Software Updating

Teldat-Dm 748-I

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Chapter 1 Introduction

1.1 Introduction

Our routers execute software known as C.I.T. . This is made up of various elements:

- **BOOT**

  This is a small start up program recorded in a read-only device. Loss of this program is practically impossible and it also permits you to recoup a device in extreme cases. This element cannot be updated via software.

- **BIOS FLASH**

  Consists of the basic interface with the router hardware providing the C.I.T. with a more abstract view of this. In this way, the variations produced in the hardware (e.g. changing the integrated circuit used to control PSTN) are transparent to the C.I.T..

- C.I.T.

  This is the part of the code which handles the internetworking processes (IP routing, X.25, IPSec, ATM, etc) as well as the configuration and monitoring console. This is also known as "application".

- Auxiliary Files (*.BFW, *.UPG, ...)

  To simplify our modular routers updating as well as reducing the size of the C.I.T., determined blocks are provided as isolated files. The need for these depends on the available hardware. E.g., our devices support various ADSL chipsets and depending on the type of chipset available in your device, will need one firmware (BFW, UPG) or another.

- Image file(*.img)

  In some devices, the BIOS, C.I.T. and FWs are distributed in a single file with extension img.

The process of updating our router software consists in substituting one or several of the previously mentioned elements. This manual explains all available options for the updating process.

1.2 How the Software is distributed

The router software is made up of various elements. In order to correctly execute updating to a determined version, you need all the archives that make up this version. In order to simplify version management and avoid errors, the router software is distributed in what we call **distributions**: a distribution consists of a **TGZ** file (TAR + GZIP) which contains all the archives required in order to update a device to a determined version, i.e. BIOS FLASH application(s) and auxiliary files are distributed in separate files; or an image file (extension img) which contains all the above.

Choosing the TGZ system guarantees content integrity and coherence at the same time as permitting management through standard tools.

> **Note**
>
> If a device is updated through a mixture of different distribution archives, this may disable the device. Should this occur, the updating process will have to be executed by first starting up the device from the BOOT, with the corresponding loss of information, configurations etc.

> **Note**
>
> We only guarantees compatibility to upgraded versions: i.e. provided you update your device to a more modern version, the device will run correctly, respecting the configuration; in cases where you update your device to an earlier release than the one being executed by the device, the device may not start up and it will be necessary to carry out updating from BOOT.

> **Note**
>
> Firmware upgrade files (*.UPG) are provided on demand and are used to upgrade the firmware embedded in some DSL cards, WWAN modules, etc..

In devices whose software distribution contains the BIOS, C.I.T. and FWs as separate files, the various archives are internally stored in the device Flash memory which the user sees as a traditional disk unit: all the files except the BOOT and BIOS FLASH are loaded in the files system over the said Flash memory, and can be deleted, renamed etc., and of course, the said disk can be consulted, formatted and filled up preventing new files being recorded.

In devices whose software distribution contains an image file (extension img), this file is internally stored in a partition of the flash reserved for the said image and not in the files system where the configuration and the rest of the data handled by the CIT usually resides.

> **Note**
>
> Please bear in mind that the code permitting the device to run is stored in the Flash memory. Any operation over this should be analyzed before being carried out as this may leave the device inaccessible and consequently may need to be restarted from BOOT.

During the updating process, access to the device console may be needed; the serial port configuration is as follows:

```
Speed: 9600 bps
Eight data bits
One stop bit
No parity bit
No type of flow control
```

1.2.1 Distribution format and content

There are various distributions which generally represent different hardware platforms; e.g. there is a distribution for mobility devices supporting Teldat H1 Automotive, Teldat H1 Rail or Teldat H2 Automotive ; there is another distribution for industrial devices that support the Regesta models, etc.

1.2.1.1 Distribution with BIOS, C.I.T. and FWs files

The distribution name is variable, this however permits you to easily identify the devices to which this is destined and the corresponding version:

• The first part indicates to which devices this is destined.

• The second part indicates the version (two digit groups must be executed).

ROUTERMODEL_XXYYZZ.tgz

```
Routermodel: name of device
XXYYZZ: version XX.YY.ZZ
```

A sample distribution contains the following archives:

bxxxx.bin	fw000009.bfw
device_name.bin	fw00000a.bfw
fw000000.bfw	fw00000c.bfw
fw000001.bfw	fw00000d.bfw
fw000002.bfw	fw000012.bfw
fw000003.bfw	fw000013.bfw
fw000004.bfw	version_map.txt
fw000005.bfw	mibs.tgz
fw000006.bfw	dictionary.txt
fw000007.bfw	els.rtf
fw000008.bfw	vXXYYZZ.md5
readme.txt	

