



NerveCenter 7.0 Solaris Installation

**Oracle Solaris 10 and 11
NerveCenter 7.0**

July 2016

NCSS70-00-07

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1 Overview

This document provides instruction on how to prepare an Oracle Solaris system for use with **NerveCenter 7.0.00**, how to install NerveCenter on the Solaris host and how to manage NerveCenter together with the Solaris host following the installation.

This document is only a guide and is not intended to be a definitive set of instructions for all sites to follow. Your site requirements will dictate deviations. In general, these steps may be followed to prepare most Solaris systems for use with NerveCenter 7.0.00.

1.1 Terminology

NerveCenter is commonly deployed through two types of installations: NerveCenter *Servers* and NerveCenter *Clients*.

- * The **NerveCenter Server** is the software package that is installed on a Solaris system and runs as a service on that platform.
- * The **NerveCenter Client** is the software package that is installed on Microsoft Windows desktops and is used to access NerveCenter Servers running in your environment.

When NerveCenter Server is installed on a Solaris host, the result is the addition of NerveCenter as a runnable *service* much like other network services (ex: DNS, DHCP, LDAP Directory Servers, etc.). Thus the installed NerveCenter Server software package is referred to as the **NerveCenter Service**.

A running NerveCenter Service consists of a collection of processes, each providing function-specific duties as part of NerveCenter's overall network management operation. Core to this is the NerveCenter *Server process*, better referred to as **ncserver** so as to distinguish it apart from references to the overall NerveCenter Server software package. Other key processes of the NerveCenter Service are its *SNMP Pollers*, each referred to as an **ncsnmpoller**, associated SNMP Stacks and various notification listeners.

The NerveCenter Client software package, which runs on Microsoft Windows desktops, provides the means for monitoring and configuring NerveCenter Servers. It consists of an **Administrator** application, used for configuration review and editing, and a **Client** application, used for monitoring, creating and editing NerveCenter's alarm models, polls and trap masks.

This document focuses on installation and configuration of the NerveCenter Server software package. A separate document covers installation and usage of the NerveCenter Client package; see <http://docs.logmatrix.com/NerveCenter/7.0.00/>.



1.2 Applicable Solaris Distributions

LogMatrix develops and tests NerveCenter 7.0.00 for use on either Oracle Solaris 10 or Solaris 11. Earlier Solaris releases are not supported; OpenSolaris and its derivatives are not supported.

Supported Solaris Distributions

-  **Oracle Solaris 10** for SPARC
-  **Oracle Solaris 11** for SPARC

If your site has a need for a Solaris distribution outside of this set, contact LogMatrix for assistance.

LogMatrix highly recommends obtaining support access for your Solaris distribution and keeping your host system(s) updated with the latest patches.

2 Solaris Host Preparation

2.1 Solaris Installation

2.2 Network Configuration

While not required, LogMatrix recommends as a best practice that the Solaris host's network connections are configured to use static IPv4, and optionally IPv6, addresses. If DHCP is required for your environment, LogMatrix recommends that the DHCP Service is configured to provide a permanent reservation for the Solaris host system.

2.3 Groups and Users Accounts

NerveCenter 7.0 requires two entries, 'ncadmins' and 'ncusers', be defined in the Solaris host's group database (typically the file /etc/group). These groups are required to exist at the point of installation and will be used thereafter by NerveCenter during its operation.

Create the 'ncadmins' and 'ncuser's groups through the toolset provided with the Solaris operating environment.

NerveCenter Server runs in the context of a designated user account. This account must be a member of the 'ncadmins' group. There is no required name for this account.

Note: NerveCenter installation can occur before the 'ncadmins' group is populated. However in order for the NerveCenter installation to be completed, one or more user accounts need to be



added to the 'ncadmins' group. Instruction in section 4.1.1 User Account Selection revisits this step.

2.4 Host Software Package Provisioning

NerveCenter 7.0 consists of a number of both 32- and 64-bit applications. As a result, a set of 32-bit software packages need to be present in addition to their 64-bit equivalents.

