

Cleo® V6.0.7.19 SSL Quick Start Guide For Sun Solaris – Sparc

Read this section first!

This Quick Start Guide contains information about installing the 6.0.7.19 version of the Cleo TN3270/TN5250 software, the 6.0.7.15 version of the Cleo SNA(64 BIT) Gateway, and the 6.0.7.12 version of the Cleo SNA(32 BIT) Gateway. This version also supports a TN3270 **SSL** connection to a TNSERVER.

Important!

Read this document before installing and using the Cleo software. Refer to your Cleo SNA documentation for additional usage information. If you have questions about installing and using this product, contact Cleo Communications Technical Support between the hours of 8:30 AM and 5:00 PM (EST/EDT) at: (866) 444-2536 or support-en@cleo.com.



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Quick Start Guide Organization

Instructions for installation of three basic types of connections for Cleo V6.0.7.19 are provided in this Quick Start Guide:

- ▶ TN3270/TN5250 connection over TCP/IP
- ▶ Optionally a TNSERVER that supports SSL
- ▶ SNA connection over SDLC
- ▶ SNA connection over LAN (Ethernet)
- ▶ Appendix A – Cleo Utilities
- ▶ Appendix B – Kernel Tuning
- ▶ Appendix C – Host Configuration Information
- ▶ Appendix D – ***tnconfig*** Host Configuration Parameters
- ▶ Appendix E – ***snaconfig*** Host Configuration Parameters
- ▶ Appendix F – Default Values for SNA Configuration Files
- ▶ Appendix G – SUN HSI/PCI Adapter

Follow the Guide that describes your network configuration.

For more information, please refer to the Cleo Installation Guide and the Cleo Administration Guide included with your product.

Appendix C contains a questionnaire for obtaining necessary host information. **It is recommended that you obtain this information before you install because some of the this information is required during the install process.**

TN3270/TN5250 Connection Over TCP/IP

Installation of a Cleo Enterprise Networking product requires that you obtain a License file (license.conf) and a 6 Digit Cleo Serial Number. The License file is available from Cleo Communications' Sales Department at (866) 444-2536. The Cleo Serial Number will appear on your Cleo Software shipment. If you do not have a Cleo Serial Number available, please call the Cleo Communications' Sales Department.

Software Prerequisites:

- ▶ SOLARIS 2.5, 2.6, 7 or 8

Note: If you are adding or upgrading your SNA connection to a TN3270/TN5250 connection, please enter the following command:

```
# /opt/sna/bin/sna stop
```

Installing Cleo TN3270/TN5250 and SSL

NOTE: These procedures assume you are installing from a CD. However, if you downloaded the product you only need to execute steps 1, 3, 4 and 6 with the following change. Replace the mount point of the CD (/cdrom/cdrom0) with the complete pathname of the downloaded product (e.g. /tmp/cleotn).

1. Login as *root*.
2. Insert the CD into the CD-ROM drive.
3. Start the installation of the TN3270/TN5250 Package

```
# cd /cdrom/cdrom0
```

```
# pkgadd -d ./cleotn
# pkgadd -d ./cleotdoc  (optional)
# ./cleoadd
```

```
You are about to run the cleoadd script, version 6.0.7.19,
which will install utilities for creating configuration files
and installing Cleo license files.
Do you wish to continue? (y/n): y
Installing files in /opt/tn3270/bin and /etc/opt/tn3270 ...
Would you like to install the cleotn license file now? (y/n): y
Please enter the Cleo TN3270/TN5250 Serial Number
xxxxxx
Please confirm that you want to change the Cleo TN3270/TN5250
Serial Number to the value
      ==> xxxxxxx <==
?[y/n]
y
Enter the full path name of the license file to install:
/tmp/license.conf
Contents of your license file:

*****
License type:      Temporary
Expiry date:      Thu Jul 20 00:00:00 2000
Shelf life:       <none>
Box name:         <none>
Total sessions:   500
*****

Do you wish to continue? (y/n): y
Stopping the TN3270/TN5250 License Daemon
Saving old license in license.bak.
The license is now installed in /etc/opt/tn3270.
Starting the TN3270/TN5250 License Daemon
```

4. Remove the CD from the drive. Store the CD and the software license file (license.conf) in a safe place. They are needed should you ever re-install the software.
5. Set your path to include the new components with the following commands in your profile:

```
# PATH=$PATH:/opt/tn3270/bin:/opt/tn3270/bin/X11
# export PATH
```

6. Based on your needs, you may be required to increase your kernel resources by tuning some parameters. Please refer to **Appendix B** of this manual and the Cleo Installation Guide Chapter 4.
7. Cleo Communications supplies several optional utility scripts and programs that may be useful for automated kernel tuning, and starting and stopping TN3270/TN5250 emulators. Please refer to **Appendix A** of this manual for details.

Instructions for Installing or Updating License

NOTE: Cleo Communications will supply the license.conf file to you.

Install the license file (this step can be included with the previous cleoad function)

```
# /opt/tn3270/bin/tnaddlic
```

Enter the full path name of the license file to install:

```
/tmp/license.conf
```

Contents of your license file:

```
*****  
License type:      Temporary  
Expiry date:      Thu Jul 20 00:00:00 2000  
Shelf life:       <none>  
Box name:         <none>  
Total sessions:   500  
*****
```

Do you wish to continue? (y/n): y

Stopping the TN3270/TN5250 License Daemon

Saving old license in license.bak.

The license is now installed in /etc/opt/tn3270.

Starting the TN3270/TN5250 License Daemon

Instructions for Installing, Displaying, or Modifying Cleo Serial Number

NOTE: Cleo Communications supplies the Cleo Serial Number with your software shipment.

Install the serial number(this step can be included with the previous cleoad function)

```
# /opt/tn3270/bin/cleoserial -w xxxxxx
  Where: xxxxxx is the Cleo 6 digit Serial Number
```

Please confirm that you want to change the Cleo TN3270/TN5250 Serial Number to the value

==> xxxxxx <==

?[y/n]

y

Display the serial number

```
# /opt/tn3270/bin/cleoserial -r
```

The Cleo TN3270/TN5250 Serial Number has a value of

==> xxxxxx <==

Modify the serial number

```
# /opt/tn3270/bin/cleoserial -w yyyyyy
  Where: yyyyyy is the new Cleo 6 digit Serial Number
```

The Current Cleo TN3270/TN5250 Serial Number has a value of

==> xxxxxx <==

Do you want to change the Serial Number to the value

==> yyyyyy <==

?[y/n]

y

Instructions for Configuring the TN3270/TN5250

1. The program **tnconfig** must be executed to make the scripts for starting the TN3270/TN5250 sessions. Please see **Appendix D** for more details about **tnconfig**.

To use TN3270 sessions from a pool of **lus** on one host, execute **tnconfig** by entering the following command, and then **proceed to step 10**:

```
# tnconfig -h host_name[:port id] -n number of lus
```

Note: The default portid is 23 and the default protocol type is TN3270.

A sample execution of tnconfig is as follows (for port 99):

```
# tnconfig -h tnsna:99 -n 24
```

To use TN3270 sessions from a pool of **lus** on one host/tserver that supports **SSL**, execute **tnconfig** by entering the following command, and then **proceed to step 10**:

```
# tnconfig -h host_name[:port id] -n number of lus -ssl 3
```

Note: The default portid is 23 and **-ssl 3** sets the connection type to SSL Version 3. The host/tserver must support **SSL**.