The readme.txt" archive provides information on the distribution content as well as basic updating instructions; in this example:

```
DISTRIBUTION FILE CONTENTS
bxxxx.bin              BIOS 04.02
device_name.bin        C.I.T. version 11.00.04
```

```
fw000000.bfw          Alcatel-SGS Thomson DynaMiTe ADSL over POTS v2.0.2
fw000001.bfw          MindSpeed ZipWirePlus SHDSL v2.4.2
fw000002.bfw          Analog Devices Eagle ADSL over POTS v2.1.2
fw000003.bfw          Analog Devices Eagle ADSL over ISDN Annex B v4.1.2
fw000004.bfw          Alcatel-SGS Thomson DynaMiTe ADSL over ISDN v2.0.2
fw000005.bfw          VoIP Audiocodes AC48xx v3.12.9.2
fw000006.bfw          VoIP Audiocodes AC48xx v3.0.2
fw000007.bfw          VoIP Audiocodes AC49x v1.0.8.21.2
fw000008.bfw          Conexant Titanium Ultra Plus ADSL2+ v3.1.2
fw000009.bfw          PMC ADSL2+ Conexant Titanium Ultra Plus + PQ2SAR processor firmware v4.1
fw00000a.bfw          MIP firmware v1.0.2
fw00000c.bfw          VoIP Audiocodes AC48xx v3.12.9.2
fw00000d.bfw          Conexant Orion SHDSL v3.0
fw000012.bfw          Broadcom 6328 TSS STANDARD v3.8
fw000013.bfw          Broadcom 63268 TSS STANDARD v3.9
fw000014.bfw          Broadcom 63268 ISDN TSS STANDARD v3.9
fw000015.bfw          Lantiq Socrates 4E + PQ2 TSS-mode v2.2


version_map.txt       Help file for the selection of the suitable .bin for your device


mibs.tgz              MIB files and MIBS_Finder application


dictionary.txt        Radius Dictionary extensions


els.rtf               Event Logging System Manual


vXXYYZZ.md5           MD5 checksum of binary files
```

1.2.1.2 Distribution with the C.I.T. image file

There are devices whose software distribution contains the BIOS, C.I.T. and FWs in a single file with extension img which is known as a C.I.T. image. This applies, for example, to the Regesta devices, whose software distribution contains the following files:

cit-c1pl_tesa-10.08.02.img	cit-c1pl_tesa-10.08.02.img.md5
mibs.tgz	dictionary.txt
version_map_tc1plusl.txt	readme.txt

The distribution name is variable; however it's easy to determine the devices this is destined for and the corresponding version:

ROUTERMODEL_XXYYZZ.tgz

```
Routermodel: name of device
XXYYZZ: version XX.YY.ZZ
```

The same thing happens with the C.I.T. image file name; this allows you to easily determine the devices this is destined for and the corresponding version:

router-model-XX.YY.ZZ.img

```
Routermodel: name of device
XXYYZZ: version XX.YY.ZZ
```

The "readme.txt" file provides information on the distribution content as well as basic updating instructions: as in this example:

```
DISTRIBUTION FILE CONTENTS
*****************************************************************************
name-device-XX.YY.ZZ.img             C.I.T.
*****************************************************************************
mibs.tgz                             MIB files and MIBS_Finder application
dictionary.txt                       Radius Dictionary extensions
els.rtf                              Event Logging System Manual
```

```
name-device-XX.YY.ZZ.img.md5         MD5 checksum of image name-device-XX.YY.ZZ.img
version_map_namedevice.txt           Help file for the selection of the suitable .img for your device
```

In cases where a profile doesn't appear in the distribution and the C.I.T. image name, this means that the version is the default one or the standard and can be seen in the readme.txt file.

Chapter 2 Updating Process

2.1 Distribution with BIOS, C.I.T. and FWs files

2.1.1 Updating from BOOT

In cases where your device does not have a BIOS FLASH available (Flash memory is corrupted due to incorrect up-
dating, formatting etc.) the system will automatically start up the BOOT program; also a forced startup from BOOT
may be required if the BIOS FLASH is present but is corrupt and consequently cannot successfully start: in this latter
case, set all the microswitches to the OFF position with the exception of switch "**2**" or "**b**" and the device will pause in
BOOT.

> **Note**
>
> "All-OFF / 2-ON" combination forces startup from BOOT. The normal status for the microswitches is
> "All-OFF".

> **Note**
>
> Only activate startup from BOOT when absolutely essential.

The BOOT process automatically stops and ONLY permits downloading of the BIOS FLASH archive: load the
"bios.bin" archive found in the distribution through any of the methods offered by BOOT.

> **Note**
>
> In releases prior to 01.02.00, BOOT is exactly the same as BIOS FLASH; in this case you need to stop
> the startup process when two symbols ">" appear on the console followed by a number of increasing "."
> symbols, through the "CTRL.-T" key combination.

```
Current production date: xx xx
Current software license: xx xxxxx
S/N: xxx/xxxxx
BIOS MAC Add: xx-xx-xx-xx-xx-xx
>>
...
    === INITIAL  MENU ===

  a) Change Time
  b) Change Date
  c) Change Code to Run
  d) Change Licence
  f) Disk menu
  g) Set default name for file loaded from console
  h) Change BIOS licence
  l) Load from lan
  sc) show configuration file name
  s) Set temporary licence
  u) Unset temporary licence
  v) Change version control for loading
  w) Change default ethernet device
  x) Load from console (xmodem)
  r) Reset
  0) Exit
     >>
```

Once the transfer has been executed, deactivate microswitch "2" and reboot the system in order to execute BIOS
FLASH; continue with the updating process as if you had started from BIO FLASH.

2.1.1.1 Loading a file through XModem

In various phases of the updating process you can use the XModem protocol to transfer a file to the router via the configuration port, commonly known as console, which consists of an asynchronous serial line with a transfer speed limited to 115200 bps. The XModem is available in the majority of terminal emulators (**HyperTerminal**, **Tera Term** , etc.), the version used by the routers is XModem with CRC testing version.

Bear in mind that the storage device behaves as a disk; the name used to record the transferred file via XModem depends on various factors:

• In BIOS FLASH releases prior to 01.07.00, this is recorded with the name configured when transferred.

• In BIOS FLASH releases 01.07.00 or later, files considered as critical (CIT and firmware) are recorded with predefined names independently of the configured file name (the system recognizes the file and records it with the appropriate name). This behavior can be deactivated; however we strongly suggest that you do not. This can cause updating malfunction or the device may not start up if it is not carried out correctly. Files not considered critical are recorded with the configured name.