2.4.1 Solaris 10

Ensure the following 32-bit libraries are installed before installing NerveCenter. To check, use `pkginfo(1)` for each of the Packages listed in Table 1 to verify the package is installed. Ex: “`pkginfo SUNWcry`”

Table 1 Required Oracle Solaris Software Packages (Solaris10)

Package	Contains
SUNWcry	<code>/usr/lib/libcrypt_d.so.1</code>
SUNWcsl	<code>/usr/lib/libpthread.so.1</code> <code>/usr/lib/libsocket.so.1</code>
SUNWlxml	<code>/usr/lib/libxml2.so.2</code>
SUNWlibC	<code>/usr/lib/libCrun.so.1</code> <code>/usr/lib/libCstd.so.1</code>

2.4.2 Solaris 11

Ensure the following 32-bit libraries are installed before installing NerveCenter. To check, use `pkg(1)` for each of the Packages listed in Table 2 to verify the package is installed. Ex: “`pkg info system/library`”

Table 2 Required Oracle Solaris Software Packages (Solaris11)

Package	Contains
system/library	<code>/usr/lib/libcrypt_d.so.1</code> <code>/usr/lib/libpthread.so.1</code> <code>/usr/lib/libsocket.so.1</code>
library/libxml2	<code>/usr/lib/libxml2.so.2</code>
system/library/c++runtime	<code>/usr/lib/libCrun.so.1</code>

2.5 Host Firewall Configuration

The NerveCenter Service – the NerveCenter Server and its related components – running on the Solaris host are accessed over your network from applications running on Windows desktops. The NerveCenter 7.0 Windows Desktop is the typical means for accessing NerveCenter Servers running in your environment. In order for this access to work, the firewall where the NerveCenter Server is running needs to be configured per the instructions below.

2.5.1 TCP/UDP Ports

In order for permit network access to the NerveCenter Service, the following ports need to be examined on the Solaris host firewall. To review and change the firewall configuration use the management tool provided for your firewall service.

Table 2 NerveCenter TCP Ports

32504/tcp	<p>Allows the NerveCenter Service to receive connections from NerveCenter Administrator (ncadmin.exe) and NerveCenter Client (ncclient.exe) applications running on Windows desktops.</p> <p>This port assignment is configurable via the 'Connections' tab of the NerveCenter Administrator application. The NerveCenter Service retains this value in its configuration file at /opt/OSInc/conf/nervecenter.xml .</p>
32505/tcp	<p>Allows the NerveCenter Service to receive notifications sent by other NerveCenter Servers and for NerveCenter Servers to access each other's Node Lists.</p> <p>Should your site have only one NerveCenter Server installation or not require NerveCenter-to-NerveCenter Informs or Node List acquisition, this port does not need to be open.</p> <p>This port assignment is configurable via the 'Connections' of the NerveCenter Administrator application. The NerveCenter Service retains this value in its configuration file at /opt/OSInc/conf/nervecenter.xml .</p>
32506/tcp	<p>Allows the NerveCenter Service to receive connections from NerveCenter Command (nccmd.exe), a command-line utility, running on Windows systems.</p> <p>Should your site not plan to use the NerveCenter Command utility from remote desktop hosts, this port does not need to be open.</p> <p>This port assignment is configurable via the 'Connections' tab of the NerveCenter Administrator application. The NerveCenter Service retains this</p>

	value in its configuration file at /opt/OSInc/conf/nervecenter.xml .
32508/tcp	<p>Allows the NerveCenter Service to receive connections to its API interface from scripts running on remote systems.</p> <p>Should your site not plan to use the NerveCenter API from remote systems or desktops, this port does not need to be open.</p> <p>This port assignment is configurable via the 'Connections' tab of the NerveCenter Administrator application. The NerveCenter Service retains this value in its configuration file at /opt/OSInc/conf/nervecenter.xml .</p>

In order to receive SNMP Notifications or to allow NerveCenter to respond to SNMP queries, two UDP ports need to be enabled in the firewall.

Table 3 NerveCenter UDP Ports

161/udp	<p>Allows the optional SNMP Management Interface component of the NerveCenter Service to receive incoming SNMP requests (Get, GetNext, GetBulk) from other network management platforms.</p> <p>Should you not have a need to poll the NerveCenter Service via SNMP, this port does not need to be open.</p> <p>This port assignment is configurable via the 'SNMP' tab of the NerveCenter Administrator application. The NerveCenter Service retains this value in its configuration file at /opt/OSInc/conf/nervecenter.xml .</p> <p>The NerveCenter SNMP Management Interface is not enabled by default. Setup is provided via the 'SNMP Agent' tab of the NerveCenter Administrator application.</p> <p>Note: If you are running the SNMP service provided by your Solaris distribution (most likely <i>snmpd</i> from the <i>net-snmp</i> packages), this will also be using 161/udp by default. If you want to run both the NerveCenter SNMP Management Interface and the net-snmp service, one or the other needs to be set to use a different port. Refer to the documentation at http://net-snmp.org/ on how to configure net-snmp.</p>
162/udp	<p>Allows NerveCenter Server to receive incoming SNMP notification messages (Trap and Inform PDUs) sent from SNMP Agents and other SNMP Management Applications.</p> <p>Should you not need to receive SNMP notifications, this port does not need to be open.</p>

This port assignment is configurable via the 'SNMP' tab of the NerveCenter Administrator application. The NerveCenter Service retains this value in its configuration file at `/opt/OSInc/conf/nervecenter.xml` .