A sample execution of tnconfig is as follows (for port 99) to a host/tserver that supports SSL Version 3 :

```
# tnconfig -h tnsna:99 -n 24 -ssl 3
```

To use TN5250 sessions from a pool of **lus** on one host, execute **tnconfig** by entering the following command, and then **proceed to step 10**:

```
# tnconfig -h host_name[:port id] -n number of lus -p 5
```

Note: The default portid is 23 and **-p 5** sets the protocol type to TN5250.

A sample execution of tnconfig is as follows (for port 99):

```
# tnconfig -h tnsna:99 -n 24 -p 5
```

Note: In these examples, the symbolic host name “tnsna” must be listed in the “/etc/hosts” file.

NOTE: Step 1 is the most common configuration method, for both TN3270 and TN5250.

2. **ONLY if it is required**, to use TN3270 and TN5250 from pools of LUs on multiple hosts, execute **tnconfig** by entering the following command, then **proceed to step 10**.

```
# tnconfig -h host32701[:port id],host52501[:port id],host32702[:portid],host52502[:port id] -n #lus for host327001,#lus for host52501,#lus for host32702,#lus for host52502 -p 3,5,3,5
```

3. **ONLY if it is required**, to use TN3270 SSL with pools of LUs on multiple hosts, execute **tnconfig** by entering the following command, then **proceed to step 10**.

```
# tnconfig -h host3270ssl1[:port id],host3270ssl2[:port id]-n #lus for host3270ssl1,#lus for host3270ssl2 -ssl 3
```

4. **ONLY if it is required**, to use TN3270 or TN3270 SSL sessions with specific LU Names on one host, execute **tnconfig** by entering the following command, and then **proceed to step 10**:

```
# tnconfig -h host_name[:port id] -n number of lus -l luname 1,luname 2,...,luname x
```

A sample execution of tnconfig without SSL is as follows:

```
# tnconfig -h tnsna -n 32 -l lu1,lu2,...,lu32
```

A sample execution of tnconfig with SSL is as follows:

```
# tnconfig -h tnsna -n 32 -l lu1,lu2,...,lu32 -ssl 3
```

5. **ONLY, if it is required**, to use TN5250 sessions with specific DEVICE NAMES, on one host, execute **tnconfig** by entering the following command, and then **proceed to step 10**.

```
# tnconfig -h host name[:port id] -n number of lus -l IBM-3180,IBM-3477-FC,...,IBM-3477FG -p 5
```

6. **ONLY, if it is required**, to use TN3270 or TN3270 SSL sessions from pools of lus on multiple hosts, execute **tnconfig** by entering the following command, and then **proceed to step 10**:

```
# tnconfig -h host_name 1[:port id],host name 2[:port id],...,host_name x[:port id] -n number of lus for host_name 1,number of lus for host_name 2,...,number of lus for host_name x
```

A sample execution of tnconfig without SSL is as follows:

```
# tnconfig -h host1,host2,host3 -n 10,12,10
```

A sample execution of tnconfig with SSL is as follows:

```
# tnconfig -h host1,host2,host3 -n 10,12,10 -ssl 3
```

7. **ONLY, if it is required**, to use TN5250 sessions from pools of lus on multiple hosts, execute **tnconfig** by entering the following command, and then **proceed to step 10**.

```
# tnconfig -h host name 1[:port id],host name 2[:port id],...,host name x[:port id] -n number of lus for host name 1,number of lus for host name 2,...,number of lus for host name x -p 5,5,...,5
```

A sample execution of tnconfig is as follows:

```
# tnconfig -h host1,host2,host3 -n 10,12,2 -p 5,5,5
```

8. **ONLY, if it is required**, to use TN3270 or TN3270 SSL sessions with specific LU Names on multiple hosts, execute **tnconfig** by entering the following command, and then **proceed to step 10**:

```
# tnconfig
  -h host_name 1[:port id],host_name 2[:port id],...,host_name
  x[:port id]

  -n number of lus for host_name 1,number of lus for host_name
  2,...,number of lus for host_name x

  -l luname 1 for host_name 1,...,luname 1 for host_name
  2,...,luname 1 for host_name x,...,luname for last lu for
  host_name x
```

A sample execution of tnconfig without SSL is as follows:

```
# tnconfig -h host1,host2,host3
  -n 2,4,2
  -l lu1h1,lu2h1,lu1h2,lu2h2,lu3h2,lu4h2,lu1h3,lu2h3
```

A sample execution of tnconfig with SSL is as follows:

```
# tnconfig -h host1,host2,host3
  -n 2,4,2
  -l lu1h1,lu2h1,lu1h2,lu2h2,lu3h2,lu4h2,lu1h3,lu2h3
  -ssl 3
```

9. **ONLY, if it is required**, to use TN5250 sessions with specific DEVICE NAMES on multiple hosts, execute **tnconfig** by entering the following command, and then **proceed to step 10**.

```
# tnconfig
  -h host name 1[:port id],host_name 2[:port id],...,host_
  namex[:port id]

  -n number of lus for host_name 1,number of lus for host_name
  2,...,number of lus for host_name x

  -l DEVNAME for host_name 1,DEVNAME for host_name 2,...,DEVNAME
  for host_name x

  -p 5,5,...,5
```

A sample execution of tnconfig is as follows:

```
# tnconfig -h host52501,host52502,host52503 -n 2,3,2
-l dev1h1,dev2h1,dev1h2,dev2h2,dev3h2,dev1h3,dev2h3
-p 5,5,5
```

10. As a result of running **tnconfig**, a utility script **tnstart** is created in the `/opt/tn3270/bin` directory and specific configuration text files are created in the `/etc/opt/tn3270` directory. Run the **tnstart** utility if you want to start up configured tn3270 emulators in the background. If you run the Cleo utility **cleostart_tn** (described in **Appendix A.**), **tnstart** will be run automatically by the **cleostart_tn** utility.

Run the **mktncfg** utility to convert the newly created *tnconfig* text file(`com.txt`) to binary. This will create a `/etc/opt/tn3270/com.cfg` file. Run the following syntax and then **Proceed to step 11:**

```
# mktncfg
```

11. **NOTE: If there are specific requirements, not met in steps 1-4,** then configure the TN3270 software by editing the `/etc/opt/tn3270/tn3270-1a.txt` (created by **tnconfig**) or the `com.txt` file (see below). To configure specific requirements ...(see the *TN3270 Administration Guide* for assistance on configuration): to convert the `com.txt` file to the executable binary, perform the following:

```
# cd /etc/opt/tn3270
# cp /opt/tn3270/samples/tnsample.txt com.txt
# vi com.txt
# /opt/tn3270/bin/tncfgtcp com.txt
```

NOTE:

To enable SSL, right after the line that specifies the type of TN3270 Support, for example:

```
tn3270_support = TN3270E
```

place the following line to enable SSL:

```
ssl_support = SSL3
```

12. Reboot the UNIX operating system. NOTE: only required if you tuned the kernel.

Run TN3270/TN5250

Select the appropriate style file in the `/etc/opt/tn3270` directory for the number of TN3270E sessions each user will have per each invocation of `tn3270`.

```
tn3270-1.stu    = 1  TN3270E session per invocation
tn3270-2.stu    = 2  TN3270E sessions per invocation
tn3270-3.stu    = 3  TN3270E sessions per invocation
tn3270-4.stu    = 4  TN3270E sessions per invocation
tn3270-5.stu    = 5  TN3270E sessions per invocation
tn3270-6.stu    = 6  TN3270E sessions per invocation
tn3270-7.stu    = 7  TN3270E sessions per invocation
tn3270-8.stu    = 8  TN3270E sessions per invocation
tn3270-9.stu    = 9  TN3270E sessions per invocation
tn3270-0.stu    = 10 TN3270E sessions per invocation
```

A sample execution of 1 TN3270E session per single user invocation:

```
# tn3270 -s /etc/opt/tn3270/tn3270-1.stu
```

A sample execution of 5 TN3270E sessions per single user invocation:

```
# tn3270 -s /etc/opt/tn3270/tn3270-5.stu
```

NOTE: If you have any problems using function keys, with the terminal emulator you are using to run the Cleo TN3270 software, then you may want to try an alternate set of style files. These style files do not use Function Keys to define 3270 PF keys.

```
c3270-1.stu    = 1  TN3270E session per invocation
c3270-2.stu    = 2  TN3270E sessions per invocation
c3270-3.stu    = 3  TN3270E sessions per invocation
c3270-4.stu    = 4  TN3270E sessions per invocation
c3270-5.stu    = 5  TN3270E sessions per invocation
c3270-6.stu    = 6  TN3270E sessions per invocation
c3270-7.stu    = 7  TN3270E sessions per invocation
c3270-8.stu    = 8  TN3270E sessions per invocation
c3270-9.stu    = 9  TN3270E sessions per invocation
```

```
c3270-0.stu      = 10 TN3270E sessions per invocation
```

A sample execution of 1 TN3270E session per single user invocation, using the alternate style files:

```
# tn3270 -s /etc/opt/tn3270/c3270-1.stu
```

A sample execution of 5 TN3270E sessions per single user invocation, using the alternate style files:

```
# tn3270 -s /etc/opt/tn3270/c3270-5.stu
```

TN3270/TN5250 Removal

1. Login in as *root*.
2. Terminate any running instances of the TN3270/TN5250product by entering the following command:

```
# /opt/tn3270/bin/cleostop_tn
```

3. Remove the Cleo TN3270/TN5250 by entering the following commands:

```
# cleormv  
# pkgrm cleotdoc  
# pkgrm cleotn
```

SNA Connection Over SDLC

Installation of a Cleo Enterprise Networking product requires that you obtain a License file (license.conf) and a 6 Digit Cleo Serial Number. The License file is available from Cleo Communications' Sales Department at (866) 444-2536. The Cleo Serial Number will appear on your Cleo Software shipment. If you do not have a Cleo Serial Number available, please call the Cleo Communications' Sales Department.

Software Prerequisites

- ▶ SOLARIS 2.5, 2.6, 7 or 8

Internal Serial Port Hardware Prerequisites (one of the following):

- ▶ SE_HDLC serial (PCI)
- ▶ ZSH serial (Sbus)
- ▶ SUN HSI /S
- ▶ SUN HSI /PCI

For QLLC/X.25, follow the same instructions below with the:

- ▶ SUN Solstice X.25 product

Follow the instructions included with your adapter for installation of the SE_HDLC (PCI), Sun HSI /S, or Sun HSI /pci cards and drivers

For more specific information about installing and configuring the SUN HIS/PCI adapter see **Appendix G**.

Installing the Cleo SNA Gateway Software

NOTE: These procedures assume you are installing from a CD. However, if you downloaded the product you only need to execute steps 1, 3, 4 and 6 with the following change. Replace the mount point of the CD (/cdrom/cdrom0) with the complete pathname of the downloaded product (e.g. /tmp/cleosna).

1. Log in as *root*.
2. Insert the CD into the CD-ROM drive.
3. Start the installation of the Cleo SNA Package

```
# cd /cdrom/cdrom0
# pkgadd -d ./cleosna      (for 32 BIT SNA)
                        OR
# pkgadd -d ./cleosna64  (for 64 BIT SNA)
# pkgadd -d ./cleodocs   (optional)
# ./cleoadd
```

```
You are about to run the cleoadd script, version 6.0.7.19,
which will install utilities for creating configuration files
and installing Cleo license files.
Do you wish to continue? (y/n): y
Installing files in /opt/sna/bin and /etc/opt/sna ...
Would you like to install the cleosna license file now? (y/n): y
Please enter the Cleo SNA Serial Number
xxxxxxx
Please confirm that you want to change the Cleo SNA Serial Number
to the value
      ==> xxxxxx <==
?[y/n]
y
Enter the full path name of the license file to install:
/tmp/license.conf
Contents of your license file:
*****
License type:      Temporary
Expiry date:      Thu Jul 20 00:00:00 2000
Shelf life:       <none>
```

```
Box name:          <none>
PU concentration:  Not licensed
TN Server:         Not licensed
HPR:              Not licensed
LU 0-3 sessions:  32
APPC sessions:    32
Total sessions:   64
Users:            unlimited
*****
```

```
Do you wish to continue? (y/n): y
Saving old license in license.bak.
The license is now installed in /etc/opt/sna.
You must stop and restart the SNA software for
the new license to become active.
```

4. Remove the CD from the drive. Store the CD with the Software License file in a safe place. They are needed should you ever re-install the software.
5. Set your path to include the new components with the following commands in your profile:

```
# PATH=$PATH:/opt/sna/bin:/opt/sna/bin/X11
# export PATH
```
6. Based on your needs, you may be required to increase your kernel resources by tuning some parameters. Please refer to **Appendix B** of this manual and the Cleo Installation Guide Chapter 4.
7. Cleo Communications supplies several optional utility scripts and programs that may be useful for automated kernel tuning, starting and stopping SNA 3270 emulators, and obtaining SNA protocol traces. Please refer to **Appendix A** of this manual for details.

Instructions for Installing or Updating License

NOTE: Cleo Communications will supply the license.conf file to you.

Install the license file (this step can be included with the previous **cleoad** function)

```
# /opt/sna/bin/snaaddlic
```

Enter the full path name of the license file to install:

```
/tmp/license.conf
```

Contents of your license file:

```
*****  
License type:      Temporary  
Expiry date:      Thu Jul 20 00:00:00 2000  
Shelf life:       <none>  
Box name:         <none>  
PU concentration: Not licensed  
TN Server:        Not licensed  
HPR:              Not licensed  
LU 0-3 sessions: 32  
APPC sessions:   32  
Total sessions:  64  
Users:           unlimited  
*****
```

Do you wish to continue? (y/n): y

Saving old license in license.bak.

The license is now installed in /etc/opt/sna.

You must stop and restart the SNA software for the new license to become active.

Instructions for Installing, Displaying, or Modifying Cleo Serial Number

NOTE: Cleo Communications supplies the Cleo Serial Number with your software shipment.