> **Note**
>
> The BIOS FLASH file is stored in a special form and does not appear in the system files system; therefore the send name and the recording name are unsubstantial.

To execute a transfer via the XModem protocol, carry out the following steps:

(1) Select the "x" option in the router (loading via XModem).

(2) A message will appear on the device console giving information on the name used to record the file being sent (this name is not applied in cases of critical files provided that the default behavior has not been modified). If this name is incorrect, press the key combination indicated on the console to change it. Contrariwise, wait for the next message.

(3) A message will appear on the device console giving information on the protocol and speed to use. If the speed is incorrect, press any key and select the correct speed. Contrariwise, wait for the next message.

(4) A message will appear on the device console giving information on the protocol and speed at which the transfer is produced. Check that LED 1 begins to flash in orange and LED 6 remains green.

(5) Initiate the transfer (the steps to carry out depend on your terminal emulator).

The various load process phases are reflected in the status of the LEDs:

State	LEDs
Idle	All LEDs (except the ON) are off.
Waiting	Led 1 slowly flashing in orange. Led 6 in green.
Receiving	Led 1 rapidly flashing in orange. Led 6 in green.
Recording	Led 1 slowly flashing in orange. Leds 5 and 6 in green.
Recording finalized	Leds 1, 5 and 6 in green.
Error	Led 1 in red. Leds 5 and 6 in green. (Generally due to lack of space in the Flash disk).

2.1.1.2 Loading a file through CARGA_LAN

In the various updating process phases, you can use Teldat's own protocol known as **CARGA_LAN** to transfer a file towards a router through the Ethernet interface. You will find a program in the documentation CD supplied with your router allow you to use the CARGA_LAN protocol. The CARGA_LAN protocol permits you to transfer at speeds higher than those used by protocols using the configuration port, reducing the time required for this.

Bear in mind that the storage device behaves as a disk; the name used to record the transferred file via CARGA_LAN depends on various factors:

• In BIOS FLASH releases prior to 01.07.00, this is recorded with the sent file's original name.

• In BIOS FLASH releases 01.07.00 or later, files considered as critical (CIT and firmware) are recorded with pre-

defined names independently of the sent file name (the system recognizes the file and records it with the appropriate name). This behavior can be deactivated; however we strongly suggest that you do not. This can cause updating malfunction or the device may not start up if it is not carried out correctly. Files not considered critical are recorded with the original name (without including the path).

> ☞ **Note**
>
> The BIOS FLASH file is stored in a special form and does not appear in the system files system; therefore the send name and the recording name are unsubstantial.

To execute a transfer via the CARGA_LAN protocol, carry out the following steps:

(1) Execute the CARGA_LAN program and select the file you wish to transfer (this program permits you to consecutively transfer various files).

(2) Select the "l" option in the router (*lower case L*)

(3) Check that LED 1 is flashing in orange and the router returns a message indicating the MAC address to be configured in the CARGA_LAN program.

(4) Configure the MAC address, initiate the transfer, wait and check the messages that will appear on the device console and the CARGA_LAN program progress bars.

The various load process phases are reflected in the status of the LEDs:

State	LEDs
Idle	All LEDs (except the ON) are off
Waiting	Led 1 slowly flashing in orange, the following message appears on the console: "Waiting for LAN loading…"
Receiving	Led 1 rapidly flashing in orange (flashing may be almost imperceptible given the high rate of reception).
Recording	Led 1 in orange, the following message appears on the console: "Saving file on flash..."
Recording finalized	Leds 1 in green, the following message appears on the console: "OK xx.x seconds."
Error	Led 1 in red, an explanatory message appears on the console.
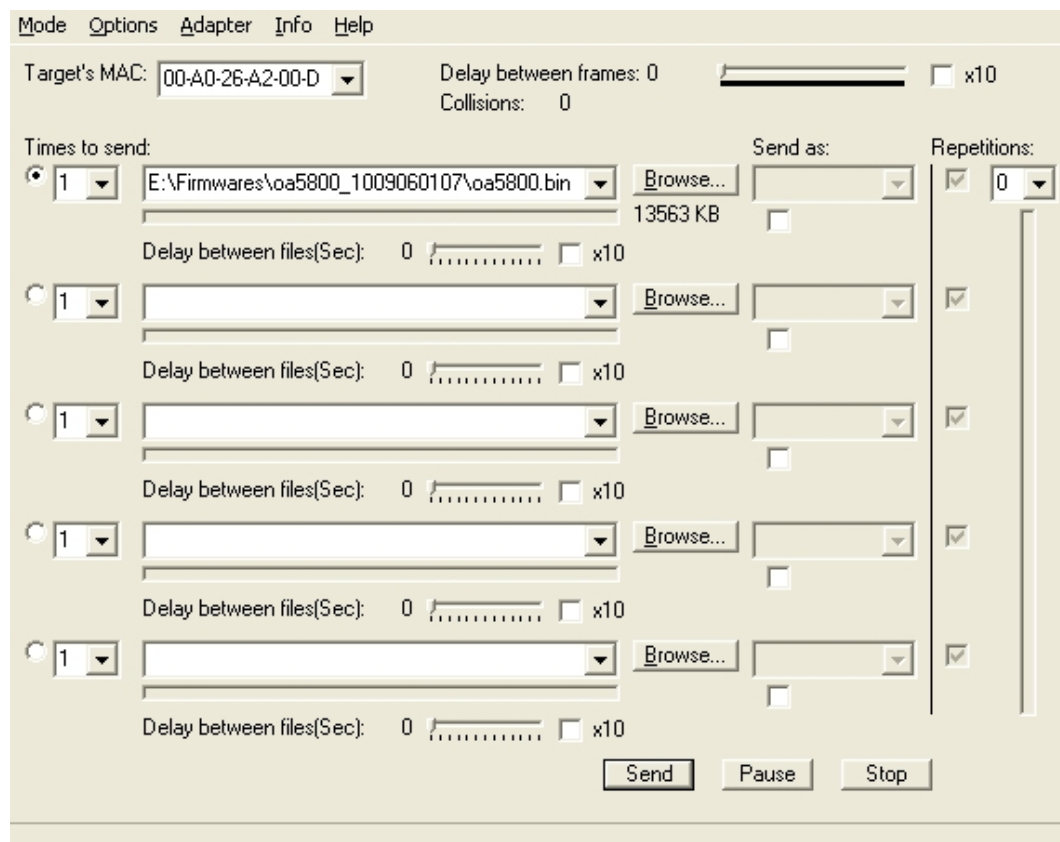
Fig. 1: Aspect of the CARGA LAN program

