail Transfer Protocol
SMS	Systems Management Server
SNMP	Simple Network Management Protocol
SPAN	Switched Port ANalyzer
ST	Security Target
TCP	Transmission Control Protocol
TOE	Target of Evaluation
TSF	TOE Security Function
URL	Uniform Resource Locator
VLAN	Virtual Local Area Network
VoIP	Voice over Internet Protocol

1. Security Target Introduction

This Security Target (ST) describes the objectives, requirements and rationale for the Trustwave Network Access Control (NAC) Version 4.1 and Central Manager Software Version 4.1. The language used in this Security Target is consistent with the *Common Criteria for Information Technology Security Evaluation, Version 3.1* and all international interpretations through the date the TOE was accepted into evaluation. As such, the spelling of terms is presented using the internationally accepted English.

1.1 Security Target Reference

Trustwave Network Access Control (NAC) Version 4.1 and Central Manager Software Version 4.1 Security Target, Version 1.9, dated April 25, 2014.

1.2 TOE Reference

Trustwave Network Access Control (NAC) Version 4.1 (build 1600) and Central Manager Software Version 4.1 (build 1600)

1.3 Evaluation Assurance Level

Assurance claims conform to EAL2 (Evaluation Assurance Level 2) augmented by ALC_FLR.1 from the *Common Criteria for Information Technology Security Evaluation*, Version 3.1 Revision 4.

1.4 Keywords

Network Access Control, NAC, Compliance, Threat Detection, Mitigation, Remediation, Security, Risk Management

1.5 TOE Overview

1.5.1 Usage and Major Security Features

Trustwave’s NAC solution is an infrastructure-independent NAC that provides the following capabilities:

- Identity-based access control
- Device compliance checks
- Threat detection
- Automated policy enforcement

The Trustwave NAC solution enables network administrators to control which devices gain admission to their network and what network services they may invoke. The solution consists of a Central Manager (CM) and one or more Sensors. CM is used to configure the overall access policy for an enterprise and deploy it to Sensors. Sensors are connected to all the network segments that are controlled, and monitor all the network traffic to detect any violations of the network use policy configured by administrators.

As soon as a device attempts to gain access to the network, a Sensor immediately identifies the managed device and may be configured to run a policy check to determine if the device complies with the security policies in the network segment that it is trying to join.

Administrators may optionally configure policies to require the TOE to validate credentials supplied by the user of the managed device to the TOE internally or against an external credential server such as RADIUS or Active Directory. The credentials are exchanged between the managed devices and the TOE via an HTTPS connection. The cryptographic functionality in the TOE used to protect the confidentiality of the credentials has not been FIPS validated. Therefore, this optional functionality is not included in the evaluation.

When performing policy checks on managed devices, Sensors may perform monitoring of network traffic to identify attributes of the device and/or a deep scan via a Java applet downloaded to the device via an internet browser session. Network monitoring determines the device type, whether it is known or unknown, network function (e.g. IP telephony device, wireless device), and what services are currently running – such as instant messaging, file transfer protocol services, or peer-to-peer networking. Deep scans obtain more detailed information about the device configuration such as anti-virus version, signature update levels, OS patch levels and the absence or presence of spyware and firewall software. Devices can be re-checked throughout their lifecycle on the network. Deep scanning is performed by Portals, additional software executing on every Sensor within an enterprise. The Trustwave NAC solution supports scanning of Windows, Linux and MacOS platforms. However, only scanning of Windows platforms is included in the evaluation.

All of the information learned about a managed device is then used by Sensors to evaluate whether to admit each managed device to the network and what services each managed device may access. These decisions are determined by policies configured by administrators. Options that may be configured for network access include:

- Quarantine a device
- Restrict network access to explicitly listed services
- Redirect the device to a configured remediation server

After admission, Sensors monitor all network traffic, detect exceptions to the configured behavioral policy, and re-evaluate the network access permitted to the managed devices as new information about them is learned.

Administrators control and monitor the operation of Sensors via the CM. All CM users must identify and authenticate themselves before any management access is granted.

Each Sensor maintains a set of properties for the managed devices. The property values may be viewed and managed by administrators and operators.

1.5.2 TOE type

Network access control

1.5.3 Required Non-TOE Hardware/Software/Firmware

The network infrastructure and managed devices that the TOE monitors are not included in the TOE. Network switches, in particular, must be capable of forwarding a copy of all the LAN traffic for a segment to the Sensors in order to allow for monitoring of all traffic post-admission. This function is often performed via a SPAN port on the switches.

The TOE components and CM users communicate with one another via a segregated management network to prevent disclosure or modification of the data exchanged between TOE components. It is the responsibility of the operational environment to protect the traffic on the management network from other (non-TOE) devices.

Deep scans are used to gain additional knowledge about the individual managed devices, such as patch levels and whether or not anti-virus and personal firewall software is being used. This information may be used to determine more fine-grained network access permissions for the systems. In order for deep scans to be performed, the TOE downloads a Java application to the managed device. The managed devices must meet the following requirements to support the Java application.

Table 1 - Deep Scan Requirements for Windows Systems

Item	Requirements
Operating System	One of the following: Windows 7 Windows 2008 RTM – SP2 Windows Vista SP1 - SP2 Windows 2003 RTM - SP2
Internet Browser	One of the following: Microsoft Internet Explorer 5.0 or later Firefox 1.5 or later Netscape 8
Java Runtime Environment	One of the following: Sun JRE versions 6 & 7 (latest version)

HTTP may be used to access management web services on the CM. Any systems using this mechanism must be connected to the management network in order to protect the information exchanged. The minimum software requirements for systems using a browser to access the CM are:

1. Internet Explorer 7 or above, or
2. Mozilla Firefox 2 or above.

1.6 TOE Description

The Sensor component of the TOE provides network access control by enforcing administrator-configured policies for network traffic flows to or from managed devices using administrator-configurable rules. Sensors perform both pre-admission and post-admission checking. Pre-admission checks include automatic discovery of devices and policy compliance scanning. To accommodate specialized equipment such as VoIP phones and printers, administrators may exempt specific managed devices from any or all of these steps. Post-admission checks focus on continuous monitoring of the network traffic to enforce the configured behavioral policies.

The TOE includes the Trustwave Network Access Control (NAC) Sensor and Central Manager (CM) products, which consist of multiple logical components as follows distributed throughout an enterprise:

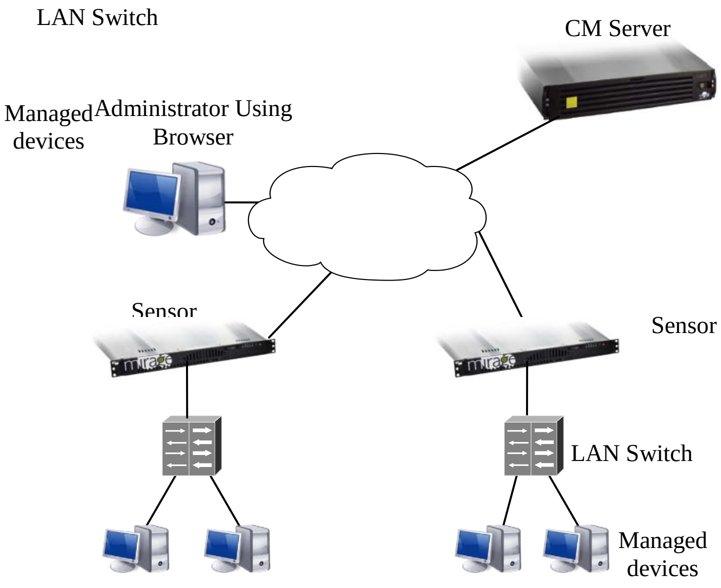
1. Sensors – The Sensor appliances host TOE software and are connected to one or more LAN segments to control network access for devices connected to the LAN segments. The Sensor component of NAC discovers managed devices and enforces the network access control policies. A single Sensor may service multiple LAN segments. Each

Sensor also provides Portal instances for deep scans. As many Sensors are deployed as are required to connect to all the monitored segments.

2. Portals – Portals perform the deep scans of managed devices. A Java application is dynamically downloaded from the Portal running on each Sensor to these managed devices when a scan is required. Multiple Portals may be configured for different groups to address differing compliance requirements within an enterprise.
3. CM – TOE software executing on a dedicated appliance that provides the control and monitoring interface for managing Sensors within an enterprise environment. CM communicates with individual Sensors.

A typical deployment for these components is shown in the following diagram.

Figure 1 - Typical TOE Deployment



The CM component is supported on the M-1 or M-10 appliance models. These models differ only in the number of Sensors they can manage and internal storage space; the security functionality is identical for all of the models.

Table 2 - CM Appliance Model Summary

Item	M-1	M-10
Network Ports	Two 100 Mbps/ 1 Gbps Ethernet	
Storage Space	160 Gb	1 Tb
Maximum Sensors Managed	5	100

The Sensor component is supported on the X-50, X-100, X-500, X-1000 or X-2500 appliance models. These models differ only in the number of VLANs/physical LAN segments they can monitor and the amount of network traffic they can process; the security functionality is identical for all of the models.