Install the serial number(this step can be included with the previous cleoad function)

```
# /opt/sna/bin/cleoserial -w xxxxxx
  Where: xxxxxx is the Cleo 6 digit Serial Number
```

Please confirm that you want to change the Cleo SNA Serial Number to the value

==> xxxxxx <==

?[y/n]

y

Display the serial number

```
# /opt/sna/bin/cleoserial -r
```

The Cleo SNA Serial Number has a value of

==> xxxxxx <==

Modify the serial number

```
# /opt/sna/bin/cleoserial -w yyyyyy
  Where: yyyyyy is the new Cleo 6 digit Serial Number
```

The Current Cleo SNA Serial Number has a value of

==> xxxxxx <==

Do you want to change the Serial Number to the value

==> yyyyyy <==

?[y/n]

y

Configuring Cleo SNA Gateway

Installation of the Cleo SNA Gateway software and Unix Driver is now complete. Utilize the "**xnaadmin**" GUI utility for configuring the SNA Gateway. (see the Cleo Administration Guide...section *Administration Tools*)

OR

You can configure the Cleo SNA Gateway software for 3270 sessions, using the "**snaconfig**" command line program. To configure, Edit the **SNA SDLC CONFIGURATION TEXT** file (*/etc/opt/sna/snasdcl.txt*) and then running the "**snaconfig**" program to update the Cleo SNA Software's configuration.

Running "**snaconfig**" AFTER editing the SNA SDLC CONFIGURATION TEXT file

1. If the SNA Software is running, then Stop the SNA Software by entering the following command:

```
# /opt/sna/bin/sna stop
```

2. Edit the default SNA SDLC CONFIGURATION TEXT file (*/etc/opt/sna/snasdcl.txt*) supplying your Host system's specific parameters. Note: See **Appendix E**. for a definition of the Host Configuration Parameters in the **SNA SDLC CONFIGURATION TEXT** file. See **Appendix F**. for the file's default values.
3. Update the Cleo SNA Software's configuration using the following command:

```
# /opt/sna/bin/snaconfig -S (where -S = SDLC)
```

4. As a result of running **snaconfig -S**, a utility script **snastart** is created in the */opt/sna/bin* directory. Run the **snastart** utility, after starting the SNA Server, if you want to start up configured sna3270 emulators in the background. If you run the Cleo utility **cleostart_sna**, (described in **Appendix A**), **snastart** will be run automatically by the **cleostart_sna** utility.

5. If this is a new installation, then go to the "**Starting Cleo SNA Server**" section.
6. If you are modifying an existing System configuration and need to restart the SNA Software, then enter the following command:

```
# /opt/sna/bin/sna start
```

7. If this is a new installation, then go to the "**Starting Cleo SNA Server**" section.
8. If you are modifying an existing System's configuration, and need to restart the SNA Software, then enter the following command:

```
# /opt/sna/bin/sna start
```

Starting Cleo SNA Server

The quickest way of starting Cleo SNA is to issue the following commands (assumes correct PATH... PATH=\$PATH:/opt/sna/bin:/opt/sna/bin/X11):

```
# sna start
# xsnaadmin
```

The xsnaadmin program is a Motif-based administrative program. It contains extensive on-line help which will guide you through setting up a configuration from scratch.

Or

Start Cleo SNA Server from the command line

```
# sna start
# snaadmin init_node
# snaadmin start_port,port_name=xxxx      (where xxxx is the name of the
                                           port... i.e.  SDLCP0)
# snaadmin start_ls,ls_name=xxxx         (where xxxx is the name of the
                                           Link Station... i.e.  SDLCL0)
```

Run SNA3270

select the appropriate style file in the /etc/opt/sna directory for the number of SNA3270 sessions each user will use per each invocation of sna3270.

```
s3270-1.stu    = 1  sna3270 session per invocation
s3270-2.stu    = 2  sna3270 sessions per invocation
s3270-3.stu    = 3  sna3270 sessions per invocation
s3270-4.stu    = 4  sna3270 sessions per invocation
s3270-5.stu    = 5  sna3270 sessions per invocation
s3270-6.stu    = 6  sna3270 sessions per invocation
s3270-7.stu    = 7  sna3270 sessions per invocation
s3270-8.stu    = 8  sna3270 sessions per invocation
s3270-9.stu    = 9  sna3270 sessions per invocation
s3270-0.stu    = 10 sna3270 sessions per invocation
```

A sample execution of 1 SNA3270 session per single user invocation:

```
# sna3270 -s /etc/opt/sna/s3270-1.stu
```

A sample execution of 5 SNA3270 sessions per single user invocation:

```
# sna3270 -s /etc/opt/sna/s3270-5.stu
```

NOTE: If you have any problems using function keys, with the terminal emulator you are using to run the Cleo SNA3270 software, then you may want to try an alternate set of style files. These style files do not use Function Keys to define 3270 PF keys.

```
cs3270-1.stu    = 1  SNA 3270 session per invocation
cs3270-2.stu    = 2  SNA 3270 sessions per invocation
cs3270-3.stu    = 3  SNA 3270 sessions per invocation
cs3270-4.stu    = 4  SNA 3270 sessions per invocation
cs3270-5.stu    = 5  SNA 3270 sessions per invocation
cs3270-6.stu    = 6  SNA 3270 sessions per invocation
cs3270-7.stu    = 7  SNA 3270 sessions per invocation
```

```
cs3270-8.stu    = 8  SNA 3270 sessions per invocation
cs3270-9.stu    = 9  SNA 3270 sessions per invocation
cs3270-0.stu    = 10 SNA 3270 sessions per invocation
```

A sample execution of 1 SNA3270 session per single user invocation, using the alternate style files:

```
# sna3270 -s /etc/opt/sna/cs3270-1.stu
```

A sample execution of 5 TN3270E sessions per single user invocation, using the alternate style files:

```
# sna3270 -s /etc/opt/sna/cs3270-5.stu
```

Cleo SNA Gateway Removal

1. Login in as *root*.
2. Terminate any running instances of the product by entering the following command:

```
# /opt/sna/bin/sna stop
```

3. Remove the Cleo SNA Gateway by entering the following commands:

```
# cleormv  
# pkgrm cleodocs  
# pkgrm cleosna
```

4. Perform an orderly shutdown(eg. **/etc/shutdown**) and reboot the system.

SNA Connection Over LAN (Ethernet)

Installation of a Cleo Enterprise Networking product requires that you obtain a License file (license.conf) and a 6 Digit Cleo Serial Number. The License file is available from Cleo Communications' Sales Department at (866) 444-2536. The Cleo Serial Number will appear on your Cleo Software Shipment. If you do not have a Cleo Serial Number available, please call the Cleo Communications' Sales Department.

Software Prerequisites

- ▶ SOLARIS 2.5, 2.6, 7 or 8

Hardware Prerequisites

- ▶ SUN
- ▶ SUN TRI/P
- ▶ Ethernet – Use existing internal Ethernet connection

Installing the LAN UNIX Network Driver

Use the instructions that come with each card and your operating system administration guide.

Note: It is important that you install your hardware components before you install the Cleo SNA Gateway software.

Ethernet Driver Requirements

The Default setting for the Cleo SNA software running on Solaris Sparc systems is to use /dev/hme as the Ethernet driver. If you receive a message similar to the following, when configuring an Ethernet port or link, your system is using a different Ethernet device driver.

EXAMPLE MESSAGE:

```
11:17:28 EST 20 Dec 2000 4099-15(0-1) E (sparc5) PID 262 (snadaemon)
Failed to open device /dev/hme.
Errno = 6
```

.....