2.1.2 Updating from BIOS FLASH

This method should be used when you wish to update a device that won't startup correctly or because it doesn't have FTP access.

To access the BIOS FLASH menu, pause the device's normal startup through the "CTRL.-T" key combination when the device dumps a series of periods after two ">" symbols on the console.

```
**************************************************
**************************************************
**************************************************
BIOS CODE DUMP....................
BIOS DATA DUMP....
End of BIOS dump
FLASH BIOS CODE VERSION: 02.01  Apr  5 2013 15:59:21   L1
Current date: Aug 04 2010, Wednesday   Current time: 14:04:10
System Info:
PCB:0x129 GPPORCR:0x00290000 PVR:0x80212051 SVR:0x80EC0011
CLKs: CCB=396000 CPU0/1=792000/792000 DDR(clk)=330000 LBUS=49500 PCI0/1=0/0
Watchdog:Enabled
MMU Mode:Dynamic
ICache:ON DCache:ON Write-Back L2Cache:ON
Mem Info:
DRAM size: 512 Megabytes
   BANK 0: 512 Megabytes (detected)
FLASH: 65024 KB.
NVRAM: 128 KB.
EEPROM: 2048 Bytes.
Devices:
GIGABIT ETHERNET 1
GIGABIT ETHERNET 2
SWITCH(8) 10/100
SECURITY ENGINE
PCI device: PowerPC processor, RC
  (Bus: 0, Device: 0, Function: 0)
  (Vendor: 0x1957, Device: 0x0100)
  (Subs. Vendor: 0x0000, Subs. Device: 0x0000)
PCI device: PowerPC processor, RC
  (Bus: 10, Device: 0, Function: 0)
  (Vendor: 0x1957, Device: 0x0100)
  (Subs. Vendor: 0x0000, Subs. Device: 0x0000)
Current production date: 11 37
Current software license: XX XXXX
S/N: XXX/XXXXX
BIOS MAC Add: XX-XX-XX-XX-XX-XX
>>
......
     === INITIAL  MENU ===
  a) Change Time
  b) Change Date
  c) Change Code to Run
  d) Change Licence
  f) Disk menu
  g) Set default name for file loaded from console
  h) Change BIOS licence
  l) Load from lan
  sc) show configuration file name
  s) Set temporary licence
  u) Unset temporary licence
  v) Change version control for loading
  w) Change default ethernet device
  x) Load from console (xmodem)
  r) Reset
  0) Exit
     >>
```

Once you have accessed the menus system, you need to update all the necessary archives through whichever pro-

cess you prefer to use (see Procedure to send files.):

- BIOS FLASH (bios.bin contained in the distribution).
- C.I.T.

> In cases where the distribution provides various binary files, the "readme.txt" file, together with the hardware and license information on your device (this information can be found on the label on the underside of the device) will help to find out which file is required.

- Auxiliary Files.

> To determine the necessary files, you need to know what hardware your device contains and check the "readme.txt" file.

If you either want to change the Flash memory partitioning to activate or deactivate the backup system, or because the file system in Flash is corrupt, you need to format the Flash disk before loading the files; please see appendix *Flash Backup System* on page 22 where formatting is explained.

2.1.3 FTP Updating

Our routers have an FTP server to which files for device software updating can be transferred. This server is only accessible if the device has started up correctly (application being executed).

The steps to execute updating are as follows:

(1)   Extract the distribution content to a directory; if this is successful, the content will not have been altered.

(2)   Connect to the device FTP server (you need a user and a password; default is user "root" without a password).

(3)   Configure the binary mode through the "**bin**" command.

(4)   Transfer the BIOS FLASH through the "**put bios.bin**" command.

(5)   Once the transfer has finalized, execute the recording command through "**quote site savebuffer**"

(6)   Transfer the application through the "**put < application.bin >**" command.

