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Interface to Network Security Functions (I2NSF) Terminology
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Abstract

This document defines a set of terms that are used for the Interface to Network Security Functions (I2NSF) effort.

Status of This Memo

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This Internet-Draft will expire on October 6, 2016.

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1. Introduction

This document defines the terminology for the Interface to Network Security Functions(I2NSF) effort. This section provides some background on I2NSF; a detailed problem statement can be found in [I-D.ietf-i2nsf-problem-and-use-cases]

Enterprises are now considering using network security functions (NSFs) hosted by service providers due to the growing challenges and complexity in maintaining an up to date secure infrastructure that complies with regulatory requirements, while controlling costs. The hosted security service is especially attractive to small and medium size enterprises who suffer from a lack of security experts to continuously monitor, acquire new skills and propose immediate mitigations to ever increasing sets of security attacks. Small and medium-sized businesses (SMBs) are increasingly adopting cloud-based security services to replace on-premises security tools, while larger enterprises are deploying a mix of traditional (hosted) and cloud-based security services.

To meet the demand, more and more service providers are providing hosted security solutions to deliver cost-effective managed security services to enterprise customers. The hosted security services are primarily targeted at enterprises, but could also be provided to any kind of mass-market customers as well. NSFs are provided and consumed in increasingly diverse environments. Users of NSFs may consume network security services hosted by one or more providers, which may be their own enterprise, service providers, or a combination of both.

It is out of scope in this document to define an exhaustive list of terms that are used in the security field; the reader is referred to other applicable documents, such as [RFC4949].

2. Terminology

AAA: Authentication, Authorization, and Accounting. See individual definitions.

Abstraction: The definition of the salient characteristics and behavior of an object that distinguish it from all other types of objects. It manages complexity by exposing common properties between objects and processes while hiding detail that is not relevant.

Access Control: Protection of system resources against unauthorized access; a process by which use of system resources is regulated according to a security policy, and is permitted by only authorized entities (users, programs, processes, or other systems) according to that policy [RFC4949].

Accounting: The act of collecting information on resource usage for the purpose of trend analysis, auditing, billing, or cost allocation ([RFC2975] [RFC3539]

ACL (Acess Control List): This is a mechanism that implements access control for a system resource by enumerating the system entities that are permitted to access the resource and stating, either implicitly or explicitly, the access modes granted to each entity [RFC4949].

Action: Defines what is to be done when a set of conditions are met (See I2NSF Action). (from [I-D.strassner-supa-generic-policy-info-model])

Authentication: The act of verifying a claimed identity, in the form of a pre-existing label from a mutually known name space, as the originator of a message (message authentication) or as the end-point of a channel (entity authentication) [RFC3539].

Authorization: The act of determining if a particular right, such as access to some resource, can be granted to the presenter of a particular credential [RFC3539].

B2B: Business-to-Business.

Bespoke: Something made to fit a particular person, customer, or company.

Bespoke security management: Security management systems that are make to fit a particular customer.

Boolean Clause: A logical statement that evaluates to either TRUE or FALSE. Also called Boolean Expression.

Capability: Defines a set of features that are available from a managed entity (see also I2NSF Capability).

Capability Layer: Defines an abstraction layer that exposes a set of capabilities of the I2NSF system.

Condition: A set of attributes, features, and/or values that are to be compared with a set of known attributes, features, and/or values in order to make a decision. A Condition, when used in the context of a Policy Rule, is used to determine whether or not the set of Actions in that Policy Rule can be executed or not. Examples of an I2NSF Condition include matching attributes of a packet or flow, and comparing the internal state of a NSF to a desired state. [I-D.strassner-supa-generic-policy-info-model]

Constraint: A constraint is a limitation or restriction. Constraints may be associated with any type of object (e.g., events, conditions, and actions in Policy Rules).

Constraint Programming: A type of programming that uses constraints to define relations between variables in order to find a feasible (and not necessarily optimal) solution.

Context: The Context of an Entity is a collection of measured and/or inferred knowledge that describe the state and the environment in which an Entity exists or has existed. (from http://www.ietf.org/mail-archive/web/i2nsf/current/msg00762.html)

Controller: TBD [Editorial: The definition is lacking content ("used interchangeably with Service Provider Security Controller or management system throughout this document") and overloaded - the two terms should be split into two separate definitions in documents.]

Customer: A business role of an entity that is involved in the definition and/or consumption of services, and the possible negotiation of a contract to use services from a Provider.

DC: Data Center

Data Model: A representation of concepts of interest to an environment in a form that is dependent on data repository, data definition language, query language, implementation language, and protocol (typically one or more of these) [I-D.strassner-supa-generic-policy-info-model].

Event: An important occurrence in time of a change in the system being managed, and/or in the environment of the system being managed. Examples of an I2NSF Event include time and user actions (e.g. logon, logoff, and actions that violate an ACL). An Event, when used in the context of a Policy Rule, is used to determine whether the condition clause of an imperative Policy Rule can be evaluated or not [I-D.strassner-supa-generic-policy-info-model].

ECA: Event - Condition - Action policy (a type of Policy Rule).

Firewall (FW): A function that restricts data communication traffic to and from one of the connected networks (the one said to be ’inside’ the firewall), and thus protects that network’s system resources against threats from the other network (the one that is said to be ’outside’ the firewall) [RFC4949]. [I-D.ietf-opsawg-firewalls]

Flow-based NSF: A NSF that inspects network flows according to a set of policies intended for enforcing security properties. Flow-based security also means that packets are inspected in the order they are received, and without modification to the packet due to the inspection process.