Below are some possible Ethernet drivers your system may be configured to use.

```
-----
/dev/eri
/dev/ge
/dev/qfe
/dev/qe
/dev/be
/dev/le
/dev/elx
-----
```

.....

Please determine what driver is installed on the system and change the “/dev/hme” setting in the /etc/opt/sna/snadc.ini file to match it. When this is complete, restart SNA to pick up the new driver setting.

Installing the Cleo SNA Gateway Software

NOTE: These procedures assume you are installing from a CD. However, if you downloaded the product you only need to execute steps 1, 3, 4 and 6 with the following change. Replace the mount point of the CD (/cdrom/cdrom0) with the complete pathname of the downloaded product (e.g. /tmp/cleosna).

1. Log in as *root*.
2. Insert the CD into the CD-ROM drive.
3. Start the installation of the Cleo SNA Package

```
# cd /cdrom/cdrom0
# pkgadd -d ./cleosna      (for 32 BIT SNA)
                        OR
# pkgadd -d ./cleosna64  (for 64 BIT SNA)
# pkgadd -d ./cleodocs   (optional)
# ./cleoadd
```

```
You are about to run the cleoadd script, version 6.0.7.19,
which will install utilities for creating configuration files
and installing Cleo license files.
Do you wish to continue? (y/n): y
Installing files in /opt/sna/bin and /etc/opt/sna ...
Would you like to install the cleosna license file now? (y/n): y
Please enter the Cleo SNA Serial Number
xxxxxx
Please confirm that you want to change the Cleo SNA Serial Number
to the value
      ==> xxxxxx <==
?[y/n]
y
Enter the full path name of the license file to install:
/tmp/license.conf
Contents of your license file:
*****
License type:      Temporary
Expiry date:      Thu Jul 20 00:00:00 2000
Shelf life:       <none>
```

```

Box name:          <none>
PU concentration: Not licensed
TN Server:        Not licensed
HPR:             Not licensed
LU 0-3 sessions: 32
APPC sessions:   32
Total sessions:  64
Users:           unlimited
*****

```

```

Do you wish to continue? (y/n): y
Saving old license in license.bak.
The license is now installed in /etc/opt/sna.
You must stop and restart the SNA software for
the new license to become active.

```

4. Remove the CD from the drive. Store the CD with the Software License file in a safe place. They are needed should you ever re-install the software.
5. Set your path to include the new components with the following commands in your profile:

```

# PATH=$PATH:/opt/sna/bin:/opt/sna/bin/X11
# export PATH

```
6. Based on your needs, you may be required to increase your kernel resources by tuning some parameters. Please refer to **Appendix B** of this manual and the Cleo Installation Guide Chapter 4.
7. Cleo Communications supplies several optional utility scripts and programs that may be useful for automated kernel tuning, starting and stopping SNA 3270 emulators, and obtaining SNA protocol traces. Please refer to **Appendix A** of this manual for details.

Instructions for Installing or Updating License

NOTE: Cleo Communications will supply the license.conf file to you.

Install the license file (this step can be included with the previous cleoad function)

```
# /opt/sna/bin/snaaddlic
```

Enter the full path name of the license file to install:

```
/tmp/license.conf
```

Contents of your license file:

```
*****  
License type:      Temporary  
Expiry date:      Thu Jul 20 00:00:00 2000  
Shelf life:       <none>  
Box name:         <none>  
PU concentration: Not licensed  
TN Server:        Not licensed  
HPR:              Not licensed  
LU 0-3 sessions: 32  
APPC sessions:   32  
Total sessions:  64  
Users:           unlimited  
*****
```

Do you wish to continue? (y/n): y

Saving old license in license.bak.

The license is now installed in /etc/opt/sna.

You must stop and restart the SNA software for the new license to become active.

Instructions for Installing, Displaying, or Modifying Cleo Serial Number

NOTE: Cleo Communications supplies the Cleo Serial Number with your software shipment.

Install the serial number(this step can be included with the previous cleoad function)

```
# /opt/sna/bin/cleoserial -w xxxxxx
  Where: xxxxxx is the Cleo 6 digit Serial Number
```

Please confirm that you want to change the Cleo SNA Serial Number
To the value

==> xxxxxx <==

?[y/n]

y

Display the serial number

```
# /opt/sna/bin/cleoserial -r
```

The Cleo SNA Serial Number has a value of

==> xxxxxx <==

Modify the serial number

```
# /opt/sna/bin/cleoserial -w yyyyyy
  Where: yyyyyy is the new Cleo 6 digit Serial Number
```

The Current Cleo SNA Serial Number has a value of

==> xxxxxx <==

Do you want to change the Serial Number
to the value

==> yyyyyy <==

?[y/n]

y

Configuring Cleo SNA Gateway - Ethernet

Installation of the Cleo SNA Gateway software and Unix Driver is now complete. You can utilize the ***x snaadmin*** GUI utility for configuring the SNA Gateway. (see the Cleo Administration Guide...section *Administration Tools*)

OR

You can configure the Cleo SNA Gateway software for 3270 sessions, using the "***snaconfig***" command line program. To configure, Edit the **SNA Ethernet CONFIGURATION TEXT** file (`/etc/opt/sna/snaeth.txt`) and then running the "***snaconfig***" program to update the Cleo SNA Software's configuration.

Running "*snaconfig*" after editing the SNA ETHERNET CONFIGURATION TEXT file

1. If the SNA Software is running, then Stop the SNA Software by entering the following command:

```
# /opt/sna/bin/sna stop
```

2. Edit the default SNA ETHERNET CONFIGURATION TEXT file (`/etc/opt/sna/snaeth.txt`) supplying your Host system's specific parameters. Note: See **Appendix E**. for a definition of the `snaconfig` Host Configuration Parameters in the **SNA ETHERNET CONFIGURATION TEXT** file. See **Appendix F**. for the file's default values.

3. Update the Cleo SNA Software's configuration using the following command:

```
# /opt/sna/bin/snaconfig -E          (where -E = ETHERNET)
```

4. As a result of running **`snaconfig -E`**, a utility script **`snastart`** is created in the `/opt/sna/bin` directory. Run the **`snastart`** utility, after starting the SNA Server, if you want to start up configured `sna3270` emulators in the background. If you run the Cleo utility **`cleostart_sna`**, (described in **Appendix A**), **`snastart`** will be run automatically by the **`cleostart_sna`** utility.
5. If this is a new installation, then go to the "**Starting Cleo SNA Server**" section.