> a) If the distribution includes various binaries, please see appendix *Information required for updating* on page 27 to determine the appropriate binary.
>
> b) If the application being executed is a 10.00.02 release or later, the name the application is sent with is not used for the recording; the device detects that it is an application file and records it with the appropriate name. With previous releases, you need to record the file with the current file name, in cases where this does not exist, use "appcode1.bin"
>
> c) Under certain circumstances, the transfer command may fail because the device does not have enough free volatile memory. In this case, activate the direct mode through the "**quote site direct on**" command before carrying out the transfer and deactivate it as soon as the said transfer has finalized through "**quote site direct off**". Direct mode is when the file being transferred is directly stored in the Flash memory instead of in the temporary buffer before recording. If you have a high speed connection, you will see that the transfer is carried out in bursts with pauses when recording is being executed in the Flash memory.

```
ftp> put sample.bin
200 PORT is set to IP ADDR = 172.24.51.52  PORT = 1221
150 Data connection open, file transfer in process...
###############################################################
###############################################################
###############################################################
###############################################################
###############################################################
###############################################################
############################
550 Error writing file.
2088960 bytes sent in 3,25 seconds (641,77 Kbytes/sec)
ftp> quote site direct on

200 DIRECT mode is set to ON.
ftp> put sample.bin appcode1.bin

200 PORT is set to IP ADDR = 172.24.51.52  PORT = 1222
150 Data connection open, file transfer in process...
```

```
################################################################
################################################################
################################################################
################################################################
################################################################
################################################################
################################################################
################################################################
#####################
226 STOR completed, 2708352 bytes processed, data connection is closed.
2708352 bytes sent in 50,59 seconds (53,53 Kbytes/sec)
ftp> quote site direct off
200 DIRECT mode is set to OFF.
ftp>
```

(7) Once the transfer has completed, execute the recording command "**quote site savebuffer**" (this is unnecessary if direct mode has been used).

(8) One by one transfer and store the required firmware (files with ""bfw" extension) through the " **put <firmware.bfw>**" and "**quote site savebuffer**" commands. In order to determine the necessary firmware, please see appendix *Information required for updating* on page 27.

(9) Finally and optionally, there is a command that permits you to check if the device has all the required files and if the elements versions are coherent with each other.

```
ftp> quote site coherence
550-COHERENCE results
  CIT          v10.1.0 ID 0x00000002
  BIOS         v1.7.0
  fw000000.bfw file not found!
  fw000002.bfw v1.1
550 COHERENCE results end
ftp>
```
You can also check the integrity of a file by calculating its MD5 signature and contrasting it with that included in the distribution .md5 file.

```
ftp> quote xmd5 fw000008.bfw
250 f94acab0c2a16b63ec8a5fe65262f5f1
ftp>
```

(10) Restart the device through the "quote site reload on"; if this is normally through FTP, the device will restart after 30 seconds; if this is through FTP the device will restart immediately using "CTRL.-C". You can also restart the device using the console command "**load immediate**"

```
*load immediate
Are you sure to reload the device(Yes/No)?
```

For further information on FTP commands, see section *Loading a file through FTP* on page 21 (found further on in this manual).

For further information on the FTP server, please see manual *Teldat-Dm 724-I* "*FTP Protocol*" .

> **Note**
>
> There are commands in the FTP protocol, which due to their nature, take a considerable time to execute. Given this, some FTP clients decide to close the connection when they do not receive a response in an established time believing that there has been a problem with the server, as has occurred with the Windows FTP client. Specifically, this client has a non configurable 60 second time-out between the sending of a command and the reception of the response: when this time-out expires, the client understands that the session is closed.
>
>
>
> If this situation occurs, please see manual *Teldat-Dm724-I* "*FTP Protocol*" .

2.1.4 TFTP Updating

Our routers have a TFTP client through which you can transfer files to/from a TFTP server. This client can only be accessed if the device has started up correctly (application in execution).

> **Note**
>
> Updating through TFTP means that no check is carried out regarding the versions, internal CRC, co-herency, renaming, etc., and should only be used when well aware of the risks of an erroneous updat-ing. We recommend that updating is carried out through FTP.

The steps to take to execute an updating are as follows:

(1) Extract the distribution content in a subdirectory from the root directory managed by the TFTP server; if the ex-traction is successful, then you have some guarantees that the content has not undergone any changes.

(2) Transferring the BIOS FLASH; to do this you need to activate the BIO files system and download the BIOS file (in our example, the BIOS file is known as b8260.bin and is located in the "new" TFTP server subdirectory, ad-dress 192.168.0.2; in cases regarding the BIO file system, as this only contains one file, the recording name is not important.).

```
TFTP+syst BIO
Current file system set to BIO
TFTP+get 192.168.0.2 new\bpx020.bin
Receiving new\bpx020.bin from 192.168.0.2...
   524288
File successfully received
```

(3) Transferring the application; to do this you need to activate the DSK file system and download the application file: if the distribution includes various binaries, please see appendix *Information required for updating* on page 27 to determine the appropriate binary. So the file loaded through TFTP executes on the next device start up, the name of the recording given to the TFTP client must coincide with the name of the active application that can be configured through "set application-active". Obviously, if the name of the recording coincides with a file stored in Flash, this will be overwritten (and if this coincides with the name of the active application, the loaded version will become the active one in the next start up).

```
Config>set application-active
 Date         Time          Size      Name
--------------------------------------------------------------------
 02/22/07     17:49       1655168     APPCODE1.BIN
 02/26/07     12:28       1655168     G.BIN
Current code filename : appcode1.bin
Application to activate [appcode1.bin]?
Code changed successfully
TFTP+syst DSK
Current file system set to DSK
TFTP+get 192.168.0.2 new\sample.bin appcode1.bin
Receiving appcode1.bin from 192.168.0.2\new\sample.bin...
  13889408
File successfully received
```

(4) Transferring the necessary firmware (files with extension "bfw"): to do this you need to activate the DSK file sys-tem and execute the download. To determine the necessary firmware, please see appendix *Information re-quired for updating* on page 27.

```
TFTP+syst DSK
Current file system set to DSK
TFTP+get 192.168.0.2 new\fw00000c.bin
Receiving new\fw00000c.bin from 192.168.0.2...
   155168
File successfully received
```

(5) Restart the device with the "**load immediate**" console command.

```
*load immediate
Are you sure to reload the device(Yes/No)? y
```

For further information on the TFTP client, please see manual *Teldat-Dm 765-I* "*TFTP Protocol*" .