I2NSF Action: An I2NSF Action is a special type of Action that is used to control and monitor aspects of flow-based Network Security Functions. Examples of I2NSF Actions include providing intrusion detection and/or protection, web and flow filtering, and deep packet inspection for packets and flows. An I2NSF Action, when used in the context of a I2NSF Policy Rule, may be executed when both the event and the condition clauses of its owning I2NSF Policy Rule evaluate to true. The execution of this action may be influenced by applicable metadata [I-D.strassner-supa-generic-policy-info-model].

I2NSF Agent: A software component in a device that implements an NSF. It receives provisioning information and requests for operational data (e.g., monitoring data) from an I2NSF client. It is also responsible for enforcing the policies that it receives from an I2NSF client.

I2NSF Capability: A set of features that are available from an NSF server.

I2NSF client: A software component that uses the I2NSF framework to read, write, and/or change provisioning and operational aspects of the NSFs that it attaches to.

I2NSF Management System: I2NSF clients operate within a network management system, which serves as a collection and distribution point for I2NSF security provisioning and filters data.

I2NSF Policy: A set of rules that are used to manage and control the changing or maintaining of the state of an NSF instance.

I2NSF Policy Rule: A policy rule that is adapted for I2NSF usage. The I2NSF Policy Rule is assumed to be in ECA form (i.e., an imperative structure). Other types of programming paradigms (e.g., declarative and functional) are currently out of scope. An example of an I2NSF Policy Rule is, in pseudo-code:

```
IF <event-clause> is TRUE

   IF <condition-clause> is TRUE

      THEN execute <action-clause>

   END-IF

END-IF
```

In the above example, the Event, Condition, and Action portions of a Policy Rule are all **Boolean Clauses**.

I2NSF Registry: A registry that contains I2NSF capability information, which can be controlled by the I2NSF Management System.

IDS: Intrusion Detection System (see below).

IPS: Intrusion Protection System (see below).

Information Model: Is a representation of concepts of interest to an environment in a form that is independent of data repository, data definition language, query language, implementation language, and protocol [I-D.strassner-supa-generic-policy-info-model].

Interface: A set of operations one object knows it can invoke on, and expose to, another object. It is a subset of all operations that a given object implements. The same object may have multiple types of interfaces to serve different purposes. An example of multiple interfaces can be seen by considering the interfaces include a firewall uses; these include:

* multiple interfaces for data packets to traverse through,

* an interface for a controller to impose policy,or retrieve the results of execution of a policy rule.

Intrusion Detection System (IDS): A system that detects network intrusions via a variety of filters, monitors, and/or probes. An IDS may be stateful or stateless.

Intrusion Protection System (IPS): A system that protects against network intrusions. An IPS may be stateful or stateless.

Metadata: Data that provides information about other data. Examples include IETF network management protocols (e.g. NETCONF, RESTCONF, IPFix) or IETF routing interfaces (I2RS). The I2NSF security interface may utilize Metadata to describe and/or prescribe characteristics and behavior of the YANG data models.

Middlebox: Any intermediary device performing functions other than the normal, standard functions of an IP router on the datagram path between a source host and destination host [RFC3234].

Network Security Function (NSF): Software that provides a set of security-related services. Examples include detecting unwanted activity and blocking or mitigating the effect of such unwanted activity in order to fulfil service requirements. The NSF can also help in supporting communication stream integrity and confidentiality.

OCL (Object Constraint Language): A constraint programming language that is used to specify constraints (e.g., in UML) (from http://www.ietf.org/mail-archive/web/i2nsf/current/msg00762.html)

Policy Rule: A set of rules that are used to manage and control the changing or maintaining of the state of one or more managed objects. Often this is shorterned to Rule or Policy (see I2NSF policy rule) [I-D.strassner-supa-generic-policy-info-model].

Profile: A structured representation of information that characterizes the capabilities of an object, typically in a specific context. This may be used to simplify how this object interacts with other objects in its environment. [Editors note: John Strassner suggests this is a simplified definition from a variety of sources (UAProf and CC/PP). It does not mention the concept of preference, therefore John wonders if we need a different definition here.]

Registry: is a logically centralized location containing data of a particular type; it may optionally contain metadata,

relationships, and other aspects of the registered data in order to use those data effectively. An I2NSF registry is used to contain capability information that can be controlled by the controller.

Registration Interface: An interface dedicated to requesting, receiving, editing, and deleting information in a Registry.

Service Layer: Software that enables clients to manage security policies for their specific flows. This is also called the Client-Facing Interface.

Service Provider Security Controller: TBD (Editorial: Place holder for a split between controller and security controller definitions.)

Tenant: A group of users that share common access privileges to the same software. An I2NSF tenant may be physical or virtual, and may run on a variety of systems or servers.

Vendor Facing Interface: This enables vendors to register their NSFs, along with the capabilities of their NSFs, with a logically centralized authority.

Virtual NSF: An NSF that is deployed as a distributed virtual device.

Virtual Network Function (VNF): A virtualized network component, such as a router, switch, security box, or AAA Servier.

VNFM (VNF Manager): Manager of virtual network functions that creates, deletes, manages, and moves VNFs.

VNFPool: A collection of interchangeable VNFs (i.e., each VNF has the same set of capabilities).

Virtualization: Virtualization is a type of software that creates a non-physical version of an object. Examples include virtualized operating systems, storagte devices, and networking elements. [Editor’s notes: Questions from John: Do we want or need to differentiate between different tyeps of virtualization? For example: full vs. partial vs. para-virtualization (all types of "hardware virtualization")? Do we need to introduce OS virtualization? What about application virtualization?]

3. IANA Considerations

No IANA considerations exist for this document.

4. Security Considerations

This is a terminology document with no security considerations.

5. References

5.1. Normative References

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