6. If you are modifying an existing System configuration and need to restart the SNA Software, then enter the following command:

```
# /opt/sna/bin/sna start
```

7. If this is a new installation, then go to the "**Starting Cleo SNA Server**" section.
8. If you are modifying an existing System's configuration, and need to restart the SNA Software, then enter the following command:

```
# /opt/sna/bin/sna start
```

Starting Cleo SNA Server

The quickest way of starting Cleo SNA is to issue the following commands (assumes correct PATH... PATH=\$PATH:/opt/sna/bin:/opt/sna/bin/X11):

```
# sna start
# xsnaadmin
```

The *xsnaadmin* program is a Motif-based administrative program. It contains extensive on-line help which will guide you through setting up a configuration from scratch. (see the Cleo Administration Guide...section *Administration Tools*)

Or

Start Cleo SNA Server from the command line

```
# sna start
# snaadmin init_node
# snaadmin start_port,port_name=xxxx      (where xxxx is the name of
                                           the port... i.e.  ETSAPO)
# snaadmin start_ls,ls_name=xxxx        (where xxxx is the name of
                                           the Link Station... i.e.
                                           ETSAPO)
```

Run SNA3270

select the appropriate style file in the /etc/opt/sna directory for the number of SNA3270 sessions each user will use per each invocation of sna3270.

```
s3270-1.stu    = 1  sna3270 session per invocation
s3270-2.stu    = 2  sna3270 sessions per invocation
s3270-3.stu    = 3  sna3270 sessions per invocation
s3270-4.stu    = 4  sna3270 sessions per invocation
s3270-5.stu    = 5  sna3270 sessions per invocation
s3270-6.stu    = 6  sna3270 sessions per invocation
s3270-7.stu    = 7  sna3270 sessions per invocation
s3270-8.stu    = 8  sna3270 sessions per invocation
s3270-9.stu    = 9  sna3270 sessions per invocation
s3270-0.stu    = 10 sna3270 sessions per invocation
```

A sample execution of 1 SNA3270 session per single user invocation:

```
# sna3270 -s /etc/opt/sna/s3270-1.stu
```

A sample execution of 5 SNA3270 sessions per single user invocation:

```
# sna3270 -s /etc/opt/sna/s3270-5.stu
```

Cleo SNA Gateway Removal

1. Login in as *root*.
2. Terminate any running instances of the product by entering the following command:

```
# /opt/sna/bin/sna stop
```
3. Remove the Cleo SNA Gateway by entering the following commands:

```
# cleormv  
  
# pkgrm cleodocs  
  
# pkgrm cleosna
```
4. Perform an orderly shutdown(eg. **/etc/shutdown**) and reboot the system.

Appendix A – CLEO UTILITIES

The following utility scripts and programs are provided by Cleo Communications. They may be useful for automated kernel tuning, starting and stopping SNA and SNA3270 emulator, starting and stopping TN3270/TN5250 emulators, and obtaining SNA protocol traces. All of these Cleo utilities reside in the /opt/sna/bin or /opt/tn3270/bin directories.

1. The **sna_tune** utility can be used to automatically increase or decrease kernel tuning parameters. The kernel tuning parameter increases are intended to accommodate applications/HLLAPI using up to 256 LUs.
2. To automatically increase the SNA kernel tuning, run the following command:

```
# /opt/sna/bin/sna_tune INSTALL /etc/opt/sna/sna_tune.dat
```

Then reboot the system for the kernel tuning changes to take effect.
3. To automatically decrease the SNA kernel tuning, run the following command:

```
# /opt/sna/bin/sna_tune REMOVE /etc/opt/sna/sna_tune.dat
```

Then reboot the system for the kernel tuning changes to take effect.
4. The **tn_tune** utility can be used to automatically increase or decrease kernel tuning parameters. The kernel tuning parameter increases are intended to accommodate applications/HLLAPI using up to 256Us.
5. To automatically increase the TN3270/TN5250 kernel tuning, run the following command:

```
# /opt/tn3270/bin/tn_tune INSTALL /etc/opt/tn3270/tn_tune.dat
```

Then reboot the system for the kernel tuning changes to take effect.
6. To automatically decrease the TN3270/TN5250 kernel tuning, run the following command:

```
# /opt/tn3270/bin/tn_tune REMOVE /etc/opt/tn3270/tn_tune.dat
```

Then reboot the system for the kernel tuning changes to take effect.
7. The **cleostart_sna** utility can be used to start the SNA Server and all configured sna3270 emulators to run in the background. The utility first stops SNA and the emulators by running the **cleostop_sna** utility, and then starts the SNA Server by running /opt/sna/bin/sna start and then runs the /opt/sna/bin/snastart script that runs all the configured sna3270 emulators in the background. The **cleostart_sna** utility can be used to run automatically at system reboot time. The **cleostart_sna** utility is a script that resides in /opt/sna/bin, and can be modified to not run **cleostop_sna** automatically and/or only run selected sna3270 emulators.
8. The **cleostart_tn** utility can be used to start all the configured tn3270/tn5250 emulators to run in the background. The utility first stops all the tn3270/tn5250 emulators by running the **cleostop_tn** utility and then runs the /opt/tn3270/tnstart

script that runs all the configured tn3270/tn5250 emulators in the background. The **cleostart_tn** can be used to run automatically at system reboot time. The **cleostart_tn** utility is a script that resides in /opt/tn3270/bin, and can be modified to not run **cleostop_tn** automatically and/or only run selected tn3270/tn5250 emulators.

9. The **cleostop_sna** utility can be used to stop the SNA Server and all sna3270 emulator processes that are running. The utility makes sure that all sna3270 emulator processes are killed and all the shared memory and semaphore resources they used, are released.
10. The **cleostop_tn** utility can be used to stop all tn3270/tn5250 emulator processes that are running. The utility makes sure that all tn3270/tn5250 emulator processes are killed and all the shared memory and semaphore resources they used, are released. Additionally, **cleostop_tn** kills the tn3270/tn5250 license daemon and release all the shared memory and semaphore resources the tn3270/tn5250 license daemon was using. Then the tn3270/tn5250 license daemon is restarted. This insures that the tn3270/tn5250 licensed LU count is not compromised.
11. The **cleodotrace** utility can be used to create detailed SNA protocol traces in the /var/opt/sna directory. Specifically, the files created are /var/opt/sna/cleosna1.dmp and /var/opt/sna/cleosna2.dmp. Cleo SNA protocol tracing can be enabled by removing the # in front of the following statements in the /opt/sna/bin/cleostartsna script.

```
#$$SNABIN/snaadmin set_trace_file, trace_file_type = IPS,  
  dual_files =      YES, trace_file_size = 10000000, file_name =  
  $$SNAVAR/cleotrcl,      file_name_2      = $$SNAVAR/cleotrc2  
#$$SNABIN/snaadmin set_trace_type, trace_flags = ALL  
#$$SNABIN/snaadmin add_dlc_trace
```

Appendix B – Kernel Tuning

The following is information for Solaris to tune kernel parameters for 256 LUs Running applications/HLLAPI. Without doing Kernel Tuning, less than 10 LUs will be available for running applications/HLLAPI.

1. Added the following lines to the file `/etc/system` (after saving the original one to `system.old`):

```
set shmsys:shminfo_shmseg=12
set shmsys:shminfo_shmmni=376
set semsys:seminfo_semmni=310
set semsys:seminfo_semmns=610
set semsys:seminfo_semmnu=330
set semsys:seminfo_semmap=305
```

2. Reboot the system.

To check the value of a kernel parameter, issue the command

```
"sysdef -i | grep -i <name of parameter>"
```

For example,

```
# sysdef -i | grep -i semmap
305 entries in semaphore map (SEMMAP)
```

See the Solaris System Admin. Guide, Volume II for more information.

These are the values for 256 sessions if you require different numbers refer to the Cleo Installation Guide Chapter 4 for more information.

Appendix C – Host Configuration Information

Required Configuration Information:

Before you begin the installation and configuration process, contact your host personnel and get the following critical information about your connection.

Much of this information can be found in the NCP Gen on your mainframe host.

