
How Do I Recover iNFINITI Remotes and Line Cards?

Date: June 26, 2008

Overview

This FAQ contains the following information and procedures pertaining to iDS Release 6.0.1 and later:

- Before Attempting to Recover
- Differences between iNFINITI and NetModem II+
- iNFINITI Series Recovery Procedures (to be completed in the following order):
 - *Procedure 1. Establishing Console Connectivity*
 - *Procedure 2. Loading Linux from Redboot*
 - *Procedure 3. Establishing IP Connectivity*
 - *Procedure 4. Reloading Image Software Package*
 - *Procedure 5. Reloading Options File*

Before Attempting to Recover

The following two steps must be completed on the connecting PC before beginning to recover an iNFINITI Remote or Line Card:

Before recovering an iNFINITI Remote or Line Card:

- 1 Create or obtain a good Options file for the iNFINITI, using a matching version of the iSite or iBuilder application.

Note: The Options file, at a minimum, must match the Model Type, Serial Number, Software Version, and Derived ID of the iNFINITI device being recovered.

- 2 Obtain the iDS iNFINITI Software Image package. The iDS release version must match that of the network. The software package(s) should be obtained from the Network Operator, and placed into one folder on the connecting PC. Network Operators obtain the software through their iDirect Technical Assistance Center (TAC) Support webpage login at <http://tac.idirect.net/software.asp>.

Note: For recovery of devices intending to use iDS version 7.1 or higher, the Cumulative Update package is also required.

Note: For recovery of 3100 Series Remotes intending to use iDS version 8.0.1, the Upgrade Prep package is required as well.

You must also have the following equipment:

- a rollover console cable or DB-9 to RJ-45 adapter
- a straight-thru Ethernet cable
- a terminal emulator (i.e. TeraTerm or HyperTerminal)
- the iSite software (or any TFTP server)

The following are optional applications which can be used for some procedures:

- PuTTY (or any Secure Shell client)
- WinSCP (or any Secure Copy client)

Differences between iNFINITI and NetModem II+

There are several distinct differences between the iNFINITI series and the NetModem II+ series images and Options files, necessitating different procedures. The NetModem II+ series uses a boot-loader to load the software and the Options file. The iNFINITI series runs on a custom built Linux operating system, so "breaking" into the boot loader is no longer required. When the iNFINITI boots up, it first loads the Linux operating system, which requires a login. The factory default login appears below:

```
iDirect login: root
Password: iDirect
```

Once logged into the Linux prompt, the iDirect application console is accessed by typing **telnet 0**, which results in another login prompt. This is the same application accessed when logging into the iNFINITI through the iSite and iBuilder software. The factory login for the application from this prompt appears below:

```
# telnet 0
Username: admin
Password: P@55w0rd!
```

Note: Some iNFINITI components can be shipped with the password of **iDirect** instead.

The iDirect application runs as a service called **idirect_falcon**. This service can be started, stopped, and restarted using the following command:

```
service idirect_falcon <command>
[command = start | stop | restart | status]
```

If you are unable to access the application using **telnet 0**, the service is not running and the software image and/or the Options file needs to be reloaded. The following procedures explain how to perform these reloading processes.

iNFINITI Series Recovery Procedures

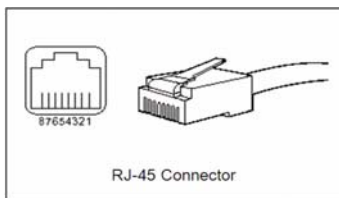
Recovering an iNFINITI device, which entails executing each of the five procedures presented in this document, is intended to restore full functionality to the malfunctioning iNFINITI device. These procedures resolve issues caused by corruption in the software, incorrect or forgotten passwords, mismatched Options files, and incorrectly configured interface properties. In the case of a malfunction, these procedures also help rule out these causes before proceeding with a Return Merchandise Authorization (RMA) request. Before requesting an RMA, these procedures should be executed to help avoid the fees associated with a "No Fault Found" RMA.

Note: If the following five (local) procedures are conducted sequentially, and any of these procedures fail to produce the expected outcome, request a Return Merchandise Authorization (RMA) by sending an email to the iDirect TAC at tac@idirect.net. Network Operators can create a RMA Service Request directly through the iDirect TAC Support webpage at <http://tac.idirect.net/>.

Procedure 1. Establishing Console Connectivity

This procedure describes how to establish a console connection between a PC and the iNFINITI Remote or Line Card. Any terminal emulator can be used with a console cable to connect to the iNFINITI console. The HyperTerminal application comes preinstalled on all Windows 2000 and XP machines, and is the emulator described in this procedure.