Note: If you are running the SNMP Trap Receiver provided by your Solaris distribution (most likely `snmptrapd` from `net-snmp`), this will also be using `162/udp` by default. If you want to run both allow NerveCenter to receive SNMP notifications and run the `net-snmp snmptrapd` service, one or the other needs to set to use a different port. Refer to the documentation at <http://net-snmp.org/> on how to configure `net-snmp`.

2.5.2 ICMP Filtering

Review the firewall configuration's filtering of incoming ICMP traffic.

NerveCenter relies on ICMP and ICMPv6 messages for *Echo Request* and *Echo Reply* (the 'ping' command) as well as being able to receive *Destination Unreachable* notifications. These three ICMP message types need to be permitted through the firewall.

Additionally, NerveCenter can be used to monitor all incoming ICMP and ICMPv6 traffic, but only to the extent permitted by the firewall ICMP Filtering rules.

2.6 Solaris Services Configuration

2.6.1 SNMP Services

If your host is running the SNMP services provided with your Solaris distribution (likely `net-snmp`), they and the NerveCenter installation might conflict. Review the host service configuration and the service configuration of the `net-snmp` Master Agent (`snmpd`) and Trap Receiver (`snmptrapd`) to find whether these services are enabled and which ports they are accessing.

The `net-snmp` Master Agent and Trap Receiver will open `161/udp` and `162/udp` respectively by default.

If the NerveCenter Service is to be receiving incoming SNMP notification traffic, either NerveCenter or `net-snmp` must be configured to use a port other than `162/udp`.

If the NerveCenter SNMP Management Interface is to be enabled, either NerveCenter or the `net-snmp` service must be configured to use a port other than `161/udp`.

Refer to <http://net-snmp.org/> for documentation on how to configure and operate `net-snmp`.



2.6.2 RPC Services

Prior NerveCenter releases required a configured and running RPC service on the Solaris host. This requirement is entirely removed for NerveCenter 7.0. NC7.0 does not rely upon or use RPC.

2.7 Solaris Service Management Facility (SMF)

NerveCenter Server provides two optional SMF registrations. Neither registration is required. Instruction on how to register or unregister these two NerveCenter Server's Solaris SMF registrations is given in section x.x.x.

The NerveCenter Service may be registered as a Solaris SMF service. Registration is possible during installation but can be done afterwards. Registration allows the NerveCenter Service to be treated as a proper software service running on the Solaris host, monitored by the Solaris SMF and Solaris Fault Manager. LogMatrix recommends utilizing this registration but does not require it.

A separate SMF registration is provided for use with the NerveCenter Server SNMP Management Interface (the ability to monitor the NerveCenter Service at runtime via SNMP from other SNMP-capable services). This optional component of NerveCenter Server is included during installation but is not enabled. Registration allows for the NerveCenter SNMP Management Interface to be treated as a regular Solaris service, controlled by the Solaris SMF and Fault Manager elements.

3 NerveCenter Installation

NerveCenter installs to `/opt/OSInc`. The NerveCenter installation process will add `/var/opt/NerveCenter` beneath `/var/opt`. It will also create the file `/etc/pam.d/nervecenter` if directory `/etc/pam.d/` exists on the host and `/etc/pam.d/nervecenter` does not exist.

Complete the following steps in order to install NerveCenter 7.0 on the Solaris host.

1. Receive and expand the installation kit.

```
# gunzip NC7000-Solaris-BLDnn.tar.gz
```

Note: Replace the 'nn' with a number (ex: '32') so as to match the name of the received file.

```
# gtar -xf NC7000-Solaris-BLDnn.tar
```

Alternatively, combine these steps with the pipeline

```
# gzcata NC7000-Solaris-BLDnn.tar.gz | gtar xf -
```

This creates a folder `NC7000/` in the file system beneath where the command is executed.