Line Type: (leased / dial up) _____

XID Type: (Format 0 / Format 3) _____

NRZ or NRZI _____

PU Address = _____

LOCADDR(s) or LU Number(s) = _____

MAXDATA = (265 – 4105) _____

IDBLK = _____

IDNUM = _____

TN3270/TN5250 Connection

If you are Planning to establish a TN3270(E)/TN5250 (TCP/IP) connection to your mainframe host please provide the following information:

IP address of the Mainframe host or TNSERVER
_____ - _____ - _____ - _____ and Port Number _____

Does the TNSERVER support TN3270 or TN3270E? _____

SNA Over LAN Connection (Ethernet)

If you are planning to access your host over an Ethernet connection please get the following information from your Network Administrator.

Remote MAC Address _____

System Information

What Operating System will you be running your Cleo software on?

AIX SCO SOLARIS UnixWare

What is the version of the operating system? _____

What hardware platform will the Cleo software be running on? _____

What version of Cleo Software will you be loading? _____

Is this a new install or an Upgrade? _____

What type of connection will you be using for communicating with the remote system?
(Ethernet / SDLC) _____

What Communication adapter card will you be using? _____

What is the model and manufacturer of the modem, modem eliminator or modem sharing
device that will be used for this connection?

Please provide diagram of the connection from the mainframe host to your network.
Include as much detail as possible.

Appendix D – TNCONFIG

TNCONFIG

The ***tnconfig*** command has the following options:
[-T **TERMTYPE**]

Optional parameter to specify a TN3270 Terminal Type to use. This sets the Environment Variable `_OVERRIDE_TN3270_TERM` to the value of **TERMTYPE**.

[-NE]

Optional parameter to override the default of using TN3270 Extentions Mode.

If **-NE** is specified, then negotiations with TN SERVERS will not use TN3270 Extentions.

-h hostname1,hostname2,...,hostnamen

Mandatory parameter.

Each comma separated argument is an /etc/hosts entry or DNS name entry that points to a TNSERVER.

There must be a corresponding **-n** argument for each **-h** Argument.

-n number lus for hostname1,number lus for hostname2,...,number of lus for hostnamen

Mandatory parameter.

Each comma separated argument is the number of LUs to use for the corresponding **-h** argument.

[-l 3270specificLUname1,3270specificLUname2,..., 3270specificLUnamen]

Optional parameter.

Each comma separated argument is a specific LU name for TN3270. There will be an entry for every LU on every host/TNSERVER connection.

[-t seconds]

WHERE: *seconds* is the number of seconds to delay before trying to re-connect an LU, when a host connection fails.

The environment variable

SNA3270_RETRY_TIME

is set to the value of the *seconds* argument.

Optional parameter. 5 seconds is the default value.

The environment variable

SNA3270_RETRY_TIME

is set to the value of the *seconds* argument.

[-a seconds]

WHERE: *seconds* is the number of seconds to use for DIP HLLAPI no-response from emulator failure value

Optional parameter. 1 second is the default value.

[-ssl 3|2]

Optional parameter.

Where 3 specifies to use Version 3.0 of SSL to negotiate the SSL connection to the TNSERVER.

Where 2 specifies to use Version 2.0 of SSL to negotiate the SSL connection to the TNSERVER.

If the **-ssl** parameter is **NOT SPECIFIED**, then SSL will not be used to connect to the TNSERVER.

[-cm RLE|ZLIB]**Optional parameter.**

Where **RLE** specifies to use RLE type SSL compression.

Where **ZLIB** specifies to use ZLIB type SSL compression.

[-cc PATHTOCLIENTCERTIFICATEFILE]**Optional parameter.**

The specific path and file name of the Client SSL Certificate File must be specified. The File must be in "**Privacy Enhanced Mail**" format. This certificate file will be used when negotiating a SSL connection to the TNSERVER.

[-ck PATHTOCLIENTKEYFILE]**Optional parameter.**

The specific path and file name of the File that contains the KEY to the Client SSL Certificate.

The KEY File must be in "**Privacy Enhanced Mail**" format.

This KEY File will be used when the SSL Certificate is accessed, during the negotiation of a SSL connection to the TNSERVER.

[-cp PATHTOKEYFILEPASSWORDFILE]**Optional parameter.**

The specific path and file name of the File that contains the password needed to access the SSL KEY file.

The password in the KEY File Password File is used when the KEY File is accessed, during the negotiation of a SSL connection to the TNSERVER.

APPENDIX E – *snaconfig* HOST CONFIGURATION PARAMETERS

The PARAMETERS defined in the "/etc/opt/sna/snasdsc.txt and /etc/opt/sna/snaeth.txt" file are:

NOTE: There should be NO spaces around the “=” signs in the /etc/opt/snaxxxx.txt files.

SNA_TYPE=S | E

Where **S** = SNA over SDLC
E = SNA over ETHERNET

PORT_NUM=1 | 2 | 3 | 4

Where **1** corresponds to

SDLCP0 for SDLC (note the Link Station will be **SDLCL0**)
ETSAP0 for Ethernet (note the Link Station will be **ETHL0**)

2 corresponds to

SDLCP1 for SDLC (note the Link Station will be **SDLCL1**)
ETSAP1 for Ethernet (note the Link Station will be **ETHL1**)

3 corresponds to

SDLCP2 for SDLC (note the Link Station will be **SDLCL2**)
ETSAP2 for Ethernet (note the Link Station will be **ETHL2**)

4 corresponds to

SDLCP3 for SDLC (note the Link Station will be **SDLCL3**)
ETSAP3 for Ethernet (note the Link Station will be **ETHL3**)

MAXDATA=dddd

Where **dddd** is the decimal value for MAXDATA

XIDS=0xnxxxxxxx

Where **xxxxxxx** is the 3 digit Hexadecimal **IDBLK** and 5 digit

Hexadecimal **IDNUM** to send to the Host

XIDR=0xnnnnnnnn

Where **nnnnnnnn** is the 3 digit Hexadecimal **IDBLK** and 5 digit Hexadecimal **IDNUM** to send to receive from the Host

LINE_TYPE=LEASED | SWITCHED (SDLC ONLY)

DUPLEX=HALF | FULL (SDLC ONLY)

ENCODING=NRZ | NRZI (SDLC ONLY)

CONSTANT_RTS=Y | N (SDLC ONLY)

POLL_ADDR=hh (SDLC ONLY)

Where **hh** is the 2 digit Hexadecimal Polling Address(eg. C1)

LOCAL_SAP=0xhh (Ethernet ONLY)

REMOTE_SAP=0xhh (Ethernet ONLY)

Where **hh** is the 2 digit Hexadecimal Remote **SAP**(Service Access Pt.)

MAC_ADDR=xxxxxxxxxxxx (Ethernet ONLY)

Where **xxxxxxxxxxxx** is the 12 digit Hexadecimal Remote Mac Address

LU_RANGE=x-y

Where **x** is the beginning LU Number and **y** is the ending LU Number(eg. 2-129)

SESSIONS=d

Where **d** is the total number of Session/LUs to use(eg. 128).

APPENDIX F - DEFAULT VALUES for SNA CONFIGURATION files

There is a Cleo CONFIGURATION text file supplied for each type of SNA connectivity.