In addition to a terminal emulation application, a rollover console cable is needed. The straight-through Ethernet cable that is included with the iNFINITI devices can be joined to a DB9-to-RJ45 adapter to construct a console cable. The adapter pin-outs to construct the console cable using a straight-through Ethernet cable are presented in the following table:

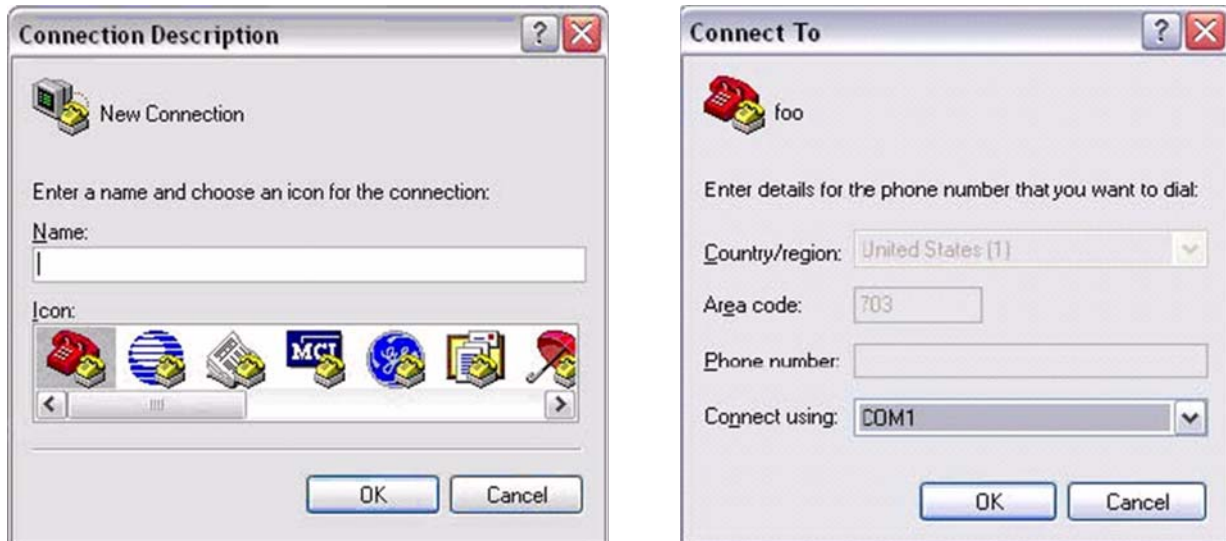


Console Port(DTE)	RJ-45 Pin	Color Code	RJ-45 to DB-9 Adapter Pin	Console Device
RTS	1	Blue	8	CTS
DTR	2	Orange	6	DSR
TxD	3	Black	2	RxD
GND	4	Red	NC	GND
GND	5	Green	5	GND
RxD	6	Yellow	3	TxD
DSR	7	Brown	4	DTR
Rx-RF-Power	8	White/Grey	9	--

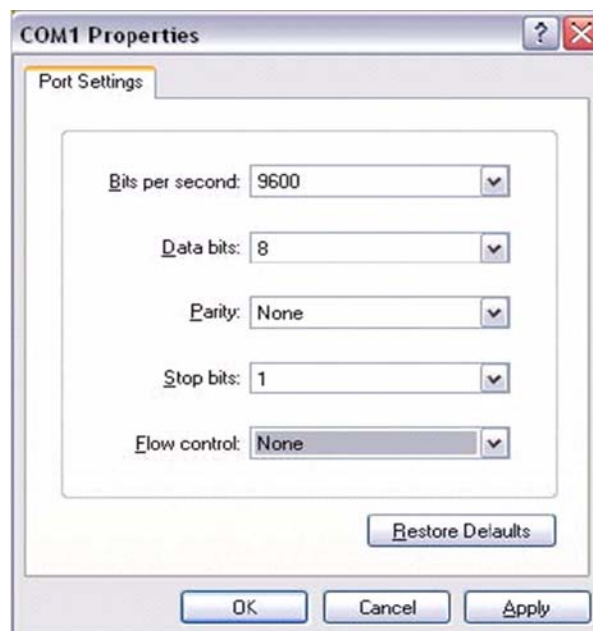
Complete the following procedure to set up and save a HyperTerminal session:

- 1 Connect the DB-9 end of the console cable to the COM port of the laptop, and the RJ-45 end of the cable into the Console port of the iNFINITI device.
- 2 In the Windows Start menu, select **Programs—>Accessories—>Communications—>HyperTerminal**.
- 3 In the Connection Description dialog box, enter a name for the connection, such as "iNFINITI Console."

Note: Area Code and Dialing Information might also be requested. The information entered for these fields is not important, but something must be entered.



- 4 In the Connect To dialog box, select COM1 in the Connect Using drop-down menu.
- 5 Fill in the Port Settings tab as shown below in the COM1 Properties dialog box.



Note: iNFINITIs configured for Serial GPS (Mobile), start using a bps rate of 4800 instead of 9600, once the Options file is auto-loaded after boot. In this case, it is normal to see an unintelligible display on the console if the boot load sequence is not interrupted.

- 6 Press Enter a few times to generate a response from the iNFINITI console.

Procedure 2. Loading Linux from Redboot

The following sequence of steps describes how to use the console connection to bypass the `root` password and manually load the Linux operating system kernel on an iNFINITI Remote or Line Card. These steps also describe how to change the `root` password.

Note: This procedure presupposes that *Procedure 1* has been completed, and therefore console connectivity has already been established.

To load Linux from Redboot:

- 1 Recycle the power on the iNFINITI unit.

The message `DRAM Test Successful` displays on the console.

- 2 Immediately press the spacebar 4 to 5 times, in order to interrupt the boot load sequence and enter RedBoot.

The `Redboot>` prompt displays.