Table 3 - Sensor Appliance Model Summary

Item	X-50	X-100	X-500	X-1000	X-2500
Management Ports	One 100 Mbps/ 1 Gbps Ethernet	One 100 Mbps/ 1 Gbps Ethernet	Two 100 Mbps/ 1 Gbps Ethernet	Two 100 Mbps/ 1 Gbps Ethernet	Two 100 Mbps/ 1 Gbps Ethernet
Network Ports	Two 100 Mbps/ 1 Gbps Ethernet	Two 100 Mbps/ 1 Gbps Ethernet	Four 100 Mbps/ 1 Gbps Ethernet	Four 100 Mbps/ 1 Gbps Ethernet	Four or eight copper or fiber 1 Gbps
Monitored Traffic	Up to 1 Gb/s	Up to 1 Gb/s	Up to 1 Gb/s	Up to 1 Gb/s	Up to 1 Gb/s
Maximum VLANs	50	100	500	1000	2500

The X-series appliances shown above also support a Standalone configuration for hosting both NAC CM and Sensor functionality in a single appliance.

Additional details for the Sensor software components are provided in the following sections.

1.6.1 Sensors

The Sensor software executes on appliances and is responsible for monitoring all network traffic on one or more LAN segments. The traffic is analyzed to detect new devices and to scan ongoing traffic from all devices for unauthorized usage. The Sensor software responds to detected conditions by sending ARP messages to quarantine devices that violate configured policies or forwarding information between end devices and a Portal (on the Sensor) during deep scanning.

The Sensor software provides information to CM upon request, and processes configuration changes directed by the users of CM.

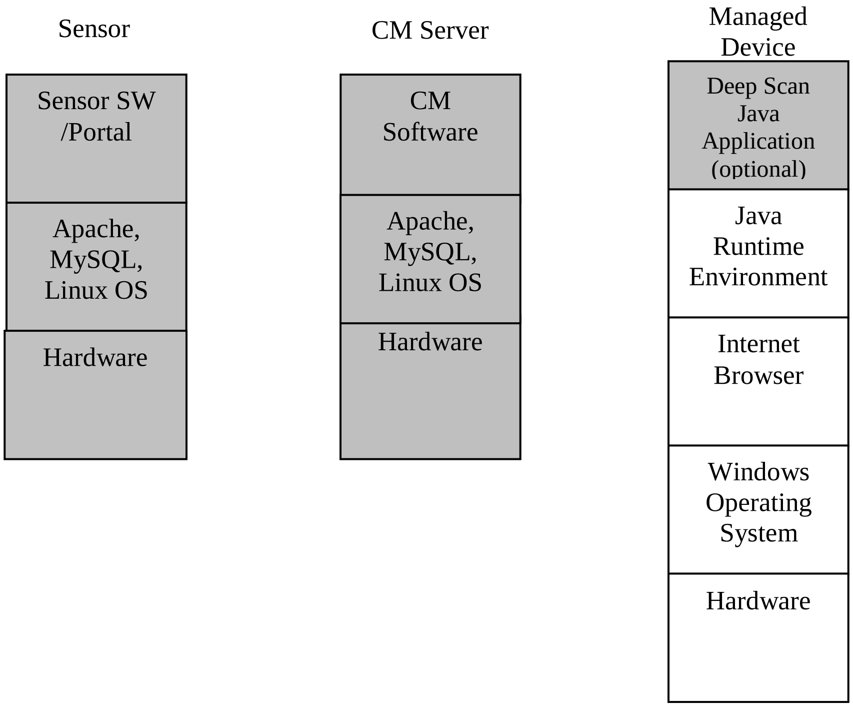
1.6.2 Portals

The Portal software executes on Sensors. It provides a Java application downloaded to managed devices that are required (by configured policy) to be scanned. The Java application gathers information from a managed device and returns it to the Portal to determine if each managed device is compliant with the configured policies. This component generates messages for security relevant events involving the managed devices.

1.7 Physical Boundary

The physical boundary of the TOE is the Sensor appliance (both hardware and all software), the CM appliance (both hardware and all software), and the Java application used to perform deep scans on managed devices, as depicted in the following diagram (shaded items are within the TOE boundary).

Figure 2 - Physical Boundary



The physical boundary also includes the following guidance documentation:

1. *Trustwave NAC X-[50, 100, 500, 1000] Hardware Guide*
2. *Trustwave NAC X-2500 Hardware Guide*
3. *Trustwave NAC M-1/M-10 Hardware Guide*
4. *Trustwave NAC 4.1 User Guide*
5. *Trustwave Central Manager Version 4.1 Getting Started Guide*
6. *Trustwave Network Access Control (NAC) Version 4.1 Installation Supplement*

1.8 Logical Boundary

1.8.1 Identification and Authentication

The TOE performs I&A for all users of CM. No access is provided to management functionality until I&A is successfully performed.

1.8.2 Management

The TOE provides management capability to enable the TOE to be controlled and monitored. Distinct roles are supported for CM so that different users can be granted different levels of access to the management functions.

1.8.3 Network Access Control

The TOE performs network access control on managed segments to enforce the configured policy for devices using the managed segments. The TOE monitors the traffic on managed segments to detect new devices and/or unauthorized behavior. The TOE performs network scans of known devices to determine their open network ports and other characteristics such as the base operating system. The TOE also provides a Java applet that can be downloaded to devices via a web browser to perform deeper scans of the systems to determine finer-grained characteristics.

When policy violations are detected, policies may direct the TOE to send ARP messages to the devices on a managed segment to quarantine an offending device, redirect devices to a configured server (e.g., remediation server), or validate user credentials with existing credential servers.

1.9 Evaluated Configuration

The evaluated configuration consists of the following TOE components, executing on systems complying with the minimum hardware and software requirements specified for each component:

1. One or more instances of a Sensor, including one or more Portals
2. One instance of the CM

In addition, the following configuration options must be specified to conform to the evaluated configuration:

1. All management of the TOE after installation is performed using the CM. The Terminal User Interface (TUI) to the appliances is only used during installation.
2. Bypassing the compliance scan is often necessary for network devices such as printers, HVAC controllers, badge readers, security cameras and network infrastructure devices, such as routers and switches. While configuring exclusions for these devices is a normal part of any NAC deployment, basing the exclusions on either the MAC or IP Address of the device poses risks, since malicious users may attempt to hijack the excluded device's address for the purposes of avoiding the compliance scan. As part of its device visibility functionality, Trustwave provides network-based OS detection of all devices in a managed segment. In order to maintain the integrity of an implemented security policy, Trustwave recommends leveraging this functionality for the purposes of excluding Embedded OS devices from compliance scanning. Setting compliance-scanning exclusions based upon endpoint OS characteristics makes it much more difficult for malicious users to bypass the security policy.
3. Usage of Monitored Access Zone Sub Zones is not recommended by Trustwave. Therefore Monitored Access Zone Sub Zones are not enabled.

1.10 Glossary

Access Zone - Network devices are grouped into Access Zones based on a series of characteristic condition tests that determine whether they are included or excluded from the zone. Devices can only be members of one zone at a time, although they can move between zones as their characteristics change. Each Access Zone has a set of profiles (Included and Excluded) associated with it that dictates how the devices are allowed to participate on the network.

Device - Computing resource that communicates on a network, i.e. laptop, desktop machine, printer, E-mail server, etc.

Device Session – The period of time a device is on the network, starting from the time a device not in a session is detected until the time activity from that device is no longer detected. The timeout for a device session is restarted every time a packet is monitored from it. If the timer expires, the TOE sends several directed ARP messages to it to see if a reply is received before declaring the session to be over.

Managed Devices - Devices with IP addresses within a managed segment address range.

Managed Segments - Segments being actively managed and monitored by the TOE, specified by a range of IP addresses.

Policy - A set of conditions that define how devices can enter, and operate within, an organization's network.

Profile - Composition of device properties and behavioral conditions that enables management of classes of devices as a single unit.

Response - Configurable action taken by the TOE, when a device either on the network or trying to connect to the network matches a profile contained in an Access Zone.

Scanning - Method of collecting device properties for NAC policy evaluation. The TOE collects service port, operating system, routing behavior, and connection type properties for devices scanned. Scanning can be configured to be performed when devices enter or leave an Access Zone.

SPAN Port - Switched Port Analyzer - Mirrors network traffic from a switched segment onto a specified port for traffic monitoring purposes.

Unmanaged Devices – Devices that send or receive network traffic via a managed segment, but that are not themselves connected to (have an IP address assigned to) a managed segment.

1.11 TSF Data

The following table describes the TSF data used in the TOE.