The file /etc/opt/sna/snasd.c.txt contains the following default entries for

SNA over SDLC:

```
SNA_TYPE=S
PORT_NUM=1
MAXDATA=265
XIDS=0x05DFFFFFF
XIDR=
LINE_TYPE=LEASED
ENCODING=NRZ
CONSTANT_RTS=N
POLL_ADDR=C1
LU_RANGE=2-129
SESSIONS=129
CARD_TYPE=SPARC_HSI_PCI_SDL
```

The file /etc/opt/sna/snaeth.txt contains the following default entries for

SNA over ETHERNET

```
SNA_TYPE=E
PORT_NUM=1
MAXDATA=1929
XIDS=0x05DFFFFFF
XIDR=
LOCAL_SAP=04
REMOTE_SAP=04
MAC_ADDR=400000000000
FLIP=TRUE
LU_RANGE=2-129
SESSIONS=128
```

APPENDIX G – SUN HSI PCI ADAPTER

This Appendix contains hardware, software, and configuration information for installing and using a SUN HSI PCI Adapter with the Cleo SNA over SDLC Software.

HARDWARE ADAPTER INFORMATION

HSI/P Adapter – High Speed Serial Interface PCI bus Adapter 2.0. The adapter is a PCI card with a 4 RS-449 connector cable. The Sun product number is **X1355A-2**.

HSI/P DRIVER

The Driver can be found on the Solaris 8 and/or 9 Supplemental CD: for Solaris 8 **SunHSI_PCI_3.1**.

Or the Driver can be downloaded from the Sun website at www.sun.com.

From www.sun.com

Choose “Downloads”

Choose “Hardware Drivers”

Choose “HSI/P 3.1” from “Network Devices”

BLACK BOX CONVERTER

In order to connect RS 232 devices to the SUN HSI/P adapter, it is necessary to install an externally powered RS-449 to RS-232 interface converter to each DB-37 connector on which you intend to connect an RS-232 device.

Cleo has successfully used a Black Box Converter for testing in the Cleo Lab.

Contact information for the Black Box Converter is as follows:

Black Box Corporation

<http://www.blackbox.com>

<http://catalog.blackbox.com/blackbox/Templates/blackbox/mainscreen.asp>

A standalone Converter is available

Black Box Part Number: IC456A-R5

as well as a Rack Mount Card

Black Box Part Number: IC456C-R5

The HSI/P DB-37 is a female connector, as well as the RS-232 ports on the Black Box Converter. So a male to male connector converter will be needed as well.

Black Box Part Number: FA460

CLEO SDLC CONFIGURATION FOR THE HSI/P ADAPTER

The **HSI/P** adapter software comes with a utility program that can be used to setup SDLC connection parameters on the adapter. The utility program resides in the following location

/opt/SUNWconn/bin/hsip_init

However, it is not necessary to use the “**hsip_init**” utility, directly, since the Cleo “**snaconfig**” utility automatically calls the “**hsip_init**” utility to set the adapter parameters based on the parameters in the Cleo SDLC Configuration Text File(/etc/opt/sna/snasdcl.txt). The following parameter needs to set in order to have “**snaconfig**” automatically use the “**hsip_init**” utility.

CARD_TYPE=SPARC_HSI_PCI_SDLC

The Cleo “**snaconfig**” utility will use other parameters in the SDLC Configuration Text File to call the “**hsip_init**” utility with the correct arguments.

CONFIGURATION INFORMATION FOR A LEASED LINE CONNECTION**Black Box Converter**

Configure the RS-422 port for DCE, by placing DIP Shunts in

XW1B

XW2B

XW3B

Configure the RS-232 port for DTE, by placing DIP Shunts in

XW4A

XW5A

Cleo “snaconfig” Parameters in /etc/opt/sna/snasdcl.txt

SNA_TYPE=S

PORT_NUM=1

MAXDATA=NNN (NNN <= 2064 - depends on Host NCP GEN)

XIDS=0XXXXXXXX (XXXXXXXX – depends on Host NCP GEN)

XIDR=0YYYYYYYY (YYYYYYYY – depends on Host NCP GEN)

LINE_TYPE=LEASED

DUPLEX=HALF (or **FULL** – depends on Host NCP GEN & modem)

ENCODING=NRZ (or **NRZI** – depends on Host NCP GEN & modem)

CONSTANT_RTS=N (or **Y** if no other SDLC Host Connections use the Leased Line)

POLL_ADDR=PP (PP – hex polling address depends on Host NCP GEN)

LU_RANGE=2-nn (nn – number of licensed Sessions + 1)

SESSIONS=nn (nn – number of licensed Sessions)

CARD_TYPE=SPARC_HIS_PCI_SDLC

If using “hsip_init” utility directly the parameters to use would be

nrzi=no or yes (depending on NCP GE & Modem)
txc=rx
rxr=rx
txd=txd
rxr=txd
mode=ibm-hdx or ibm-fdx (depending on NCP GEN being half or full duplex)
signal=no or yes (depending on NCP GEN & modem being constant RTS or not)
mtu=2064
mru=2064
speed=xxxxxxx (depending on network capabilities. Default is 1536000)

CONFIGURATION INFORMATION FOR A DIALUP CONNECTION**Black Box Converter**

Configure the RS-422 port for DCE, by placing DIP Shunts in

XW1B**XW2B****XW3B**

Configure the RS-232 port for DTE, by placing DIP Shunts in

XW4A**XW5A****Cleo “snaconfig” Parameters in /etc/opt/sna/snasdlc.txt**

SNA_TYPE=S
PORT_NUM=1
MAXDATA=NNN (NNN <= 2064 - depends on Host NCP GEN)
XIDS=0xXXXXXXXX (XXXXXXXX – depends on Host NCP GEN)
XIDR=0xYYYYYYYY (YYYYYYYY – depends on Host NCP GEN)
LINE_TYPE=SWITCHED
DUPLEX=HALF (or FULL – depends on Host NCP GEN & modem)
ENCODING=NRZ (or NRZI – depends on Host NCP GEN & modem)
CONSTANT_RTS=N
POLL_ADDR=PP (PP – hex polling address depends on Host NCP GEN)
LU_RANGE=2-nn (nn – number of licensed Sessions + 1)
SESSIONS=nn (nn – number of licensed Sessions)
CARD_TYPE=SPARC_HIS_PCI_SDLC

If using “hsip_init” utility directly the parameters to use would be

nrzi=no or yes (depending on NCP GE & Modem)
txc=rx

```
rxc=rxc
txd=txd
rxd=txd
mode=ibm-hdx or ibm-fdx (depending on NCP GEN being half or full duplex)
signal=yes
mtu=2064
mru=2064
speed=1536000
```

DIALUP MODEM SETTINGS

DCD must be forced **HIGH**
CTS must follow **RTS**

DIALUP MODEM SETTINGS FOR MOTOROLA V.3220 UDS**Change Protocol Options**

LAPM Protocol = disabled
MWP Protocol = disabled
Buffer mode is direct
DTE Flow Control = RTS
DCE Flow Control = CTS
Xon/Xoff Passthrough = disable
Inactivity timer = off
Break option = 0
V.42 fast detect = disable

Change DTE Options

Sync Data
DTR controlled dialer
AT command set = disables
DTR disconnects change
DSR = forced HIGH
DCD = forced HIGH
CTS follows RTS
RTS-CTS delay is 0ms
DTE fallback = disabled