- 3 Enter the following commands to load the Linux kernel:

```
fis load Linux
exec -c "root=/dev/mtdblock2 console=ttyS1,9600 single"
```

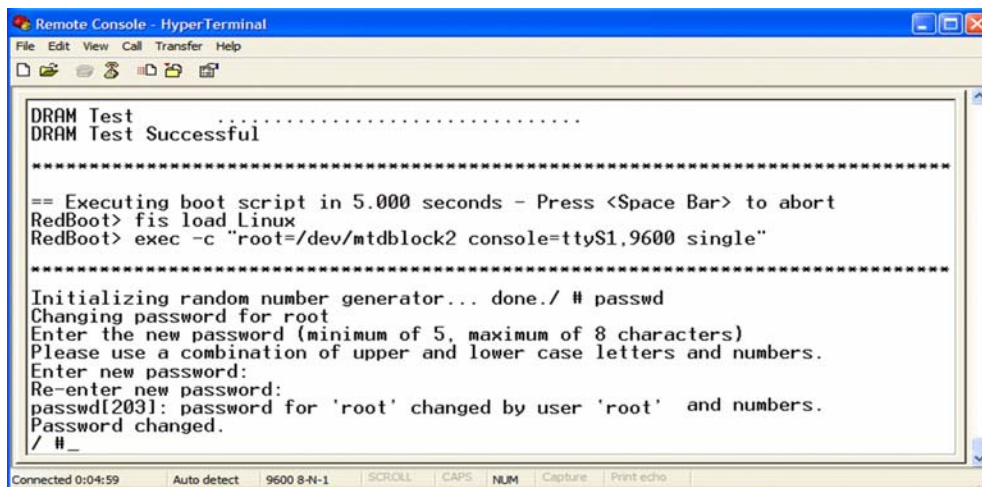
The `/#` prompt is displayed, indicating a login without password:

To change the root password:

- 4 Enter the following command:

```
passwd
```

- 5 Type a new password (`iDirect` is the default) and press `Enter`.
- 6 When prompted, enter the new password again to confirm.



```
Remote Console - HyperTerminal
File Edit View Call Transfer Help

DRAM Test .....
DRAM Test Successful

*****

== Executing boot script in 5.000 seconds - Press <Space Bar> to abort
RedBoot> fis load Linux
RedBoot> exec -c "root=/dev/mtdblock2 console=ttyS1,9600 single"

*****

Initializing random number generator... done./ # passwd
Changing password for root
Enter the new password (minimum of 5, maximum of 8 characters)
Please use a combination of upper and lower case letters and numbers.
Enter new password:
Re-enter new password:
passwd[203]: password for 'root' changed by user 'root' and numbers.
Password changed.
/ #_

Connected 0:04:59 Auto detect 9600 8-N-1 SCROLL CAPS NUM Capture Print echo
```

Procedure 3. Establishing IP Connectivity

This procedure describes how to use the console to establish IP and Secure Shell connectivity to the iNFINITI.

Note: This procedure presupposes that *Procedure 2* has been completed, and therefore console connectivity has been established, Linux has been loaded and logged into, and the `idirect_falcon` services are not running.

To determine iNFINITI unit IP Address and Subnet Mask:

- 1 At the `/#` Linux prompt, enter the following command to view the interface configurations:

```
ifconfig
```

The interface configurations are displayed.

- 2 Annotate what is displayed as the first interface (`ixp0` or `ixp1`); this information is needed in the following steps to configure the IP address and cabling.

What follows after the `inet addr` and `Mask` fields under the first listed interface is the iNFINITI unit's IP address and subnet mask.

- 3 If a valid/correct IP address and subnet mask were displayed in Step 1, skip to Step 4. If a valid IP address and subnet mask is not present, configure it by entering the command:

```
ifconfig <interface> <ip address> netmask 255.255.255.0
```

where:

`interface` = `ixp0` or `ixp1` (as noted in Step 2)

`ip address` = desired address (192.168.0.1, for example)

Note: Changing the IP address using this method is temporary; it will be overwritten by the IP address configured in the Options file when the file is read, which occurs during reboot at the end of this document.

- 4 Enter the following command again, to confirm the interface configurations:

```
ifconfig
```

Note: Anotate what is now displayed as the IP address (`inet addr`) of the first interface; this information is needed in later procedure steps.

- 5 Turn on the SSH daemon by entering the following console command:

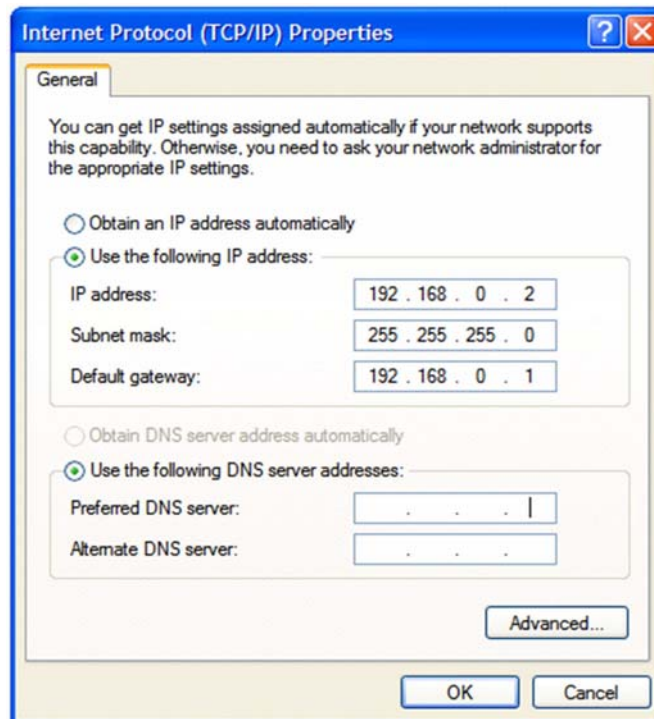
```
service sshd start
```

To configure PC interfaces for iNFINITI subnets:

- 6 Using a crossover cable, connect the PC's Ethernet interface to the iNFINITI unit's LAN A port, if the interface annotated in Step 2 was `ixp0`. If the interface annotated in Step 2 was `ixp1`, connect to the iNFINITI unit's LAN B interface instead.

Note: A straight-thru cable can be used for this step if the PC's interface supports Auto-MDI/MDIX sensing (this is the case with most laptops).

- Using the Windows Internet Protocol (TCP/IP) Properties dialog box, configure the PC's Default gateway to match the iNFINITI's IP address, and the PC's IP address to be in the same subnet. For example, if the iNFINITI's IP address and Subnet mask (noted in Step 4) are 192.168.0.1 and 255.255.255.0, a correct configuration for the PC would appear as shown in the following screen image:



Note: Annotate the IP address configured for the PC in case this information is needed later in the procedure.

- From the Windows Command Prompt, verify IP connectivity by successfully pinging the iNFINITI unit's IP address:

```
ping <ip address>
```

where:

ip address = iNFINITI unit's IP address (as noted in Step 4)

Procedure 4. Reloading Image Software Package

The following procedure uses the console and iSite's TFTP Server application to reload the iNFINITI unit's Image Software Package. Alternative *Procedure 4b*, which follows this procedure, can be used instead to reload the Image Software Package remotely.

Note: This procedure presupposes *Procedure 3* has been completed, with console connectivity established, Linux has been loaded and logged into, the `idirect_falcon` services are not running, and IP connectivity has been established.

To reload the Image Software Package using TFTP:

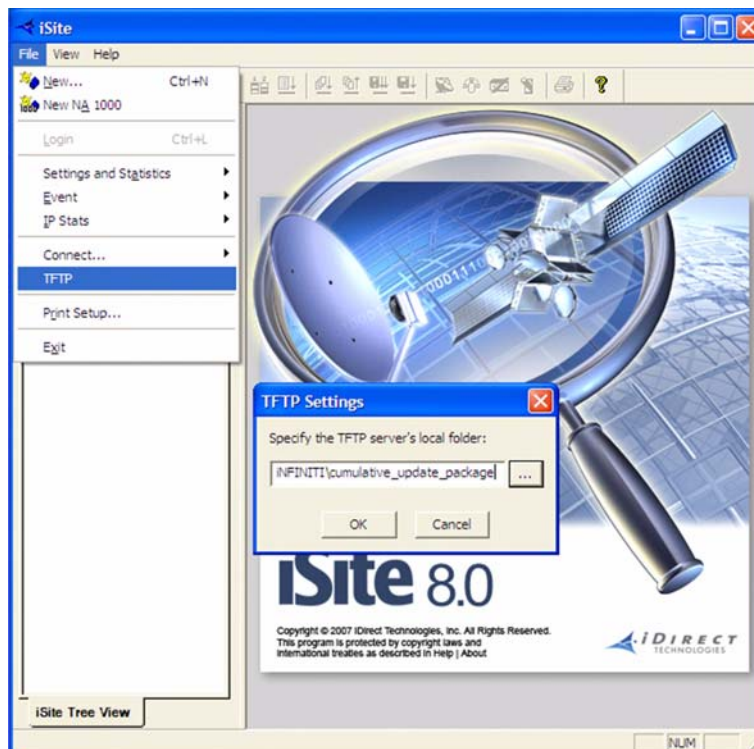
- 1 Enter the following commands from the console to increase the swap-space in the `/tmp` directory:

```
df
mount -t tmpfs -o remount,size=16M /tmp
df
```

- 2 To use the TFTP Server included with iSite:
 - a Close any open sessions of iSite
 - b Launch a new session of the iSite application
 - c Select File—>TFTP

The TFTP Settings dialog box displays.

- 3 Browse and select the folder on the PC containing the iNFINITI package file(s) and click OK when complete.



- 4 If loading iDS version 8.0.1 onto a 3100 Series Remote, continue to Step 5. If not, skip to Step 6.