Table 4 - TSF Data Descriptions

TSF Data	Description
Access Zones	A grouping of managed segments and profiles that specify conditions for membership in an Access Zone. Profiles may be Include or Exclude. None of the configured Exclude profiles may match a device for it to join an Access Zone, and any or all (configurable) of the configured Include profiles must match. Membership is evaluated according to the ordered list of Access Zones. Each Access Zone defines actions required upon entry to the Access Zone as well as authorized actions by managed devices on the network while they are members of the Access Zone. Access Zones are defined by the following security-relevant information: • Include profiles • Exclude profiles • Restrict access – members of the Access Zone have access restricted according to the service access and HTTP response settings • Service access configuration – access may be permitted or

TSF Data	Description
	denied for an explicitly listed set of {protocol, port, IP address, source port} tuples. - HTTP response – a text message or Redirect URL may be returned to a device attempting HTTP access - Scanning properties – Specifies whether or not scanning is performed on devices that are members of the Access Zone.
Alert Destinations	Specify the set of SMTP, SNMP, and/or syslog destinations and parameters that may be recipient of alerts within each domain.
Alerts	A set of alerts generated upon configured conditions. Each alert is bound to an Access Zone, profile, or appliance. Access Zone alerts are bound to one of the Access Zones and occur upon entry to and/or exit from the Access Zone. Profile alerts are bound to one or more profiles and occur when a device first matches and/or no longer matches the profile. Appliance profiles are bound to an appliance and occur upon an appliance becoming ready, rebooting, or shutting down. All alerts include an alert destination selected from the list of destinations configured for the domain.
Appliances	Each appliance (Sensor) is defined by an IP address for intra-TOE communication and associated with a Group.
CM User Accounts	Defined accounts for authorized users of the CM. Each account includes a username (common name), userid, password, lock status and role.
Compliance Configuration	Defines the compliance requirements for managed devices in a group during scans. Attributes include: - Group - Requirements for operating system, firewall, antivirus, and antispyware - Schedule for recurring scans - Messages to be displayed to users upon failure
Forced Access Zone Bindings	Managed devices are normally bound to Access Zones automatically based upon matched profiles and the profiles in Access Zone include and exclude lists. Alternatively, managed devices may be forced into an Access Zone by administrators and operators. Devices stay in that Access Zone until the forced binding is removed.
Groups	A grouping of managed resources organized into a hierarchical structure. By default a single group (Global) exists at the top of the hierarchy. A group consists of the following security-relevant information: - Access Zones - Active Access Zones - Appliances - Alert destinations - Alerts - Managed segments - Available profiles - Portal - Compliance configuration Group configuration settings apply to all subordinate groups unless they are explicitly overridden for a sub-group.

TSF Data	Description
Managed Device Attributes	A set of attributes discovered about a managed device based upon traffic analysis, authentication of user-supplied credentials, and compliance scans. These attributes are compared to the conditions specified in profiles to determine Access Zone membership. Attributes may include • Access Zone membership - A managed device may only belong to one zone at a time. Membership is automatically determined by the TOE based upon the configured profiles and device attributes. • Matched profiles – A list of profiles that each device matches. • MAC address • IP address • Operating system name, version, missing patch severity, SMS configuration, SMS last scanned • Operating system missing patch level • Anti-Spyware software installed, enabled, version, last scanned, last updated • Anti-Virus software installed, enabled, version, last scanned, last updated • Firewall software installed, enabled • Router • Gateway • IP Telephony • Registered • MAC/IP address binding locked • Managed • Wireless • Open network ports/services • Authenticated
Managed Segments	The monitoring interfaces within a Sensor are defined by segments, which are paired interfaces – one for receiving all the traffic via a switch mirror or SPAN port, and one used for sending network traffic from the Sensor. The attributes for each segment are the IP address/subnet mask and (optionally) a VLAN.
Portals	Define a web service associated with a Group to handle authentication and scanning. Attributes include: • Group • Fully Qualified Domain Name (FQDN) • IP Address • Branding
Profiles	Profiles define matching criteria for device properties and conditions. They are used to enforce NAC policy across the network of managed segments, and drive alert notifications when violated. Profiles also serve as Access Zone membership criteria, defining the conditions under which a device is included in or excluded from the Access Zone. A profile consists of the following information: • Include conditions – All include conditions must match. • Exclude conditions – No exclude conditions can match.

2. Conformance Claims

2.1 Common Criteria Conformance

Common Criteria version: Version 3.1 Revision 4, September 2012

Common Criteria conformance: Part 2 extended and Part 3 conformant

2.2 Security Requirement Package Conformance

The TOE is conformant with EAL2 augmented by ALC_FLR.1.

The TOE does not claim conformance to any security functional requirement packages.

2.3 Protection Profile Conformance

The TOE does not claim conformance to any registered Protection Profile.

3. Security Problem Definition

3.1 Introduction

This chapter defines the nature and scope of the security needs to be addressed by the TOE. Specifically this chapter identifies:

A) assumptions about the environment,

B) threats to the assets, and

C) organisational security policies.

This chapter identifies assumptions as A.*assumption*, threats as T.*threat* and policies as P.*policy*.

3.2 Assumptions

The specific conditions listed in the following table are assumed to exist in the TOE environment.

Table 5 - Assumptions

A.Type	Description
A.ARP	Managed devices will process received Address Resolution Protocol messages as specified in RFCs 826, 5227 and 5494.
A.ENVIRON	The TOE will be located in an environment that provides physical security, uninterruptible power, and temperature control required for reliable operation.
A.INSTALL	The Administrator will install and configure the TOE according to the administrator guidance.
A.NETWORK	There will be a segregated management network that supports communication between distributed components of the TOE. This network functions properly.
A.NOEVILADMIN	Administrators are non-hostile and follow the administrator guidance when using the TOE. Administration is competent and on-going.

3.3 Threats

The threats identified in the following table are addressed by the TOE and the Operational Environment.

Table 6 - Threats

T.Type	TOE Threats
T.MASQUERADE	A user or process may masquerade as another entity in order to gain unauthorized access to data or TOE resources.
T.UNAUTH_ACCESS	Authorized devices may attempt unauthorized access to other IT systems via the network.
T.UNAUTH_CONFIG	Devices with unauthorized configurations may access protected information via the network, and because of the unauthorized configuration fail to protect that information from unauthorized disclosure.

T.Type	TOE Threats
T.UNAUTH_DEVICES	Unauthorized devices may attempt to access systems or data on the network.

3.4 Organisational Security Policies

The organizational security policies identified in the following table are addressed by the TOE and the Operational Environment.

Table 7 - OSPs

T.Type	OSPs
P.MANAGE	The authorized administrators of the TOE must have the necessary functions and facilities to effectively manage the TOE.

4. Security Objectives

This section identifies the security objectives of the TOE and the TOE's Operational Environment. The security objectives identify the responsibilities of the TOE and the TOE's Operational Environment in meeting the security needs. Objectives of the TOE are identified as *O.objective*. Objectives that apply to the operational environment are designated as *OE.objective*.

4.1 Security Objectives for the TOE

The TOE must satisfy the following objectives.

Table 8 - Security Objectives for the TOE

O.Type	Security Objective
O.DETECT_DEVICES	The TOE will provide the capability to detect new devices on managed segments.
O.I&A	The TOE will provide the capability to identify and authenticate administrators.
O.IDANLZ	The TOE must apply analytical processes and information to information learned about managed devices to derive and store conclusions about unauthorized network usage or noncompliant device security configurations (past, present, or future).
O.IDSCAN	The TOE must collect static configuration information that might be indicative of the potential for future unauthorized network usage or noncompliant device security configurations, or the occurrence of past unauthorized network usage or noncompliant device security configurations of a managed device.
O.IDSENS	The TOE must collect information about all events that are indicative of inappropriate activity that may have resulted from misuse, access, or malicious activity of managed devices.
O.MANAGE	The TOE will provide all the functions and facilities necessary to support the administrators in their management of the security of the TOE.
O.RESTRICT_DEVICES	The TOE will provide the capability to restrict network access to and from devices based upon the derived conclusions about unauthorized network usage or noncompliant device security configurations.
O.TIME_STAMP	The TOE will provide reliable time stamps for system data records.
O.TOE_ACCESS	The TOE will provide mechanisms that control a user's logical access to the TOE.

4.2 Security Objectives for the Operational Environment

The TOE's operational environment must satisfy the following objectives.

Table 9 - Security Objectives of the Operational Environment

OE.Type	Operational Environment Security Objective
OE.ARP	IT systems on managed segments shall process Address Resolution Protocol messages according to RFCs 826, 5227, and 5494.
OE.COMM	The Operational Environment will protect communication between distributed components of the TOE from disclosure.

OE.Type	Operational Environment Security Objective
OE.ENVIRON	The Administrator will install the TOE in an environment that provides physical security, uninterruptible power, and temperature control required for reliable operation.
OE.INSTALL	The Administrator will install and configure the TOE according to the administrator guidance.
OE.MIRROR	The operational environment will provide the capability to provide a copy of all network traffic on managed segments to the TOE.
OE.NETWORK	The Administrator will install and configure a segregated management network that supports communication between the distributed TOE components. The administrator will ensure that this network functions properly.
OE.NOEVILADMIN	Administrators are non-hostile and follow the administrator guidance when using the TOE. Administration is competent and on-going.