- Install the NerveCenter product.

```
# cd NC7000/BIN
# ./install
```

The installer will check that the groups 'ncadmins' and 'ncusers' are defined for this system. If they are not, it will complain and exit. If this occurs, add the missing group(s) and then restart the installation with "*./install*"

During the installation, request the following components: **m s**

m – MIB Compiler
s – Server

During the installation, choose whether to register NerveCenter as a Solaris SMF service instance.

- * Respond with 'y' in order to have NerveCenter Server registered as a service that is controlled by the Solaris SMF and Fault Management elements.
- * Respond with 'n' to avoid any registration.
- * Regardless of your choice, registration can be setup or removed later as instructed in section 4.3 Service Registration.

4 NerveCenter Post-Installation

Following the installation, several setup steps need to be taken. Once these are performed, the service is ready for usage.

4.1 Permissions

The following sections present the permission setup required for configuring NerveCenter into the Solaris host environment.

4.1.1 User Account Selection

The NerveCenter Service is associated with a user account at runtime. Operations that NerveCenter performs are granted and limited based on the privileges granted to the selected account.

To setup the runtime account association, perform the following steps:

1. Select or create an account that will be used as the NerveCenter runtime account.
2. Add the selected account to the 'ncadmins' group in Solaris group database (typically /etc/group).

Note: The 'ncadmins' group needs to always contain this selected account but may contain additional accounts. All accounts that are a member of 'ncadmins' are granted NerveCenter Administrator access when logging in to the NerveCenter Service through the NerveCenter Client, Administrator or Command applications.

3. Optionally, setup the NerveCenter Startup Authorization File (ncstart-authorized).

This file is used as a protection over which accounts are allowed to run the NerveCenter Service. If the file is present, then only accounts listed in the file may start the NerveCenter Service. If the file is not present, then any member of the 'ncadmins' group may start the NerveCenter Service.

Create or edit */opt/OSInc/conf/ncstart-authorized* so that it contains each permitted account name between colons on separate lines.

Ex: if the permitted accounts are 'nervecenter' and 'admin', then the file should contain two lines

```
[01] :nervecenter:  
[02] :admin:
```

4. Optionally, setup the NerveCenter Startup User File (ncstart-user).

This file is used to identify the account to be used when NerveCenter is started at system boot or is started from a command prompt. If this file is present, its content names the account that is to be used. If this file is not present, then NerveCenter will run as the super-user account.

Create or edit the file */opt/OSInc/conf/ncstart-user* so that it contains the name of this account as its sole content on the first line. If NerveCenter is setup to be started at system boot time, this file is accessed to determine the account that is to be used for NerveCenter's operation.

Ex: if NerveCenter is to run as account 'nervecenter', then the file should contain 'nervecenter' is its sole content.

```
[01] nervecenter
```

Note: Unlike the *ncstart-authorized* file, the name in *ncstart-user* is not delimited with ':'s.

Note: Unlike the *ncstart-authorized* file, there can only be one entry in *ncstart-user*.

Note: If you setup NerveCenter with both a *ncstart-authorized* and a *ncstart-user* file,



ensure that the two files agree. The account named in *ncstart-user* must also be named in *ncstart-authorized*.

4.1.2 File Permission Setup

To ensure permissions are correct, run the script `/opt/OSInc/nc/bin/ncpermissions`. This script sets the owner, group, and access values for NerveCenter's directories and files under `/opt/OSInc/` and `/var/opt/NerveCenter/`.

`/opt/OSInc/nc/bin/ncpermissions`

Note: *ncpermissions* is meant for execution by the super-user account. Other accounts will not have privileges needed to set directory and file ownerships and permissions.

The command `/opt/OSInc/nc/bin/nccheckdirs` can be subsequently used to verify some of these directory settings.

`/opt/OSInc/nc/bin/nc/checkdirs`

Note: *nccheckdirs*, if run by the super-user account, will correct errors found in directory ownership and permission settings. When run by regular accounts, *nccheckdirs* will perform the checks but not attempt repairs.

4.2 License

The NerveCenter Service requires a license. A license is needed for each host where the NerveCenter Service will run. To obtain a license, whether for product evaluation, for permanent development or for production usage, contact Customer Support at LogMatrix.

The license for each host is supplied as a file. It needs to be placed at `/opt/OSInc/conf` such that it is named using the output from `hostname(1)` [`/bin/hostname`]. The file needs to end with a `.dat` suffix.