To install the Upgrade Prep package:

- 5 To start the installation of the Upgrade Prep package file, enter the following command at the Linux prompt:

```
tftp_package.sh <ip address> remote-8_0_upgrade_prep.pkg
```

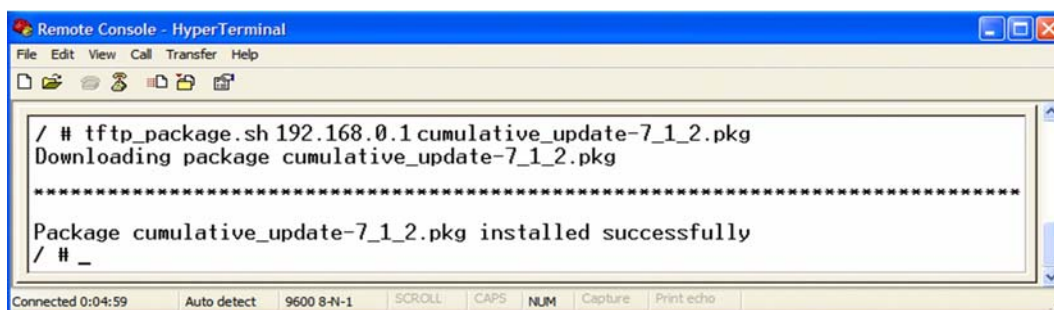
where:

ip address = address of TFTP server (PC) (as noted in Step 7 of *Procedure 3*)

For example, if the IP address of the PC is 192.168.0.2, the command is as follows:

```
tftp_package.sh 192.168.0.2 remote-8_0_upgrade_prep.pkg
```

Note: If a **tftp: timeout** error message displays, close iSite, ensure any other running iSite applications are closed, and return to Step 1.



- 6 If loading an iDS version 7.1 or higher, continue to Step 7 to install the Cumulative Update package. If not, skip to Step 8.

To install the Cumulative Update package:

- 7 To start the installation of the Cumulative Update package file, enter the following command at the Linux prompt:

```
tftp_package.sh <ip address> cumulative_update-X_Z_Y.pkg
```

where:

ip address = address of TFTP server (PC) (as noted in Step 7 of *Procedure 3*)

X_Y_Z = 7_1_1 thru 8_Y_Z (iDS release)

For example, if the IP address of the PC is 192.168.0.2 and loading iDS 7.1.2, the command is:

```
tftp_package.sh 192.168.0.2 cumulative_update-7_1_2.pkg
```

Note: If a **TFTP: timeout** error message displays, close iSite, ensure any other running iSite applications are closed, and return to Step 1.

To install the Software Image package:

- 8 Enter the following command at the Linux prompt:

```
tftp_package.sh <ip address> <device-X_Y_Z.pkg>
```

where:

ip address = address of TFTP server (PC) (as noted in Step 7 of Procedure 3)

device = hub | remote (type of iNFINITI package)

x_y_z = 6_0_1 thru 8_X_X (iDS release)

For example, if the IP address of the PC is 192.168.0.2 and iDS 7.1.2 is being loading, the command is as follows:

```
tftp_package.sh 192.168.0.2 remote-7_1_2.pkg
```

Note: If a **TFTP: timeout** error message displays, close iSite, ensure any other running iSite applications are closed, and return to Step 1.

To verify the successful installation the Software Image package:

- 9 Enter the following command at the Linux prompt:

```
/usr/sbin/falcon --version
```

- 10 If the correct iDS version is displayed, proceed to *Procedure 5. Reloading Options File*. If not, proceed to *Procedure 4b. Reloading Image Software Package Remotely*.

Procedure 4b. Reloading Image Software Package Remotely

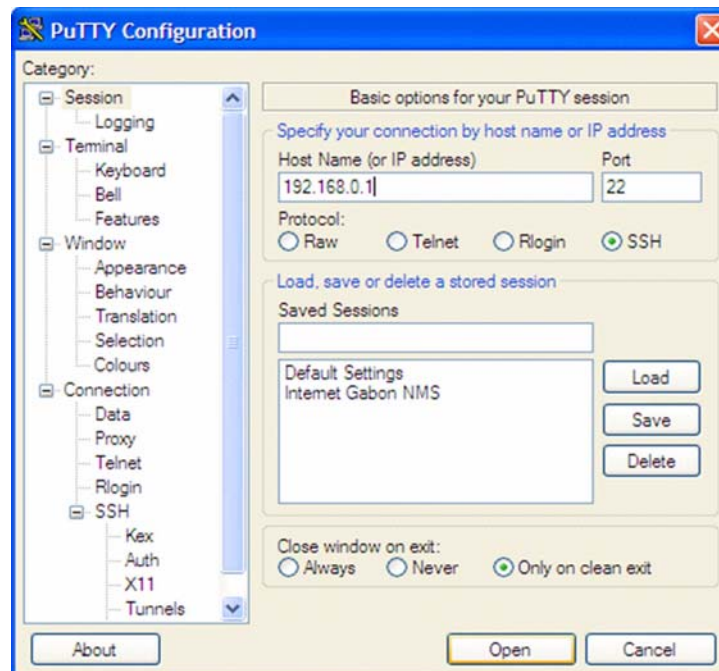
The following procedure is a remote alternative to *Procedure 4*, which describes how to reload a Software Image package remotely using WinSCP and a Secure Shell session. This procedure requires that the WinSCP application be installed on the connecting PC, and that *Procedure 3* has been completed successfully.

Note: This a remote alternative to *Procedure 4*, and presupposes that *Procedures 3* has been completed. Therefore, the Linux kernel has been loaded from RedBoot and logged into, the `idirect_falcon` services have not been started, the SSH daemon is running, and LAN-side IP connectivity has been established.

Note: WinSCP is an open-source SFTP client for Windows that offers secure file transfer between a local and remote computer. It can be downloaded by accessing <http://winscp.net/eng/index.php>.