5. Extended Components Definition

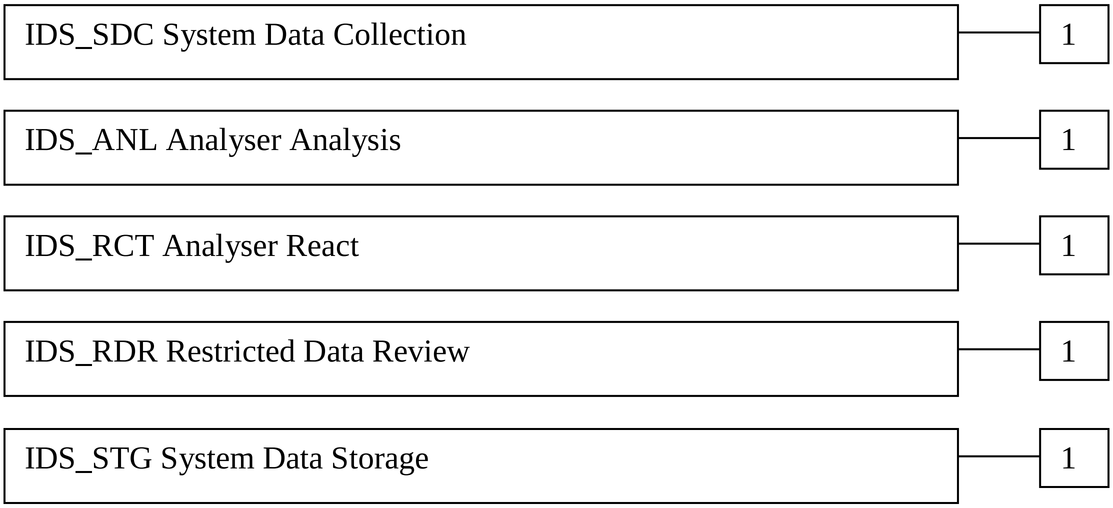
5.1 Extended Security Functional Components

5.1.1 Class IDS: Intrusion Detection

All of the components in this section are based on the U.S. Government Protection Profile Intrusion Detection System System For Basic Robustness Environments.

This class of requirements is taken from the IDS System PP to specifically address the data collected and analysed by an IDS scanner and analyzer. The audit family of the CC (FAU) was used as a model for creating these requirements. The purpose of this class of requirements is to address the unique nature of system data and provide for requirements about collecting, reviewing and managing the data.

Application Note: The PP does not provide hierarchy and dependency information for the extended SFRs defined in the PP. This information has been derived from the model SFRs referenced by the PP.


IDS_SDC System Data Collection
1
IDS_ANL Analyser Analysis
1
IDS_RCT Analyser React
1
IDS_RDR Restricted Data Review
1
IDS_STG System Data Storage
1

5.1.1.1 IDS_SDC System Data Collection

Family Behaviour:

This family defines the requirements for the TOE regarding collection of information related to security events.

Component Levelling:

IDS_SDC System Data Collection
1

IDS_SDC.1 System Data Collection provides for the functionality to require TSF collection of data that may be related to security events.

Management:

The following actions could be considered for the management functions in FMT:

a) Configuration of the events to be collected.

Audit:

There are no auditable events foreseen.

IDS_SDC.1 System Data Collection

Hierarchical to: No other components.

Dependencies: FPT_STM.1 Reliable time stamps

IDS_SDC.1.1 **The System shall be able to collect the following information from the targeted IT System resource(s):**

a) **[selection: *Start-up and shutdown, identification and authentication events, data accesses, service requests, network traffic, security configuration changes, data introduction, detected malicious code, access control configuration, service configuration, authentication configuration., accountability policy configuration, detected known vulnerabilities*]; and**

b) **[assignment: *other specifically defined events*].**

IDS_SDC.1.2 **At a minimum, the System shall collect and record the following information:**

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

b) **The additional information specified in the Details column of the table below.**

Table 10 - System Data Collection Events and Details

Component	Item	Details
IDS_SDC.1	Anti-Spyware status	Anti-spyware installed, enabled, scan last completed time, software last updated time
IDS_SDC.1	Anti-Virus status	Anti-virus installed, enabled, scan last completed time, software last updated time
IDS_SDC.1	Firewall status	Firewall installed, enabled
IDS_SDC.1	Network function	Gateway, web server, wireless device, IP telephony device
IDS_SDC.1	Operating System	Operating system identification
IDS_SDC.1	Operating System patch status	Auto update configuration, missing patches, missing patch severity level
IDS_SDC.1	Suspicious network behavior	Profile condition specifying the behaviour (specific packet contents, excessive unique device contacts, excessive port accesses, or MAC/IP address locking violation) detected
IDS_SDC.1	Service configuration	Service identification (name or port), interface, protocols

Application Note: The rows in this table must be retained that correspond to the selections in IDS_SDC.1.1 when that operation is completed. If additional events are defined in the assignment in IDS_SDC.1.1, then corresponding rows should be added to the table for this element.

5.1.1.2 IDS_ANL Analyser Analysis

Family Behaviour:

This family defines the requirements for the TOE regarding analysis of information related to security events.

Component Levelling:

IDS_ANL.1 Analyser Analysis provides for the functionality to require TSF controlled analysis of data collected that is related to security events.

Management:

The following actions could be considered for the management functions in FMT:

a) Configuration of the analysis to be performed.

Audit:

There are no auditable events foreseen.

IDS_ANL.1 Analyser Analysis

Hierarchical to: No other components.

Dependencies: IDS_SDC.1 System Data Collection

FPT_STM.1 Reliable time stamps

IDS_ANL.1.1 **The System shall perform the following analysis function(s) on all System data received:**

a) **[selection: *statistical, signature, integrity*]; and**

b) **[assignment: *other analytical functions*].**

Application Note: Statistical analysis involves identifying deviations from normal patterns of behaviour. For example, it may involve mean frequencies and measures of variability to identify abnormal usage. Signature analysis involves the use of patterns corresponding to known attacks or misuses of a system. For example, patterns of system settings and user activity can be compared against a database of known attacks. Integrity analysis involves comparing system settings or user activity at some point in time with those of another point in time to detect differences.

IDS_ANL.1.2 **The System shall record within each analytical result at least the following information:**

a) **Date and time of the result, type of result, identification of data source; and**

b) **[assignment: *other security relevant information about the result*].**

Application Note: The analytical conclusions drawn by the analyser should both describe the conclusion and identify the information used to reach the conclusion.

5.1.1.3 IDS_RCT Analyser React

Family Behaviour:

This family defines the requirements for the TOE regarding reactions to the analysis of information related to security events received from remote IT systems when a vulnerability is detected.

Component Levelling:

IDS_RCT.1 Analyser React provides for the functionality to require TSF controlled reaction to the analysis of data received from remote IT systems regarding information related to security events when an intrusion is detected.

Management:

The following actions could be considered for the management functions in FMT:

a) the management (addition, removal, or modification) of actions.

Audit:

There are no auditable events foreseen.

IDS_RCT.1 Analyser React

Hierarchical to: No other components.

Dependencies: IDS_ANL.1 Analyser Analysis

IDS_RCT.1.1 **The System shall send an alarm to [assignment: *alarm destination*] and take [assignment: *appropriate actions*] when a vulnerability is detected.**

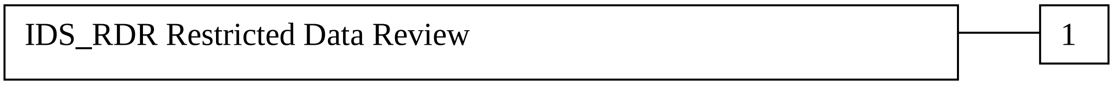
Application Note: There must be an alarm, though the ST should refine the nature of the alarm and define its target (e.g., administrator console, audit log). The TSF may optionally perform other actions when vulnerabilities are detected; these actions should be defined in the ST.

5.1.1.4 IDS_RDR Restricted Data Review

Family Behaviour:

This family defines the requirements for the TOE regarding review of the System data collected or generated by the TOE.

Component Levelling:



IDS_RDR.1 Restricted Data Review provides for the functionality to require TSF controlled review of the System data collected or generated by the TOE.

Management:

The following actions could be considered for the management functions in FMT:

a) maintenance (deletion, modification, addition) of the group of users with read access right to the System data records.

Audit:

The following actions should be auditable if FAU_GEN Security audit data generation is included in the ST:

a) Basic: Attempts to read System data that are denied.

b) Detailed: Reading of information from the System data records.

IDS_RDR.1 Restricted Data Review

Hierarchical to: No other components.

Dependencies: IDS_SDC.1 System Data Collection
IDS_ANL.1 Analyser Analysis

IDS_RDR.1.1 **The System shall provide [assignment: *authorised users*] with the capability to read [assignment: *list of System data*] from the System data.**

Application Note: This requirement applies to authorised users of the System. The requirement is left open for the writers of the ST to define which authorised users may access what System data.