2.2 Distribution with the C.I.T. Image file (IMG)

2.2.1 Updating from BOOT

In cases where your device doesn't have a valid C.I.T. image available (Flash memory corrupt due to wrong updating or the unit has been formatted, etc), the system will automatically start up the BOOT program; it also might be necessary to force start up from BOOT if the C.I.T. image is there but is corrupt and incapable of successfully starting.

> **Note**
>
> Only activate start up from BOOT if it's absolutely essential.

2.2.1.1 Loading the file through TFTP (you need a connection to a local console)

You must have a local connection to the device console to access the BOOT menu. For further information on this please see the corresponding installation manual for the device. The steps to carry out to load the C.I.T. image file are as follows:

(1) **Accessing the BOOT menu from the console.** To do this you need to simultaneously press the CTRL and T keys during the start up process when the text "***Press CTRL+T to stop DHCP and break into CFE menu ***" or "Press CTRL+T to stop auto run (X seconds)***"; appears, and before the indicated seconds run out. In this way the C.I.T. start up cancels and the device pauses at the BOOT prompt: " **CFE>**". From this menu, you can access all the BOOT menu commands. Below you can see an example of a C1+L start up:

```
CFE version 1.0.37-102.9-01 for BCM96358 (32bit,SP,BE)
Build Date: Thu Dec  3 11:02:34 CET 2009 (jsirodey@orion)
Copyright (C) 2000-2008 Broadcom Corporation.

Parallel flash device: name AM29LV320MT, id 0x2201, size 16384KB
CPU type 0x2A010: 300MHz, Bus: 133MHz, Ref: 64MHz
CPU running TP0
Total memory: 67108864 bytes (64MB)
Boot Address 0xbe000000

Board IP address                : 192.168.1.1:ffffff00
Host IP address                 : 192.168.1.100
Gateway IP address          :
Run from flash/host (f/h)       : f
Default host run file name      :
Default host flash file name    :
Boot delay (0-9 seconds)        : 3
Boot image (0=latest, 1=previous) : 0
Board Id (0-0)                  : 96358C1PL
Number of MAC Addresses (1-32)  : 4
Base MAC Address                : 00:a0:26:6e:00:58
PSI Size (1-64) KBytes          : 24
Main Thread Number [0|1]        : 0

DHCP running
*** Press CTRL+T to stop DHCP and break into CFE menu ***
*** Press CTRL+T to stop auto run (3 seconds) ***
Auto run second count down: 3
web info: Waiting for connection on socket 0.
CFE>
```

(2) **Check the IP configuration for the device and the TFTP server where the image file resides** . By default, the device has its own IP address configured, 192.168.1.1 with mask 255.255.255.0 and IP address for the TFTP server is 192.168.1.100. You can change the configuration through the "c" command. Please see the following example where the IP address for the device has been configured as 192.6.2.23 with mask 255.255.255.0 and the IP address for the TFTP server as 192.6.2.50

```
CFE> c
Press:  <enter> to use current value
        '-' to go previous parameter
        '.' to clear the current value
        'x' to exit this command
Board IP address                 : 192.168.1.1:ffffff00  192.6.2.23:ffffff00
Host IP address                  : 192.168.1.100  192.6.2.50
Gateway IP address          :
Run from flash/host (f/h)        : f
```

```
Default host run file name        :
Default host flash file name      :
Boot delay (0-9 seconds)          :  3
Boot image (0=latest, 1=previous) :  0
DHCP running
*** command status = 0
CFE>
```

(3) **Connect the device to the TFTP server.** Through the Ethernet cable provided with the device, with a direct connection between the router's LAN1 port and the TFTP server Ethernet port or through an intermediate switch or hub.

(4) **Prepare the TFTP server**. Configure the IP address the device expects and decompress the distribution content in a root directory subdirectory managed by the TFTP server. In the example the selected directory is "sample_codes".

(5) **Start the C.I.T. image file transfer**. Execute the "f" command followed by the name of the image file you wish to load; in our example this is name-device-xx.xx.xx.img. Once the transfer has finalized, the file will begin to be saved in Flash. Wait until the device tells you that it has finished doing this: *** Image flash done *** !

```
CFE> f sample_codes/name-device-xx.xx.xx.img
Loading 192.168.1.100:sample_codes/name-device-xx.xx.xx.img ...
Finished loading 6204416 bytes
Flashing root file system and kernel at 0xbe160000: ..................................
*** Image flash done *** !
Resetting board...
```

(6) The device restarts automatically once the updating has finished.

The loading process executes the following checks:

• **CRC check**: The CRC is calculated before starting to save to flash. In cases where the check proves to be incorrect, an error message appears and the updating stops:

```
CFE> f sample_codes/name-device-xx.xx.xx_badcrd.img
Loading 192.168.1.100:sample_codes/name-device-xx.xx.xx_badcrd.img ...
Finished loading 6204419 bytes
 Illegal image ! Image crc failed.
*** command status = -1
CFE>
```

• **C.I.T. version check:** when you try and update the device with a version which is prior to the one currently loaded, the device will pause and ask if you really want to execute this operation. The message that appears is shown below:

```
CFE> f sample_codes/name-device-10.08.01-boot-01.img
Loading 192.168.1.100:sample_codes/name-device-10.08.01-boot-01.img ...
Finished loading 6241536 bytes
Code version(10.08.01) is older than current(10.08.02). Continue?
 (y/n):
```

> 👆 **Note**
>
> We do not recommend that you load versions prior (downgrade) to the one currently loaded in the device. The configuration may be incompatible with the version you're trying to load.