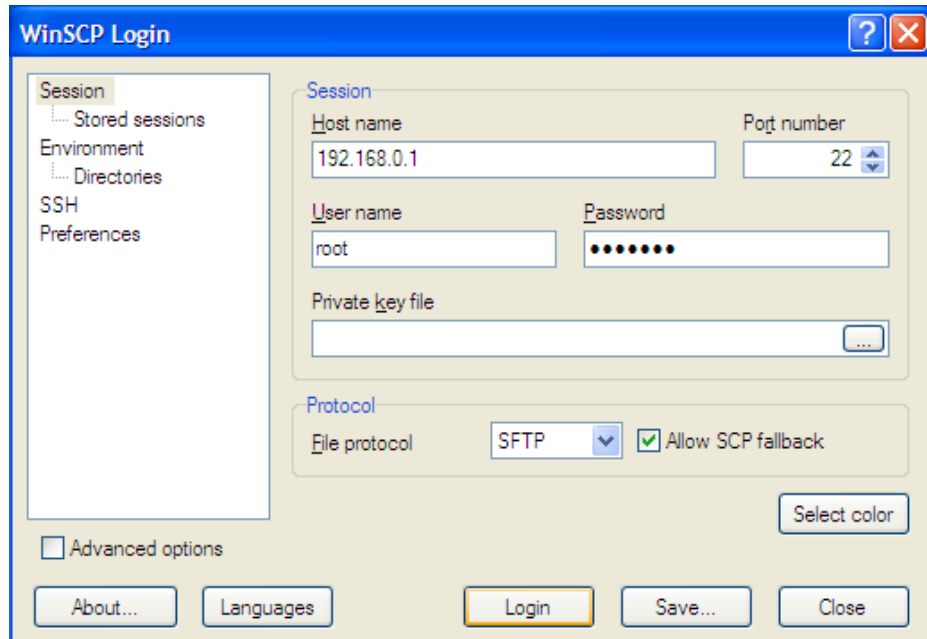
To establish a Secure Shell session:

- 1 Launch the Secure Shell client (i.e. PuTTY) on the PC.
- 2 Using the iNFINITI unit's IP address, as noted in Step 4 of *Procedure 3*, and the root Login, establish an SSH session between the SSH client and the iNFINITI unit.



To establish a WinSCP session:

- 3 Launch the WinSCP client on the connecting PC.
- 4 Enter the IP address of the iNFINITI (as noted in *Procedure 3, Step 3*) in the **Host Name** field, and enter the root login credentials for the Username and Password. Click the "Login..." button.



- 5 If loading iDS version 7.1 or higher, Secure Copy the Cumulative Update package file, named as shown below, from the PC into the **/tmp** directory on the iNFINITI. If not, skip to Step 4.
`cumulative_update-X_Z_Y.pkg`
where:
`X_Y_Z` = 7_1_1 thru 8_X_Y (iDS release)
- 6 Secure Copy the Software Image package file from the PC into the **/tmp** directory on the iNFINITI.
`device-X_Y_Z.pkg`
where:
`device` = hub | remote (type of iNFINITI package)
`X_Y_Z` = 7_1_1 thru 8_X_Y (iDS release)
- 7 In the Secure Shell session, move to the **/tmp** directory by enter the following command:
`cd /tmp`
- 8 Enter the following commands at the console prompt to increase the swap-space in the **/tmp** directory:
`df`
`mount -t tmpfs -o remount,size=16M /tmp`
`df`

Note: With the introduction of the iNFINITI product line, the software packages can consume a large portion of the allocated flash. Before you proceed with extracting the image package, it is necessary to temporarily increase the swap space with the command in the next step.

Swap space can be increased with the `mount` command:

Note: The `df` command above displays the current usage of the allocated disk space, (in the `/tmp` directory, in this example). Once the swap space is added with the `mount` command, the percentage drops allowing the software package to fully extract.

- 9 If loading iDS version 7.1 or higher, proceed to Step 10. If not, skip to Step 11.
- 10 Enter each of the following commands exactly as shown to extract and install the Cumulative Update package:

```
package -mx -a cumulative_update-X_Y_Z.pkg
rm -f cumulative_update-X_Y_Z.pkg
chmod 744 package_install.sh
./package_install.sh
```

where:

`X_Y_Z` = 7_1_1 through 8_Y_Z (iDS release, as Secure Copied in Step 5)

- 11 Enter each of the following commands exactly as shown to extract and install the Software Image package:

```
package -mx -a device-X_Y_Z.pkg
rm -f device-X_Y_Z.pkg
chmod 744 package_install.sh
./package_install.sh
```

where:

`device` = hub | remote (type of iNFINITI package)

`X_Y_Z` = 6_0_1 thru 8_Y_Z (iDS release, as Secure Copied in Step 6)

Example command input (and display response) for reloading the image package:

```
# pwd
/tmp
# ls -al

drwxrwxrwt 2 root root 60 Jan 1 04:53
drwxr-xr-x 1 root root 0 Jan 1 01:07
-rw----- 1 root root 2369688 Dec 8 2005 remote-6_0_9.pkg

# df
# mount -t tmpfs -o remount,size=16M /tmp
# df
# package -mx -a remote-6_0_9.pkg
# rm -f remote-6_0_9.pkg
# chmod 744 package_install.sh
# ./package_install.sh

*****Package installation script for falcon starts HERE*****
```

Procedure 5. Reloading Options File

The following procedure uses the console to reload the Options file locally. This procedure copies the text of the Options file to the clipboard on the PC, and then pastes it into an Options file on the iNFINITI unit console. In certain circumstances, the Options file can instead be reloaded remotely using WinSCP. For more information, see alternative *Procedure 5B*.

