
Technical Document

Configuring SolarWinds NMS for SNMPv3 communications with NuDesign SNMPv3 Agent Service

NuDesign Technologies, Inc.

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Document History

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Introduction

This document explains how to set up SNMPv3 credentials on Orion SolarWinds products for communications with NuDesign SNMPv3 Agent Service.

Configuration

Orion requires 2 SNMPv3 users, one for Read-only access (section labelled "SNMPv3 Credentials"), and one for Read-write access (section labelled "Read/Write SNMPv3 Credentials") .

SNMP Info

SNMP Version: SNMPv3 is a secure version of the SNMP protocol, adding authentication and encryption. SNMPv3 may require configuration on your network devices. Orion NPM can store SNMPv3 credential sets in the Orion database.

SNMP Port:

Allow 64 bit counters

SNMPv3 Credentials

SNMPv3 Username:

SNMPv3 Context:

SNMPv3 Authentication

Method:

Password / Key:

SNMPv3 Privacy / Encryption

Method:

Password / Key:

Credential Set Library

Name:

Saved Credential Sets

Read / Write SNMPv3 Credentials

SNMPv3 Username:

SNMPv3 Context:

SNMPv3 Authentication

Method:

Password / Key:

SNMPv3 Privacy / Encryption

Method:

Password / Key:

Credential Set Library

Name:

Saved Credential Sets

The example NMS configuration is based on default configuration of NuDesign SNMPv3 Agent Service.

NuDesign agent ships with the following preconfigured USM users:

Name	Authentication		Privacy	
	Protocol	Password	Protocol	Password
public	none		none	
md5	MD5	md5auth	none	
md5nopriv	MD5	md5noprivauth	none	
sha	SHA	shaauth	none	
shanopriv	SHA	shanoprivauth	none	
md5des	MD5	md5desauth	DES	md5despriv
shades	SHA	shadesauth	DES	shadespriv
md5aes	MD5	md5aesauth	AES	md5aespriv
shaaes	SHA	shaaesauth	AES	shaaespriv

User "public" is "read-only" user (it is mapped to "grpReadOnly" in VacmSecurityToGroupTable. Other users are "read-write" (mapped to "grpAll").

SNMPv3 Credentials:

```
SNMPv3 Username: public
SNMPv3 Context:
SNMPv3 Authentication
  Method: None
  Password | Key:
SNMPv3 Privacy/Encryption
  Method: None
  Password | Key:
```

Read/Write SNMPv3 Credentials:

```
SNMPv3 Username: shaaes
SNMPv3 Context:
SNMPv3 Authentication
  Method: SHA
  Password | Key: shaaesauth
SNMPv3 Privacy/Encryption
  Method: AES128
  Password | Key: shaaespriv
```

Context is zero length string, i.e. leave SNMPv3 Context field empty.

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Click "Validate SNMP", SolarWinds sends SNMPv3 Get request (using "read-only" credentials) and SNMPv3 Set request (using "read-write" credentials). Both requests must succeed in order for Validate to report success.

A Little Background on SNMPv3

Sending SNMPv3 requestst (Get, Set, GetNext, GetBulk) cause multiple packets to be exchanged between manager (Orion) and agent (NuDesign agent service). Namely, SNMPv3 has concept of aauthoritative entity in each exchange. In this case agent is authoritative entity. Manager has to specify "authoritative engineid" (i.e. engineid of authoritative entity) in each request, so the sequence of exchange for Get request looks like

M1: sends discovery Get request (engineid is empty field)
A1: sends Report back, this report contains agent's engine id
M2: uses agent's engine id from received report, and sends Get request
A2: sends Response to manager

Step A2 may contain proper response (value requested), but may also contain error indication, e.g. noSuchObject (agent does not implement requested MIB object), noSuchInstance (agent does implement requested MIB object but not requested instance), endOfMib (this only in case of GetNext request). A2 can be Report as well: unknownEngineid (manager specified engineid that does not match agent's engineid), unknownUserName (user name specified in request is unknown to the agent), etc.

When USM user to be used in request is configured to use authentication (MD5 or SHA) or authentication and privacy (MD5/DES, MD5/AES128, SAH/DES, SHA/AES128), tne manager must include agent's time and boot count in the request (TIMELINES mechanism). Sequence of exchanges in this case look like

M1: sends discovery Get request (engineid is empty field)
A1: sends unknownEngineid Report back, this report contains agent's engine id
M2: uses agent's engineid from received report, and sends Get request with time=0, boot=0
A2: sends notInTimeWindow Report to manager, this report contains agent's boot and time
M3: uses agent's engineid, boot and time from received reports, and sends Get request
A3: sends Response to manager

Again, A3 may be response containing value of requested object, or error response, or report.

SNMPv3 is specified in RFC 3411 to RFC 3415.

About NuDesign Technologies

NuDesign provides software tools, libraries and applications for development of management agents and client applications used in remote configuration, monitoring and control of network devices, services, and applications. Our solutions operate over IPv4 / IPv6 networks in carrier, campus and enterprise settings. We also provide professional services supporting customers requiring specific management application and agent solutions.

Our software is based on industry standard management protocols such as NETCONF, SNMP, CLI, Web and RESTCONF protocols. Our customers are Original Equipment Manufacturers, System Integrators, Operators, Service Providers and End Users worldwide.

Our development products and software technologies provide the basis for the following solutions:

- the management Agents for embedded targets, implementing standard and custom YANG / MIB data models with secure, well integrated NETCONF / SNMPv3 / CLI and / or Web & RESTCONF access.
- the secure SNMPv3 and CLI management solutions for multiple desktop and embedded targets.
- the secure monitoring of Windows and Linux Servers using extensible SNMPv3 Agent Service for Windows or Linux with standard and / or custom extension subagents, configured with the provided SNMPv3 Configuration Editor. NuDesign SNMPv3 Service for Windows is a direct, drop-in replacement of Microsoft Windows SNMP Service (please visit www.snmp4windows.com).
- the SNMP Browser, MIB Builder and Traffic Monitor products that are feature rich, extensible, and easy to use in development, test and production environments.
- specialized SNMPv3 Management Agents and Managers for avionics AFDX® / ARINC664 networks and SNMPv1 products for NTCIP Transportation industry.

The highly automated management Agent / Subagent / Manager development tools, code generation wizards, multiple target development libraries, samples, evaluations with associated tutorials and our technical support enable quick learning, fast prototyping, experimentation, development and reliable production deployment.

The code generation tools facilitate organization of design process, providing for generation of project files for target OS / RTOS and a very complete and immediately compilable agent or manager source code.

For more information please visit www.ndt-inc.com, it contains NETCONF, SNMPv3 and MIB development tools and management product descriptions, tutorials and full feature product evaluations packages or call 416 737 0328 to discuss your specific needs.