For example, if the output from `/bin/hostname` is "nms01", then the license for the host needs to be added to `/opt/OSInc/conf/` and named "nms01.dat".

If the output from `/bin/hostname` contains domain designations, then this needs to be included in the file's naming.

For example, if the output from `/bin/hostname` is "nms01.acme-services.co.uk", then the file needs to be named "nms01.acme-services.co.uk.dat".

4.3 Service Registration

This section provides instruction on how to change whether NerveCenter should be registered to start at system boot.



4.3.1 Solaris 10 and 11

Note: The NerveCenter installation script asks whether the NerveCenter Service should be registered to start a boot time. If this was agreed to, the following step has already been performed.

- ✿ To check whether NerveCenter Service is configured as a boot-time service:

Perform the following:

```
# /opt/OSInc/nc/install/ncservice isinstalled
```

- ✿ To register NerveCenter Service to be started at system boot:

Perform the following:

```
# /opt/OSInc/nc/install/ncservice install
```

This will place add the ncservice file to /etc/init.d and run the registration command appropriate for your Solaris 10 host.

- ✿ To unregister NerveCenter Service from being started at system boot:

Perform the following:

```
# /opt/OSInc/nc/install/ncservice uninstall
```

This will unregister the NerveCenter Service using the command appropriate for your Solaris 10 host. It will remove the file /etc/init.d/ncservice upon completion.

4.4 Solaris Link Editor/Loader

The NerveCenter Installer adds sets of shared libraries to a collection of directories under /opt/OSInc/lib and /opt/OSInc/lib64 .

The link loader/editor setup can be checked by running ldd(1) [/usr/bin/ldd] on several of the NerveCenter binaries. The output from ldd will show the resolution which the Solaris link editor/loader will perform when these binaries are started. If any of the entries are marked with “not found,” then the link loader cache needs further preparation. Should this occur, contact LogMatrix Support for assistance.

Table 4 Verifying Link Loader Bindings

Check 1: Verify ldd resolves run-time library bindings for NerveCenter Server (ncserver)
<pre># source /opt/OSInc/userfiles/ncenv.sh # source /opt/OSInc/etc/ncenv.sh # ldd /opt/OSInc/nc/bin/ncserver</pre>

```
libcrypt_d.so.1 => /usr/lib/libcrypt_d.so.1
libxerces-c-3.1.so => /opt/OSInc/lib/libxerces-c-3.1.so
libm.so.2 => /lib/libm.so.2
libdl.so.1 => /lib/libdl.so.1
libnsl.so.1 => /lib/libnsl.so.1
libpthread.so.1 => /lib/libpthread.so.1
librt.so.1 => /lib/librt.so.1
libsocket.so.1 => /lib/libsocket.so.1
libc.so.1 => /lib/libc.so.1
libmp.so.2 => /lib/libmp.so.2
libucrypto.so.1 => /lib/libucrypto.so.1
libelf.so.1 => /lib/libelf.so.1
libcryptoutil.so.1 => /lib/libcryptoutil.so.1
libz.so.1 => /lib/libz.so.1
```

Check 2: Verify ldd resolves run-time library bindings for NerveCenter SNMP Poller (ncsnmppoller)

ldd /opt/OSInc/nc/bin/ncsnmppoller

```
libpthread.so.1 => /lib/libpthread.so.1
libsocket.so.1 => /lib/libsocket.so.1
libnsl.so.1 => /lib/libnsl.so.1
librt.so.1 => /lib/librt.so.1
libCstd.so.1 => /usr/lib/libCstd.so.1
libCrun.so.1 => /usr/lib/libCrun.so.1
libthread.so.1 => /lib/libthread.so.1
libm.so.2 => /lib/libm.so.2
libc.so.1 => /lib/libc.so.1
libmp.so.2 => /lib/libmp.so.2
libucrypto.so.1 => /lib/libucrypto.so.1
libelf.so.1 => /lib/libelf.so.1
libcryptoutil.so.1 => /lib/libcryptoutil.so.1
libz.so.1 => /lib/libz.so.1
```