IDS_RDR.1.2 **The System shall provide the System data in a manner suitable for the user to interpret the information.**

IDS_RDR.1.3 **The System shall prohibit all users read access to the System data, except those users that have been granted explicit read-access.**

5.1.1.5 IDS_STG Guarantee of System Data Availability

Family Behaviour:

This family defines the requirements for the TOE to be able to create and maintain a secure System data trail.

Component Levelling:

IDS_STG.1 Guarantee of System Data Availability requires that the System data be protected from unauthorised deletion and/or modification and defines the behaviour when specific conditions occur.

Management:

The following actions could be considered for the management functions in FMT:

a) maintenance of the parameters that control the System data storage capability.

Audit:

There are no auditable events foreseen.

IDS_STG.1 Guarantee of System Data Availability

Hierarchical to: No other components.

Dependencies: IDS_SDC.1 System Data Collection
IDS_ANL.1 Analyser Analysis

IDS_STG.1.1 The System shall protect the stored System data from unauthorised deletion.

IDS_ STG.1.2 The System shall protect the stored System data from modification.

Application Note: Authorised deletion of data is not considered a modification of System data in this context. This requirement applies to the actual content of the System data, which should be protected from any modifications.

IDS_ STG.1.3 The System shall ensure that [assignment: metric for saving System data] System data will be maintained when the following conditions occur: [selection: System data storage exhaustion, failure, attack].

5.2 Extended Security Assurance Components

No extended security assurance components are defined.

6. Security Requirements

This section contains the functional requirements that are provided by the TOE. These requirements consist of functional components from Part 2 of the CC.

The CC defines operations on security requirements. The font conventions listed below state the conventions used in this ST to identify the operations.

Assignment: indicated in italics

Selection: indicated in underlined text

Assignments within selections: indicated in italics and underlined text

Refinement: indicated with bold text

Iterations of security functional requirements may be included. If so, iterations are specified at the component level and all elements of the component are repeated. Iterations are identified by numbers in parentheses following the component or element (e.g., FAU_ARP.1(1)).

6.1 TOE Security Functional Requirements

The functional requirements are described in detail in the following subsections. Additionally, these requirements are derived verbatim from Part 2 of the *Common Criteria for Information Technology Security Evaluation* with the exception of completed operations.

6.1.1 User Data Protection (FDP)

6.1.1.1 FDP_IFC.1 Subset Information Flow Control

FDP_IFC.1.1 The TSF shall enforce the *Access Zone Service Restriction SFP* on

1. *Subjects: Managed devices.*
2. *Information: IP datagrams with destination MAC addresses in the range of values used for service restrictions (00:9c:xx:xx:xx:xx) received on managed segments.*
3. *Operations: Forward, discard, HTTP redirect, HTTP response.*

6.1.1.2 FDP_IFF.1 Simple Security Attributes

FDP_IFF.1.1 The TSF shall enforce the *Access Zone Service Restriction SFP* based on the following types of subject and information security attributes:

1. *Managed devices: Access Zone membership.*
2. *IP datagram: Source MAC address, destination MAC address, source IP address, destination IP address, IP protocol field, source TCP/UDP port, destination TCP/UDP port, TCP flags, ICMP type.*

FDP_IFF.1.2 The TSF shall permit an information flow between a controlled subject and controlled information via a controlled operation if the following rules hold:

1. *For IP datagrams sent from a managed device with membership in an Access Zone with service restrictions:*
   a. *If any of the service restriction rules for permitted flows match the attributes of the IP datagram, processing continues with step 2.*

   b. *If the incoming packet is HTTP (based on the destination TCP port), the destination IP address matches the Portal IP address, and the current Access Zone has Scanning enabled, the packet is delivered to the Portal for the scanning process.*

   c. *If the service restriction rules specify HTTP redirection and the incoming packet is HTTP (based on the destination TCP port), an HTTP Redirect with the configured URL is sent to the source of the IP datagram and the incoming IP datagram is discarded.*

   d. *If the service restriction rules specify HTTP response and the incoming packet is HTTP (based on the destination TCP port), an HTTP response with the configured message is sent to the source of the IP datagram and the incoming IP datagram is discarded.*

   e. *The incoming IP datagram is discarded and processing stops.*

2. *For IP datagrams sent to a managed device with membership in an Access Zone with service restrictions:*

   a. *If any of the service restriction rules for permitted flows match the attributes of the IP datagram, processing continues with step 3.*

   b. *The incoming IP datagram is discarded and processing stops.*

3. *The IP datagram is forwarded to the managed device after substituting the destination MAC address of the true destination and the source MAC address used for service restrictions of the originator of the IP datagram.*

FDP_IFF.1.3 The TSF shall enforce the *no additional information flow control SFP rules*.

FDP_IFF.1.4 The TSF shall explicitly authorise an information flow based on the following rules: *none*.

FDP_IFF.1.5 The TSF shall explicitly deny an information flow based on the following rules: *none*.

6.1.2 Identification and Authentication (FIA)

6.1.2.1 FIA_AFL.1 Authentication Failure Handling

FIA_AFL.1.1 The TSF shall detect when 4 unsuccessful authentication attempts occur related to *CM logins*.

FIA_AFL.1.2 When the defined number of unsuccessful authentication attempts has been met or surpassed, the TSF shall *automatically lock the account for 15 minutes*.

6.1.2.2 FIA_ATD.1 User Attribute Definition

FIA_ATD.1.1 The TSF shall maintain the following list of security attributes belonging to individual users :

1. *Userid.*
2. *Password.*
3. *Username.*

4. *Role.*
5. *Lock status*

6.1.2.3 FIA_SOS.1 Verification of Secrets

FIA_SOS.1.1 The TSF shall provide a mechanism to verify that secrets meet *the following rules:*

1. *Passwords must be at least 6 characters long.*
2. *Passwords must contain a lower case character a-z.*
3. *Passwords must contain an upper case character A-Z.*
4. *Passwords must contain a number 0-9.*

6.1.2.4 FIA_UAU.2 User Authentication Before any Action

FIA_UAU.2.1 The TSF shall require each user to be successfully authenticated before allowing any other TSF-mediated actions on behalf of that user.

6.1.2.5 FIA_UAU.7 Protected Authentication Feedback

FIA_UAU.7.1 The TSF shall provide only *dots echoed back to the user as characters are typed for passwords* to the user while the authentication is in progress.

6.1.2.6 FIA_UID.2 User Identification Before any Action

FIA_UID.2.1 The TSF shall require each user to be successfully identified before allowing any other TSF-mediated actions on behalf of that user.

6.1.2.7 FIA_USB.1 User-Subject Binding

FIA_USB.1.1 The TSF shall associate the following user security attributes with subjects acting on behalf of that user: *username, userid, and role*.

FIA_USB.1.2 The TSF shall enforce the following rules on the initial association of user security attributes with subjects acting on the behalf of users: *the attributes are associated with a session when Identification & Authentication is successful*.

FIA_USB.1.3 The TSF shall enforce the following rules governing changes to the user security attributes associated with subjects acting on the behalf of users: *the attributes do not change during a session.*

6.1.3 Security Management (FMT)

6.1.3.1 FMT_MOF.1 Management of Security Functions Behaviour

FMT_MOF.1.1 The TSF shall restrict the ability to determine the behaviour of, disable, enable, modify the behaviour of the functions *specified in the following table* to *the authorised identified roles in the following table*.

Table 11 - FMT_MOF.1 Details

Function	Administrator	Operator	Observer	Provisioner
Potential security violation definitions	Determine, Disable/Enable, Modify	Determine	Determine	None

Function	Administrator	Operator	Observer	Provisioner
Responses to potential security violations	Determine, Disable/Enable, Modify	Determine	Determine	None

6.1.3.2 FMT_MTD.1 Management of TSF Data

FMT_MTD.1.1 The TSF shall restrict the ability to query, modify, delete the *items listed in the following table* to *Administrator, Operator, Observer, and Provisioner roles via CM as specified in the following table*.

Table 12 - TSF Data Management Details For CM

TSF Data	Administrator	Operator	Observer	Provisioner
Access Zones	Query, modify and delete	Query	Query	None
Alert Destinations	Query, modify and delete	None	None	None
Alerts	Query, modify and delete	None	None	None
Appliances	Query	Query	Query	None
CM User Accounts	Query, modify and delete	Query	Query	None
Compliance Configuration	Query, modify and delete	None	None	None
Forced Access Zone Bindings	Query, modify and delete	Query, modify and delete	Query	None
Groups	Query, modify and delete	Query	Query	None
Managed Device Attributes	Query and modify	Query and modify	Query	None
Managed Segments	Query, modify and delete	Query	Query	None
Portals	Query, modify and delete	None	None	None
Profiles	Query, modify and delete	Query	Query	None

Application Note: Because the functionality for authentication of users on managed devices is not included in the evaluation, the Provisioner role has no practical purpose since their privileges are limited to configuring Guest accounts.