Note: This procedure presupposes *Procedure 4* has been completed, console connectivity has been established, Linux has been loaded and logged into, the `idirect_falcon` services are not running, and the iNFINITI is using a valid, uncorrupted software image.

To reload the Options file:

- 1 Open the good Options file in a text editor (i.e. Notepad) and copy all of the text to the Windows clipboard.
- 2 On the console, move to the Options file directory by entering the following command:

```
cd /etc/idirect/falcon/
```

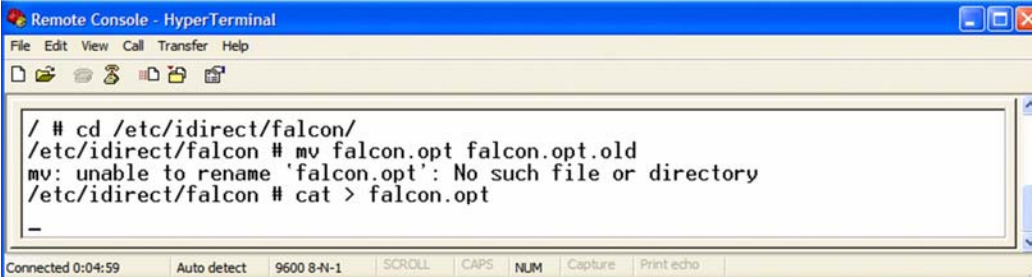
- 3 Rename the current Options file by entering the following command:

```
mv falcon.opt falcon.opt.old
```

Note: A `no such file or directory` error displays if there is no existing Options file.

- 4 Enter the following command to create, and enter text into, a new Options file:

```
cat > falcon.opt
```

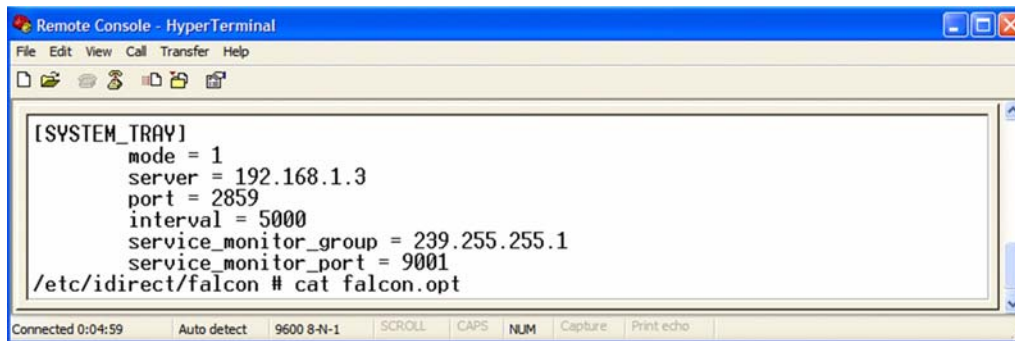


The screenshot shows a HyperTerminal window titled "Remote Console - HyperTerminal". The terminal output displays the following commands and their results:

```
/ # cd /etc/idirect/falcon/  
/etc/idirect/falcon # mv falcon.opt falcon.opt.old  
mv: unable to rename 'falcon.opt': No such file or directory  
/etc/idirect/falcon # cat > falcon.opt  
-
```

The status bar at the bottom of the window indicates "Connected 0:04:59", "Auto detect", "9600 8-N-1", "SCROLL", "CAPS", "NUM", "Capture", and "Print echo".

- 5 Move the mouse cursor to the location of the console cursor, and right-click to paste the text previously copied (in Step 1) into the console session.
- 6 Press `Enter` once, and then press `Ctrl-D` to exit.



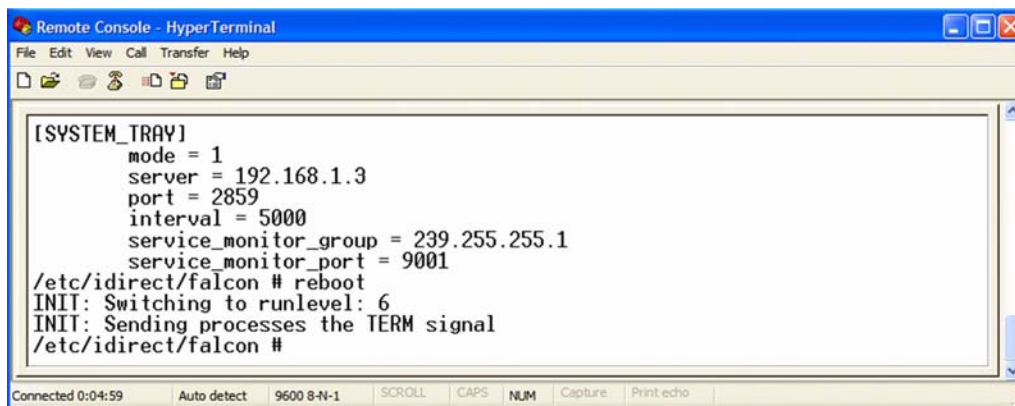
```
Remote Console - HyperTerminal
File Edit View Call Transfer Help
[SYSTEM_TRAY]
mode = 1
server = 192.168.1.3
port = 2859
interval = 5000
service_monitor_group = 239.255.255.1
service_monitor_port = 9001
/etc/idirect/falcon # cat falcon.opt
```