Check 3: Verify ldd resolves run-time library bindings for NerveCenter Security (ncsecurity)

ldd /opt/OSInc/nc/bin/ncsecurity

```
libpam.so.1 => /lib/64/libpam.so.1
libxml2.so.2 => /lib/64/libxml2.so.2
```



```
libz.so.1 => /lib/64/libz.so.1
libpthread.so.1 => /lib/64/libpthread.so.1
libm.so.2 => /lib/64/libm.so.2
libsocket.so.1 => /lib/64/libsocket.so.1
libnsl.so.1 => /lib/64/libnsl.so.1
libCstd.so.1 => /usr/lib/64/libCstd.so.1
libCrun.so.1 => /usr/lib/64/libCrun.so.1
libthread.so.1 => /lib/64/libthread.so.1
libc.so.1 => /lib/64/libc.so.1
libmp.so.2 => /lib/64/libmp.so.2
libcrypto.so.1 => /lib/64/libcrypto.so.1
libelf.so.1 => /lib/64/libelf.so.1
libcryptoutil.so.1 => /lib/64/libcryptoutil.so.1
```

5 Starting and Stopping the NerveCenter Service

5.1 Starting NerveCenter

NerveCenter Service can be started from the command-line or by the system at boot.

If NerveCenter has been registered to start at system boot, the service will be started on Solaris 10 by */etc/init.d/ncservice* for run level 3.

The NerveCenter Service may be started from a command prompt. To do so, execute:

```
# /opt/OSInc/bin/ncstart
```

For either a boot-time startup or a command prompt startup, NerveCenter Server will run using the user account indicated in */opt/OSInc/conf/ncstart-user* or else as the super-user account if this file is not present.

Note: For NerveCenter Service to be started from the command prompt (*/opt/OSInc/bin/ncstart*), the command needs to be run from a session using the super-user account or a user account that is a member of the 'ncadmins' group. If the file */opt/OSInc/conf/ncstart-authorized* is present, then the login must match an entry from that file.

5.2 Stopping NerveCenter

The NerveCenter Service can be stopped by the super-user account or by the account named in *ncstart-user* or else by the user account that ran */opt/OSInc/bin/ncstart*.

```
# /opt/OSInc/bin/ncstop
```



Attempts to halt the NerveCenter Service via other accounts will fail as they will not have the privileges required to halt the processes.

5.3 Checking Whether NerveCenter Has Been Started

The status of whether the NerveCenter Service is running can be checked.

`/opt/OSInc/bin/ncstatus`

5.4 Example of Starting and Stopping NerveCenter

The following shows a sequence of checking, starting, checking, stopping and then again checking the NerveCenter Service. These steps can be performed by a login that is a member of 'ncadmins'.

Table 5 Example NerveCenter Service Start/Stop Sequence

Step 1: Checking whether the NerveCenter Service is current running		
	\$ /opt/OSInc/bin/ncstatus nervecenter is stopped	Asks whether NerveCenter Service is current running.
Step 2: Start the NerveCenter Service		
	\$ /opt/OSInc/bin/ncstart	Start the NerveCenter Service (starts ncserver and its components)
Step 3: Checking whether the NerveCenter Service is running		
	\$ /opt/OSInc/bin/ncstatus	The 'ncstart' in Step 2 has launched the service.
Step 4: Stop the NerveCenter Service		
	\$ /opt/OSInc/bin/ncstop Stopping NC Server ... 5795 waiting 3 seconds for ncserver to terminate. waiting 3 seconds for ncserver to terminate. Stopping NC SNMP Poller(s) ... 5875 waiting 3 seconds for ncsnmppoller(s) to terminate.	Shutdown the NerveCenter Service
Step 5: Check whether the NerveCenter Service is currently running		
	\$ /opt/OSInc/nc/ncstatus nervecenter is stopped	Shows that the 'ncstop' in Step 4 has succeeded.

6 Verifying Login Access

Attempts at logging into the NerveCenter Service pass through the same process as logging in to the host as with *scp*, *ssh* or *login*. NerveCenter registers with the host PAM subsystem and can be administratively configured and monitored just as with *scp*, *ssh* or *login*.

This section explains NerveCenter's login mechanism and provides the steps needed for adding and maintaining account access to the NerveCenter Service.

6.1 Managing the PAM Integration

On Solaris 11 (only) NerveCenter Installer creates the file *nervecenter* in */etc/pam.d* if the file did not previously exist. If */etc/pam.d/nervecenter* existed before the execution of the NerveCenter Installer, the file is not overwritten or changed by the installation. (This procedure is a safeguard to prevent upgrades from overwriting changes that may have been made to */etc/pam.d/nervecenter*)

On Solaris 10 the PAM facility is configured by the file */etc/pam.conf* . The NerveCenter installation does not modify this file.