6.1.3.3 FMT_SMF.1 Specification of Management Functions

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

1. *Manage CM User Accounts.*
2. *Manage Access Zone configurations.*
3. *Manage Sensor configurations (including managed segments).*
4. *Manage device assignments to Access Zones.*

5. *Manage profiles.*
6. *Manage Alerts.*
7. *Monitor device status.*

6.1.3.4 FMT_SMR.1 Security Roles

FMT_SMR.1.1 The TSF shall maintain the roles *administrator, operator, observer, and provisioner.*

FMT_SMR.1.2 The TSF shall be able to associate users with roles.

6.1.4 Protection of the TSF (FPT)

6.1.4.1 FPT_STM.1 Reliable Time Stamps

FPT_STM.1.1 The TSF shall be able to provide reliable time-stamps.

6.1.5 IDS Component Requirements (IDS)

6.1.5.1 IDS_SDC.1 System Data Collection

IDS_SDC.1.1 The System shall be able to collect the following information from the targeted IT System resource(s):

a) service configuration; and

b) *Anti-Spyware status, Anti-Virus status, Firewall status, network function, Operating System, Operating System patch status, and suspicious network behaviour.*

IDS_SDC.1.2 At a minimum, the System shall collect and record the following information:

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

b) The additional information specified in the *Details* column of **the table below**.

Table 13 - System Data Collection Details

Component	Item	Details
IDS_SDC.1	Anti-Spyware status	Anti-spyware installed, enabled, scan last completed time, software last updated time
IDS_SDC.1	Anti-Virus status	Anti-virus installed, enabled, scan last completed time, software last updated time
IDS_SDC.1	Firewall status	Firewall installed, enabled
IDS_SDC.1	Network function	Gateway, web server, wireless device, IP telephony device
IDS_SDC.1	Operating System	Operating system identification
IDS_SDC.1	Operating System patch status	Auto update configuration, missing patches, missing patch severity level

Component	Item	Details
IDS_SDC.1	Suspicious network behavior	Profile condition specifying the behaviour (specific packet contents, excessive unique device contacts, excessive port accesses, or MAC/IP address locking violation) detected
IDS_SDC.1	Service configuration	Service identification (name or port), interface, protocols

6.1.5.2 IDS_ANL.1 Analyser Analysis

IDS_ANL.1.1 The System shall perform the following analysis function(s) on all System data received:

a) Statistical, signature, integrity; and

b) *Comparison of the device attributes to profiles in active Access Zones to determine the managed device's Access Zone membership*.

IDS_ANL.1.2 The System shall record within each analytical result at least the following information:

a) Date and time of the result, type of result, identification of data source; and

b) *Managed device, and the property type (Access Zone or Profile)*.

6.1.5.3 IDS_RCT.1 Analyser React

IDS_RCT.1.1 The System shall send an alarm to *the alert destination configured for the Access Zone the managed device is assigned to or for the matching profiles determined for the managed device* and take *the service restriction actions configured for the Access Zone the managed device is assigned to* when **unauthorized network usage or noncompliant device security configuration** is detected.

6.1.5.4 IDS_RDR.1 Restricted Data Review

IDS_RDR.1.1 The System shall provide *users with administrator, operator or observer roles* with the capability to read *System data analytical results* from the System data.

IDS_RDR.1.2 The System shall provide the System data in a manner suitable for the user to interpret the information.

IDS_RDR.1.3 The System shall prohibit all users read access to the System data, except those users that have been granted explicit read-access.

6.1.5.5 IDS_STG.1 Guarantee of System Data Availability

IDS_STG.1.1 The System shall protect the stored System data from unauthorised deletion.

IDS_ STG.1.2 The System shall protect the stored System data from modification.

Application Note: Authorised deletion of data is not considered a modification of System data in this context. This requirement applies to the actual content of the System data, which should be protected from any modifications.

IDS_ STG.1.3 The System shall ensure that *the oldest* System data will be maintained when the following conditions occur: System data storage exhaustion.

6.2 TOE Security Assurance Requirements

The TOE meets the assurance requirements for EAL2 augmented by ALC_FLR.1. These requirements are summarised in the following table.

Table 14 - EAL2+ Assurance Requirements

Assurance Class	Component ID	Component Title
Development	ADV_ARC.1	Security architecture description
	ADV_FSP.2	Security-enforcing functional specification
	ADV_TDS.1	Basic design
Guidance Documents	AGD_OPE.1	Operational user guidance
	AGD_PRE.1	Preparative procedures
Life-Cycle Support	ALC_CMC.2	Use of a CM system
	ALC_CMS.2	Parts of the TOE CM coverage
	ALC_DEL.1	Delivery procedures
	ALC_FLR.1	Basic flaw remediation
Tests	ATE_COV.1	Evidence of coverage
	ATE_FUN.1	Functional testing
	ATE_IND.2	Independent testing - sample
Vulnerability Assessment	AVA_VAN.2	Vulnerability analysis

6.3 CC Component Hierarchies and Dependencies

This section of the ST demonstrates that the identified SFRs include the appropriate hierarchy and dependencies. The following table lists the TOE SFRs and the SFRs each are hierarchical to, dependent upon and any necessary rationale.

Table 15 - TOE SFR Dependency Rationale

SFR	Hierarchical To	Dependency	Rationale
FDP_IFC.1	No other components.	FDP_IFF.1	Satisfied
FDP_IFF.1	No other components.	FDP_IFC.1, FMT_MSA.3	Satisfied Not satisfied. This SFR is not required since the attributes are dynamically determined by the TOE
FIA_AFL.1	No other components.	FIA_UAU.1	Satisfied by FIA_UAU.2
FIA_ATD.1	No other components.	None	na
FIA_SOS.1	No other components.	None	na
FIA_UAU.2	FIA_UAU.1	FIA_UID.1	Satisfied by FIA_UID.2
FIA_UAU.7	No other components.	FIA_UAU.1	Satisfied by FIA_UAU.2
FIA_UID.2	FIA_UID.1	None	na
FIA_USB.1	No other components.	FIA_ATD.1	Satisfied
FMT_MOF.1	No other components.	FMT_SMF.1, FMT_SMR.1	Satisfied Satisfied
FMT_MTD.1	No other components.	FMT_SMF.1, FMT_SMR.1	Satisfied Satisfied
FMT_SMF.1	No other components.	None	na
FMT_SMR.1	No other components.	FIA_UID.1	Satisfied by FIA_UID.2
FPT_STM.1	No other components.	None	na
IDS_SDC.1	No other components.	FPT_STM.1	Satisfied

SFR	Hierarchical To	Dependency	Rationale
IDS_ANL.1	No other components.	FPT_STM.1 IDS_SDC.1	Satisfied Satisfied
IDS_RCT.1	No other components.	IDS_ANL.1	Satisfied
IDS_RDR.1	No other components.	IDS_SDC.1, IDS_ANL.1	Satisfied Satisfied
IDS_STG.1	No other components.	IDS_SDC.1, IDS_ANL.1	Satisfied Satisfied

7. TOE Summary Specification

7.1 Identification and Authentication

The TOE performs I&A for all administrative access to the CM before granting any other access.

When I&A is required, the user must enter a userid and password. As the password is entered, dots are echoed back. When the credentials are submitted, the TOE verifies them against its store of defined accounts. If the credentials are not valid, the user is notified via a text message and is again prompted for credentials. If 4 consecutive failed login attempts occur for a configured account, the account is automatically locked for 15 minutes. When valid credentials are entered, the user attributes are bound to the session so that appropriate privileges may be enforced. The TOE supports multiple simultaneous management sessions and tracks the attributes for each session individually.

During a session the attributes do not change. If an administrator modifies the attributes for a session while the corresponding user has an active session, those changes do not take effect until that user logs out and logs back in.

7.2 Management

The TOE provides management capability to enable the TOE to be controlled and monitored. The user roles provide different privileges to accommodate different user roles in an operational environment. The specific privileges for management functions associated with each role are defined in the tables following FMT_MOF.1 and FMT_MTD.1.

Note that the Provisioner role is intended to be used to manage credentials for authentication to the TOE of users on managed devices. Since this functionality is excluded from the evaluation, the Provisioner role does not serve any practical purpose.

A single web-based management interface is provided on CM.

When an administrator configures a password for an account, password construction rules as defined in FIA_SOS.1 are enforced. When an existing account is viewed, only dots are displayed.

7.3 Network Access Control

The TOE monitors all network traffic on each managed segment. The monitoring is performed in order to:

1. Detect new managed devices communicating on a managed segment.
2. Detect suspicious network behavior (statistical and signature analysis) by devices as defined by administrators via the profiles that are associated with active Access Zones. Suspicious behaviors may be specified to detect an excessive number of devices being contacted by a managed device, an excessive number of ports being contacted by a managed device, or managed devices sending IP datagrams matching templates defined by an administrator.