- 7 Examine the contents at the end of the `falcon.opt` file, ensuring no extra characters were inserted, by entering the following command:

```
cat falcon.opt
```

- 8 Reboot the iNFINITI unit, by entering the `reboot` console command:

```
reboot
```



```
Remote Console - HyperTerminal
File Edit View Call Transfer Help
[SYSTEM_TRAY]
mode = 1
server = 192.168.1.3
port = 2859
interval = 5000
service_monitor_group = 239.255.255.1
service_monitor_port = 9001
/etc/idirect/falcon # reboot
INIT: Switching to runlevel: 6
INIT: Sending processes the TERM signal
/etc/idirect/falcon #
```

Note: After the iNFINITI unit has completed its reboot cycle, the iDS version and Options file can be verified by entering the following commands at the Linux prompt:

```
/usr/sbin/falcon --version
```

```
cat /etc/idirect/falcon/falcon.opt
```

Procedure 5b. Loading an Options Files Remotely

This procedure is an alternative to *Procedure 5*, which can be used to load an Options file remotely. This procedure uses a Secure Shell session and WinSCP to reload the iNFINITI unit's Options file, and requires that WinSCP be installed on the PC.

Note: WinSCP is an open source SFTP client for Windows that offers secure file transfer between a local and remote computer. It may be downloaded by accessing <http://winscp.net/eng/index.php>.

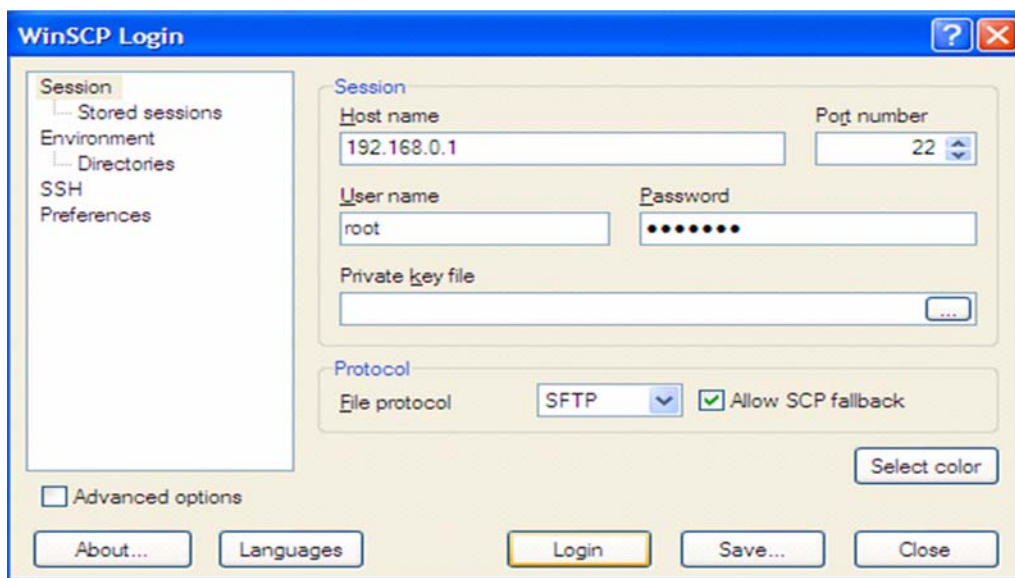
Note: This is a remote alternative to *Procedure 5*, and may not be successful unless *Procedures 1-4* have been completed locally. This procedure requires that LAN-side IP connectivity has been established on the iNFINITI unit, Linux has been loaded and logged into, the Secure Shell daemon is running, and a valid and uncorrupted software image is operating.

To establish a Secure Shell session:

- 1 Launch the Secure Shell client (i.e. PuTTY) on the PC, and using the iNFINITI unit's IP address (noted in Step 4 of *Procedure 3*), establish an SSH session with the iNFINITI.
- 2 Login to the SSH session with the iNFINITI using the root user login.

To load an Options file using WinSCP:

- 3 Rename the good Options file on the local PC to `falcon.opt`.
- 4 In Windows, launch the WinSCP application, and login to a session using the default WinSCP session parameters, the configured iNFINITI IP address (noted in Step 4 of *Procedure 3*), and the root user login.



- 5 Using the WinSCP session, navigate to the `/etc/irect/falcon/` directory on the iNFINITI. If there is an existing file there, named `falcon.opt` (precisely), left-click the file and rename it `falcon.opt.old`.
- 6 Using the WinSCP session, drag-and-drop to secure copy the `falcon.opt` Options file (renamed in Step 3) to the following location on the iNFINITI unit:
`/etc/irect/falcon/`
- 7 Using the WinSCP session, navigate to the `/etc/irect/falcon/` directory on the iNFINITI, and ensure the Options file copied in the previous step is still named **`falcon.opt`** and not **`falcon.opt.opt`**. If not, change the file name to **`falcon.opt`**.
- 8 Enter the **`reboot`** command at the iNFINITI unit console:
`reboot`