A set of default PAM integration files can be found in */opt/OSInc/nc/install* . The NerveCenter 7.0 Installer creates */etc/pam.d/nervecenter* by copying in one of:

✳ *pam_nervecenter_solaris10* for Solaris 10 hosts, or

✳ *pam_nervecenter_solaris11* for Solaris 11 hosts

NerveCenter's PAM integration is explained in '*Chapter 11: Managing NerveCenter Security*' of the manual **Managing NerveCenter**. The administrators for the Solaris host should review */etc/pam.conf* on Solaris 10 or */etc/pam.d/nervecenter* on Solaris 11 and edit the contents to suite the checks and actions are appropriate for the security of the operating environment.

Table 6 PAM Documentation References

NerveCenter 7.0 documentation on managing PAM registration.
See Chapter 11: 'Managing NerveCenter Security'

http://docs.logmatrix.com/NerveCenter/7.0.00/documentation/pdf/managing_nervecenter/managing_nervecenter.pdf

6.2 Managing User Access

Only login accounts that are members of the group 'ncadmins' or else the group 'ncusers' may be used to access the NerveCenter Service.

There are four means of accessing a NerveCenter 7.0 Service.

- * The NerveCenter Administrator (ncadmin.exe) application can log on to a NerveCenter Service only if the named user is a member of 'ncadmins'.
- * The NerveCenter Client (ncclient.exe) application can log on to a NerveCenter Service if the named user is a member of either 'ncadmins' or 'ncusers', but is given full editing abilities only when logged on with an account named in 'ncadmins'.
- * The NerveCenter Command-line Utility (nccmd.exe) can log onto a NerveCenter Server if the named user is a member of either 'ncadmins' or 'ncusers', but is give full editing abilities only when logged on with an account named in 'ncadmins'.
- * The NerveCenter Perl API can log onto a NerveCenter Server if the named user is a member of either 'ncadmins' or 'ncusers'. Full editing access is granted if the named account is in either group.

Group membership for either 'ncadmins' or 'ncusers' must be explicitly declared in the host group database (typically /etc/group). To associate an account with either group through the primary group setting of an account, as held in host password database (typically /etc/passwd), is not sufficient on some hosts; be sure the host's group database names all group members for 'ncadmins' and 'ncusers'. Use the appropriate configuration tool for reviewing and editing the host group database.

6.3 Testing User Access

Access to the NerveCenter Service can be tested on the Solaris host. This is done through an application that mimics the checking done by the NerveCenter Service when it is access by NerveCenter's Administrator, Client or Command-Line applications. The NerveCenter Service does not need to be running for this test to occur; it operates independently of the service's status.

To test user access, perform the following as the super-user:

```
# /opt/OSInc/nc/bin/nctestlogin
```

The application will ask for an account name and a password. The password is not shown as it is being entered. Use "-show" on the command-line if you want to visually check that the password is being correctly entered.



Table 7 Sample nctestlogin Session

```
# /opt/OSInc/nc/bin/nctestlogin -show

nctestlogin Version 7.0.00 (7000 BLD32), Solaris(sol10) / 64-bit Copyright
(C) 1989-2016 LogMatrix Inc.

Reading /opt/OSInc/conf/nervecenter.xml
PAM Registration: default, servicename{nervecenter}, authcheck{enabled},
accountcheck{enabled}

Enter user name and password. Or press Enter to quit.
login: ncadmin
password: my-secret-nervecenter-password
[2016-01-04 16:59:43] Begin authentication check for ncadmin@localhost
1. Check for User account
2. Begin PAM access. Using service name "nervecenter"
3. PAM Authentication Check
4. PAM Account Management Check
5. End PAM access
6. Checking Group Membership
   - Searching group 'root'. Members: (no match)
   - Searching group 'ncadmins'. Members: "ncadmin" (match)
   - Success. Granted 'ncadmins'-level access
[2016-01-04 16:59:43] "ncadmin" login granted with "ncadmins" access.
[2016-01-04 16:59:43] End authentication check for ncadmin@localhost

Enter user name and password. Or press Enter to quit.
login:
```

The nctestlogin performs the same set of checks, in the same sequence, as done by a running NerveCenter Service. The output shows the progression of six steps. If any step fails, the process stops.