If configured by an administrator, the TOE performs scanning of the devices to determine characteristics about them (integrity analysis). Scanning may consist of one or both of:

1. Examination of the network packets returned from a device in response to probe packets sent by the TOE. The probe packets are specially constructed to elicit responses indicative of specific operating systems or network functions (e.g. wireless devices).
2. Determination of detailed device configuration information via a Java applet downloaded to a device via a browser session. This form of scanning is initiated by a Sensor redirecting an HTTP session initiated from a managed device to the Portal.

The information learned about each device is analyzed to determine which of the configured profiles match that device’s characteristics. Changes to profile matches cause analytical result events to be generated and saved. All system data records include a time stamp. Alerts may be sent to SMTP servers, SNMP managers, or syslog servers based upon entry to or exit from the matching profiles. Each device is then assigned to an Access Zone based upon analysis of the matching profiles and the profiles defined for the Access Zones. Only Access Zones that are active are considered during this process. Changes to Access Zone membership cause analytical result events to be generated and saved. All system data records include a time stamp. Access Zones may be configured to generate alerts to SMTP servers, SNMP managers, or syslog servers based upon entry to or exit from the Access Zone.

If network traffic is restricted for a managed device (as specified by the Access Zone membership), the TOE sends ARP messages to cause that managed device to send all its network traffic to the attached sensor rather than directly to the intended recipient. Any device on the managed segment that communicates with that managed device is directed to send network traffic for the managed device to the attached sensor rather than sending it directly to the managed device. The TOE uses a special range of MAC addresses (00:9c:xx:xx:xx:xx) to identify traffic to or from managed devices with restrictions. The sensor then enforces the network traffic restrictions.

Each Access Zone defines the network usage policies for managed devices that belong to it based upon the associated profiles and device attributes. The Access Zone then specifies the allowed types of network traffic for the devices in that Access Zone. Administrators may configure an Access Zone to restrict network traffic via the following methods:

1. Specified contents of IP datagrams may be explicitly allowed or denied.
2. For HTTP sessions, redirect the session to a configured server (e.g., a remediation server in the operational environment to resolve an issue with operating system patches or device configuration). This functionality can be used to redirect HTTP sessions to an ACP for download of the Java applet to perform scanning of the managed device, or to collect credentials for validation against a credential store in the operational environment.
3. For HTTP sessions, a text message may be returned to the device. The text message may include an embedded URL, which can be clicked on by users of a managed device to initiate an HTTP session to an ACP for download of the Java applet to perform scanning of the device, or to collect credentials for validation against a credential store in the operational environment.

All of these methods apply to IP datagrams sent from a managed device with network traffic restrictions. Only the first method (IP datagram content matching) applies to IP datagrams sent to a managed device with network traffic restrictions.

Upon command by an administrator, the matching profiles for a managed device are re-analyzed and the Access Zone membership may change. Managed devices may be forced into a specific Access Zone by administrators or operators. Once forced into a zone, the managed device remains in that Access Zone until the forced condition is removed.

The TOE generates and stores system data analytical result records. All system data records include a time stamp. System data analytical result records are saved for 30 days then deleted. No mechanism is provided for administrators to modify or delete the records.

The administrator, operator and observer roles may retrieve system data analytical results for events using views or reports in CM.

If storage space for system data analytical result records is exhausted, new information is ignored.

8. Protection Profile Claims

This chapter provides detailed information in reference to the Protection Profile conformance identification that appears in Chapter 2.

8.1 Protection Profile Reference

This Security Target does not claim conformance to any registered Protection Profile.

8.2 Protection Profile Refinements

This Security Target does not claim conformance to any registered Protection Profile.

8.3 Protection Profile Additions

This Security Target does not claim conformance to any registered Protection Profile.

8.4 Protection Profile Rationale

This Security Target does not claim conformance to any registered Protection Profile.

9. Rationale

This chapter provides the rationale for the selection of the IT security requirements, objectives, assumptions and threats. It shows that the IT security requirements are suitable to meet the security objectives, Security Requirements, and TOE security functional.

9.1 Rationale for IT Security Objectives

This section of the ST demonstrates that the identified security objectives are covering all aspects of the security needs. This includes showing that each threat and assumption is addressed by a security objective.

The following table identifies for each threat and assumption, the security objective(s) that address it.

Table 16 - Threats and Assumptions to Security Objectives Mapping

	O.DETECT_DEVICES	O.I&A	O.IDANLZ	O.IDSCAN	O.IDSENS	O.MANAGE	O.RESTRICT_DEVICES	O.TIME_STAMP	O.TOE_ACCESS	OE.ARP	OE.COMM	OE.ENVIRON	OE.INSTALL	OE.MIRROR	OE.NETWORK	OE.NOEVILADMIN
T.MASQUERADE		X							X		X					
T.UNAUTH_ACCESS			X	X	X		X	X		X				X		
T.UNAUTH_CONFIG			X	X			X	X		X						
T.UNAUTH_DEVICES	X		X	X	X		X	X		X				X		
A.ARP										X						
A.ENVIRON												X				
A.INSTALL													X			
A.NETWORK															X	
A.NOEVILADMIN																X
P.MANAGE						X										

9.1.1 Rationale Showing Threats to Security Objectives

The following table describes the rationale for the threat to security objectives mapping.

Table 17 - Threats to Security Objectives Rationale

T.TYPE	Security Objectives Rationale
T.MASQUERADE	**O.TOE_ACCESS** mitigates this threat by controlling the logical access to the TOE and its resources. By constraining how authorized users can access the TOE, this objective helps mitigate the possibility of a user attempting to login and masquerade as an authorized user. **O.I&A** is necessary so that each administrator is properly identified and appropriate privileges may be enforced for each. **OE.COMM** is necessary to protect the intra-TOE communication.
T.UNAUTH_ACCESS	**O.RESTRICT_DEVICES** mitigates this threat by requiring the TOE to be able to restrict network access for devices that attempt unauthorized access. **O.IDSENS** supports the first objective by requiring the TOE to be able to detect devices as they become active on the network and monitor their access. **O.IDSCAN** supports the first objective by requiring the TOE to be able to learn attributes about devices so that appropriate access permissions may be determined. **O.IDANLZ** supports the first objective by requiring the TOE to analyze the information learned about devices to determine the access permissions appropriate for the device. **O.TIME_STAMP** supports **O.IDSENS**, **O.IDSCAN** and **O.IDANLZ** by ensuring an accurate time stamp is available for system data records. **OE.ARP** supports the first objective by requiring all devices to properly process ARP messages. The TOE uses ARP messages to implement the network access restrictions. **OE.MIRROR** supports the first objective by requiring the network equipment in the operational environment to be able to provide a copy of the network traffic to the TOE so that the TOE is able to monitor the traffic.
T.UNAUTH_CONFIG	**O.RESTRICT_DEVICES** mitigates this threat by requiring the TOE to be able to restrict network access for devices that violate configuration policies. **O.IDSCAN** supports the first objective by requiring the TOE to be able to learn attributes about devices so that appropriate access permissions may be determined. **O.IDANLZ** supports the first objective by requiring the TOE to analyze the information learned about devices to determine the access permissions appropriate for the device. **O.TIME_STAMP** supports **O.IDSCAN** and **O.IDANLZ** by ensuring an accurate time stamp is available for system data records. **OE.ARP** supports the first objective by requiring all devices to properly process ARP messages. The TOE uses ARP messages to implement the network access restrictions.

T.TYPE	Security Objectives Rationale
T.UNAUTH_DEVICES	**O.DETECT_DEVICES** mitigates this threat by requiring the TOE to be able to detect devices on managed segments. **O.RESTRICT_DEVICES** mitigates this threat by requiring the TOE to be able to restrict network access for unauthorized devices. **O.IDSENS** supports the first objective by requiring the TOE to be able to monitor device access on managed segments. **O.IDSCAN** supports the first objective by requiring the TOE to be able to learn attributes about devices so that appropriate access permissions may be determined. **O.IDANLZ** supports the first objective by requiring the TOE to analyze the information learned about devices to determine the access permissions appropriate for the device. **O.TIME_STAMP** supports **O.IDSENS**, **O.IDSCAN** and **O.IDANLZ** by ensuring an accurate time stamp is available for system data records. **OE.ARP** supports the first objective by requiring all devices to properly process ARP messages. The TOE uses ARP messages to implement the network access restrictions. **OE.MIRROR** supports the first objective by requiring the network equipment in the operational environment to be able to provide a copy of the network traffic to the TOE so that the TOE is able to monitor the traffic.

9.1.2 Rationale Showing Assumptions to Environment Security Objectives

The following table describes the rationale for the assumption to security objectives mapping.

Table 18 - Assumptions to Security Objectives Rationale

A.TYPE	Environment Security Objective Rationale
A.ARP	**OE.ARP** addresses this assumption by requiring managed devices to properly process ARP messages.
A.ENVIRON	**OE.ENVIRON** addresses this assumption by restating it as an objective for the Administrator to satisfy.
A.INSTALL	**OE.INSTALL** addresses this assumption by restating it as an objective for the Administrator to satisfy.
A.NETWORK	**OE.NETWORK** addresses this assumption by restating it as an objective for the Administrator to satisfy.
A.NOEVILADMIN	**OE.NOEVILADMIN** addresses this assumption by restating it as an objective for the Administrator to satisfy.