Step	Success / Failure Criterion
1. Check for User account	Attempts a check, using getpwnam(3C), of the known user accounts as defined for the host's password database (ie: /etc/passwd, NIS, LDAP, etc.). Success: The account exists. Failure: Cannot find the account in the password database. Verify how accounts are set up on the host, being aware of possible Samba, NIS or LDAP integrations (ex: RedHat Directory Server, SUSE LDAP)

	Server, Microsoft Active Directory service, etc.).
2. Begin PAM access	<p>Opens connection to PAM using <code>pam_start(3PAM)</code>.</p> <p>Success: PAM is accessible.</p> <p>Failure: Unable to access PAM. Check that the super-user account is running <code>nctestlogin</code>. Verify presence, proper syntax and content of <code>/etc/pam.d/nervecenter</code>.</p>
3. PAM Authentication Check	<p>Verifies the provided account name and password using <code>pam_authenticate(3PAM)</code>.</p> <p>See the “auth” entries in <code>/etc/pam.d/nervecenter</code></p> <p>Success: The provided account and password are a valid combination.</p> <p>Failure: The combination is not valid. Verify the validity of the password. Verify that account is in good standing (ex: the password may have expired).</p>
4. PAM Account Management Check	<p>Verifies account standing and performs other checks using <code>pam_acct_mgmt(3PAM)</code>.</p> <p>See the “account” entries in <code>/etc/pam.d/nervecenter</code></p> <p>Success: The named account is in good standing.</p> <p>Failure: Some quality of the account fails a check. (ex: the account is expired or administratively locked out)</p>
5. End PAM access	<p>Closes connection to PAM. Uses <code>pam_end(3PAM)</code>.</p> <p>Always succeeds.</p>
6. Checking Group Membership	<p>Evaluates whether the named account is named by the groups ‘ncadmins’ or else ‘ncusers’. The check is done through <code>getgrnam(3C)</code>, thereby checking the host’s group database (ie: <code>/etc/group</code>, NIS, LDAP, etc.).</p> <p>Success: The account is named by ‘ncadmins’ or else ‘ncusers’.</p> <p>Failure: Either the groups are missing from <code>/etc/group</code> or membership is missing from the groups.</p>



7 NerveCenter 7.0.00 / Solaris Installation Checklist

- Prepare Host System
 - Ensure fixed IPv4 addressing
 - Update Host OS patches
 - Create groups 'ncadmins' and 'ncusers'
 - Check required software packages
 - Configure firewall
 - Check existing Solaris SNMP service configuration
- Install NerveCenter
 - Select install location (default: /opt/OSInc): _____
 - Select 'm s'
 - Choose whether to register NerveCenter for boot-time startup (y/n): _____
- Configure NerveCenter
 - Permissions: run /opt/OSInc/nc/bin/ncpermissions
 - Add license file to /opt/OSInc/conf
 - Select NC Service user account(s)
 - Optional: Create or select primary account: _____
 - Add account(s) to group 'ncadmins'
 - Optional: Setup file /opt/OSInc/conf/ncstart-authorized
 - Optional: Setup file /opt/OSInc/conf/ncstart-user
- Test NerveCenter Configuration
 - Check shared library registrations: Run "ldd /opt/OSInc/nc/bin/ncserver"
 - Check boot-time-registration: Check file "/etc/init.d/ncservice"
 - Check PAM integration: Check "/etc/pam.conf" or "/etc/pam.d/nervecenter"
 - Check account access. Run "/opt/OSInc/nc/bin/nctestlogin"



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LogMatrix is committed to offering the industry's best technical support to our customers and partners. You can quickly and easily obtain support for our NerveCenter proactive IT management software.

Professional Services

LogMatrix offers professional services, when customization of our software is the best solution for a customer. These services enable us, in collaboration with our partners, to focus on technology, staffing, and business processes as we address a specific need.

Educational Services

LogMatrix is committed to providing ongoing education and training in the use of our products. Through a combined set of resources, we can offer quality classroom style or tailored on-site training.

Contacting the Customer Support Center

Telephone Support

Phone: 1-800-892-3646 or 1-508-597-5300

E-Email support

E-mail: techsupport@logmatrix.com.

Online Access

For additional NerveCenter support information, please go the LogMatrix website www.logmatrix.com for access to the following sections of information.

- * Software Alerts – latest software alerts relative to NerveCenter.
- * User Community Access

You can seek as well as share advice and tips with other NerveCenter users at

<http://community.logmatrix.com/LogMatrix/> .

Contact Support@logmatrix.com for:

- * Patches and Updates – latest installation files, patches and updates including documentation for NerveCenter.



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