9.1.3 Rationale Showing OSPs to Security Objectives

The following table describes the rationale for the OSPs to security objectives mapping.

Table 19 - OSPs to Security Objectives Rationale

P.TYPE	Security Objectives Rationale
P.MANAGE	**O.MANAGE** addresses this OSP by requiring the TOE to provide administrators with functions and facilities to effectively manage the TOE.

9.2 Security Requirements Rationale

9.2.1 Rationale for Security Functional Requirements of the TOE Objectives

This section provides rationale for the Security Functional Requirements demonstrating that the SFRs are suitable to address the security objectives.

The following table identifies for each TOE security objective, the SFR(s) that address it.

Table 20 - SFRs to Security Objectives Mapping

	O.DETECT_DEVICES	O.I&A	O.IDANLZ	O.IDSCAN	O.IDSENS	O.MANAGE	O.RESTRICT_DEVICES	O.TIME_STAMP	O.TOE_ACCESS
FDP_IFC.1							X		
FDP_IFF.1							X		
FIA_AFL.1		X							
FIA_ATD.1		X							
FIA_SOS.1						X			X
FIA_UAU.2		X							
FIA_UAU.7		X							
FIA_UID.2		X							
FIA_USB.1		X							X
FMT_MOF.1						X			X
FMT_MTD.1						X			X
FMT_SMF.1						X			X
FMT_SMR.1						X			X
FPT_STM.1								X	
IDS_SDC.1	X			X	X				
IDS_ANL.1			X						
IDS_RCT.1							X		
IDS_RDR.1							X		
IDS_STG.1							X		

The following table provides the detail of TOE security objective(s).

Table 21 - Security Objectives to SFR Rationale

Security Objective	SFR and Rationale
O.DETECT_DEVICES	**IDS_SDC.1** addresses the objective by requiring the TOE to detect devices using the network.

Security Objective	SFR and Rationale
O.I&A	**FIA_UID.2** and **FIA_UAU.2** address the objective by requiring the TOE to successfully identify and authenticate administrators before granting them access to any management functionality. **FIA_AFL.1** supports the objective by introducing delays against brute force attacks. **FIA_ATD.1** supports the objective by defining the attributes that are associated with each authorized account. **FIA_UAU.7** supports the objective by requiring password entry to be protected from disclosure. **FIA_USB.1** supports the objective by defining the attributes that are associated with a user session when I&A is successful and requiring that those attributes do not change during the session.
O.IDANLZ	**IDS_ANL.1** addresses the objective by requiring the TOE to analyze the information learned about manage devices to determine the Access Zone membership and save result records.
O.IDSCAN	**IDS_SDC.1** addresses the objective by requiring the TOE to learn information about the configuration of managed devices to use in the analysis function.
O.IDSENS	**IDS_SDC.1** addresses the objective by requiring the TOE to monitor network traffic for managed devices to learn information about them and detect suspicious behavior.
O.MANAGE	**FMT_MOF.1** addresses the objective by defining the security functions and operations that are available to and authorized for each of the defined roles. **FMT_MTD.1** addresses the objective by defining the available and authorized TSF data access for each of the defined roles. **FMT_SMF.1** supports the objective by defining the security functions available to authorized administrators. **FMT_SMR.1** supports the objective by defining the set of roles supported by the TOE. **FIA_SOS.1** supports the objective by defining the rules for passwords specified for accounts by authorized administrators.
O.RESTRICT_DEVICES	**FDP_IFC.1** and **FDP_IFF.1** address the objective by requiring the TOE to be able to restrict the network access of managed devices per the service restrictions configured in Access Zones. **IDS_RCT.1** supports the objective by requiring the TOE to • generate alarms per the Access Zone configurations so that administrators are informed about managed devices that violate configured policies • enforce the service restrictions configured in Access Zones **IDS_RDR.1** supports the objective by providing administrators with information about the devices on the network, their configuration, and their behavior. **IDS_STG.1** supports the objective by ensuring the information administrators need is not deleted or modified, and by defining the retention policy when storage space is exhausted.
O.TIME_STAMP	**FPT_STM.1** addresses the objective by requiring the TOE to provide reliable time stamps for system data records.

Security Objective	SFR and Rationale
O.TOE_ACCESS	**FMT_MOF.1** addresses the objective by defining the security functions and operations that are authorized for each of the defined roles. **FMT_MTD.1** addresses the objective by defining the authorized TSF data access for each of the defined roles. **FMT_SMF.1** supports the objective by defining the security functions available to authorized administrators. **FMT_SMR.1** supports the objective by defining the set of roles supported by the TOE. **FIA_SOS.1** supports the objective by defining the rules for passwords specified for accounts by authorized administrators. **FIA_USB.1** supports the objective by defining the attributes that are associated with a user session when I&A is successful so that appropriate privileges may be enforced.

9.2.2 Security Assurance Requirements Rationale

The TOE stresses assurance through vendor actions that are within the bounds of current best commercial practice. The TOE provides, primarily via review of vendor-supplied evidence, independent confirmation that these actions have been competently performed.

The general level of assurance for the TOE is:

A) Consistent with current best commercial practice for IT development and provides a product that is competitive against non-evaluated products with respect to functionality, performance, cost, and time-to-market.

B) The TOE assurance also meets current constraints on widespread acceptance, by expressing its claims against EAL2 augmented by ALC_FLR.1 from part 3 of the Common Criteria.

9.3 TOE Summary Specification Rationale

This section demonstrates that the TOE's Security Functions completely and accurately meet the TOE SFRs.

The following tables provide a mapping between the TOE's Security Functions and the SFRs and the rationale.

Table 22 - SFRs to TOE Security Functions Mapping

	I&A	Management	Network Access Control
FDP_IFC.1			X
FDP_IFF.1			X
FIA_AFL.1	X		
FIA_ATD.1	X		
FIA_SOS.1		X	
FIA_UAU.2	X		
FIA_UAU.7	X		

	I&A	Management	Network Access Control
FIA_UID.2	X		
FIA_USB.1	X		
FMT_MOF.1		X	
FMT_MTD.1		X	
FMT_SMF.1		X	
FMT_SMR.1		X	
FPT_STM.1			X
IDS_SDC.1			X
IDS_ANL.1			X
IDS_RCT.1			X
IDS_RDR.1			X
IDS_STG.1			X

Table 23 - SFR to SF Rationale

SFR	SF and Rationale
FDP_IFC.1	**Network Access Control** – As configured by an administrator for specific Access Zones, the TOE may forward network traffic, discard network traffic, redirect HTTP sessions, or return a text message for HTTP sessions.
FDP_IFF.1	**Network Access Control** – As configured by an administrator for specific Access Zones, the TOE may forward network traffic, discard network traffic, redirect HTTP sessions, or return a text message for HTTP sessions.
FIA_ATD.1	**I&A** – The TOE automatically locks accounts for 20 minutes upon 4 consecutive failed login attempts.
FIA_ATD.1	**I&A** – The TOE manages a set of attributes for each defined account.
FIA_SOS.1	**Management** – When a password is configured for an account, the TOE enforces password policies.
FIA_UAU.2	**I&A** – The TOE requires each user to successfully authenticate before access is granted to any management functions.
FIA_UAU.7	**I&A** – When a password is entered, only dots are echoed back to the user.
FIA_UID.2	**I&A** - The TOE requires each user to successfully identify him/herself before access is granted to any management functions.
FIA_USB.1	**I&A** – Upon successful I&A, attributes are bound to the session for the duration of the session.
FMT_MOF.1	**Management** – The privileges for management functions for each role are clearly defined and enforced by the TOE.
FMT_MTD.1	**Management** - The access privileges to TSF data for each role are clearly defined and enforced by the TOE.
FMT_SMF.1	**Management** – The set of management functions are provided by the CM interface.
FMT_SMR.1	**Management** – The set of roles for management access is clearly defined and enforced by the TOE.
FPT_STM.1	**Network Access Control** – The TOE inserts a time stamp into each system data record generated.

SFR	SF and Rationale
IDS_SDC.1	**Network Access Control –** The TOE monitors network traffic to detect new devices, detect network behaviour that violates configured usage policies, and determine information about devices. The TOE also scans managed devices to learn more detailed information about them.
IDS_ANL.1	**Network Access Control –** The TOE analyzes information learned about devices to determine matching profiles, which are in turn used to determine Access Zone membership.
IDS_RCT.1	**Network Access Control –** As configured by an administrator for specific Access Zones or profiles, the TOE may generate an alarm and/or restrict network traffic.
IDS_RDR.1	**Network Access Control –** System data analytical result records may be reviewed by administrators, operators or observers for events within their domain or subordinate sub-domains.
IDS_STG.1	**Network Access Control –** The TOE does not provide any mechanism for users to modify or delete System data analytical result records.

9.4 PP Claims Rationale

The rationale for the Protection Profile conformance claims is defined in Chapter 8.