• **Compatibility with the BOOT version check**: when you try to update the device with a C.I.T. image which is incompatible with the currently loaded BOOT version, the device will pause and ask if you really want to execute this operation. The message that appears is shown below:

```
CFE> f sample_codes/name-device-xx.xx.xx-boot-02.img
Loading 192.168.1.100:sample_codes/name-device-xx.xx.xx-boot-02.img ...
Finished loading 6241920 bytes
Image is incompatible with boot code 01. Boot needed: 02. Continue?
 (y/n):
```

> 👆 **Note**
>
> We do not recommend that you load C.I.T. versions that are incompatible with the BOOT version. It's possible that the device won't operate correctly.

• **Other checks**: the BOOT executes another series of checks to verify the integrity and compatibility of the image

you are trying to load.

- Compatibility with the hardware.

- Size compatibility.

2.2.1.2 Loading the file through WEB (connection to a local console isn't required)

In this case, we do not need a local connection to the device console:

(1) **Make the device start up in BOOT mode**. This process depends on the device model. You need to consult the corresponding section in the installation manual. We are going to take the C1+L device as our example:

- Turn off the device.

- Press the RST pushbutton, hold it down and switch on the device.

- The WLAN LED will begin to flash. Keep the RST pushbutton held down.

- After about 15 seconds, the WLAN LED goes out; keep the RST pushbutton held down.

- After about 3 seconds, the WLAN LED lights up. Release the reset button at this point.

- Wait for a few seconds until the device completes start up.

- The device is now in BOOT mode with the default IP configuration from BOOT (IP address 192.168.1.1 and mask 255.255.255.0).

(2) **Connect the device to a PC (any PC that has a browser).** Through the Ethernet cable provided with the device, with a direct connection between the router's LAN1 port and the HTTP client Ethernet port or through an intermediate switch or hub.

(3) **Prepare the PC**. Configure the IP address in the same network as the device.

(4) **Start a browser with the device IP address**: The following screen appears:
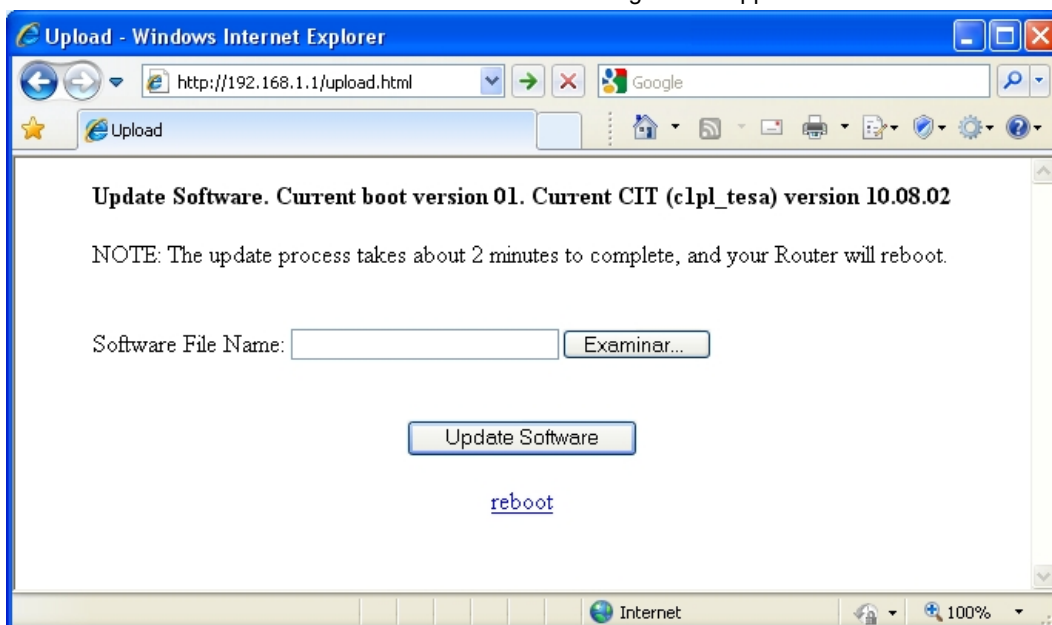
(5) **Select the image to load and click on "Update Software".** Click on "Examine" and select the C.I.T. image to load. Subsequently click on "Update Software".
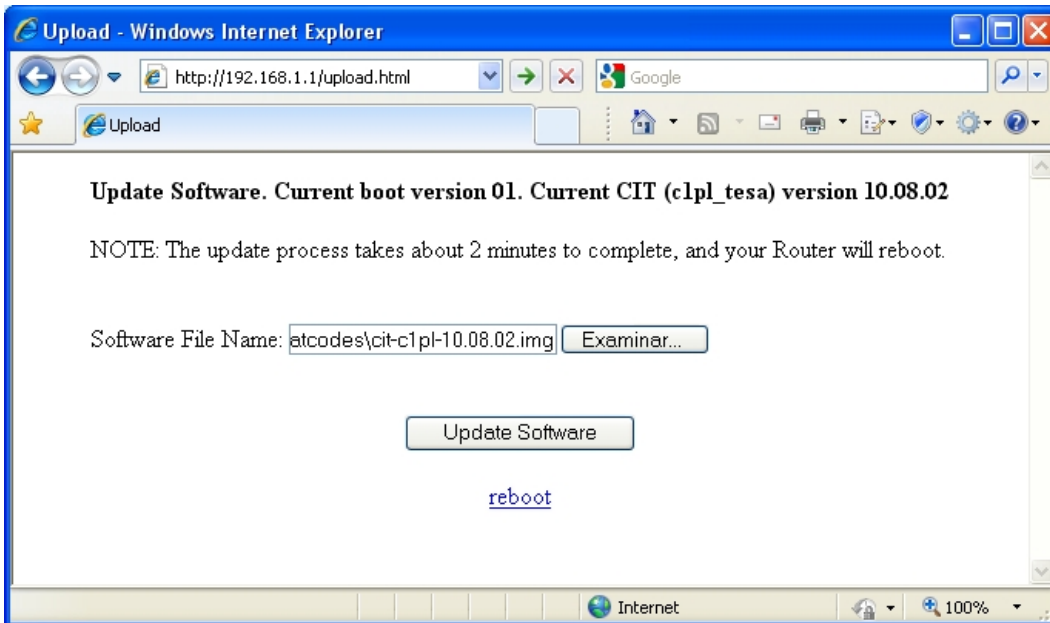
(6) **Wait for the device to automatically restart**. In cases where no errors have been produced, the following screen appears:
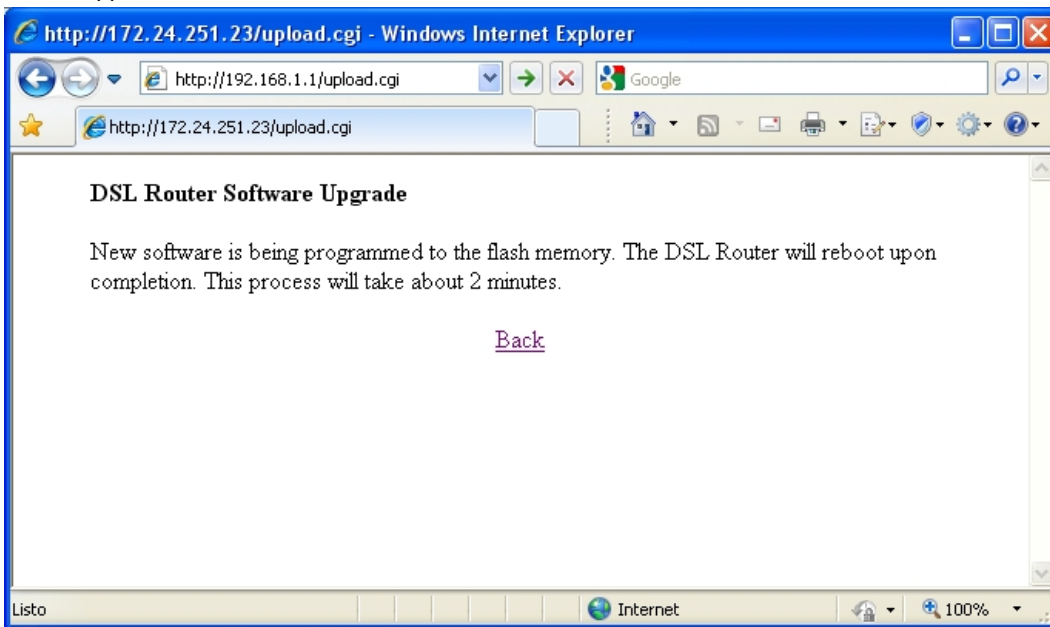
The loading process executes the following checks:

- **CRC check**: The CRC is calculated before starting to save to flash. In cases where the check proves to be incorrect, an error message appears and the updating stops:
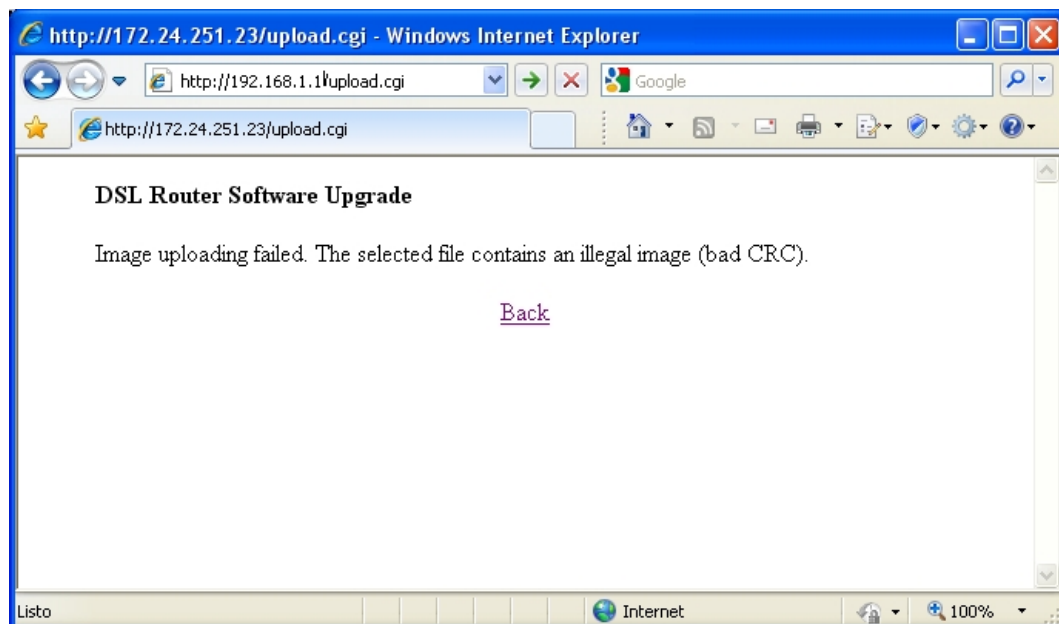
- **C.I.T. version check:** when you try and update the device with a version which is prior to the one currently loaded, the device will detect this, stop the updating and report this through the message that appears below:
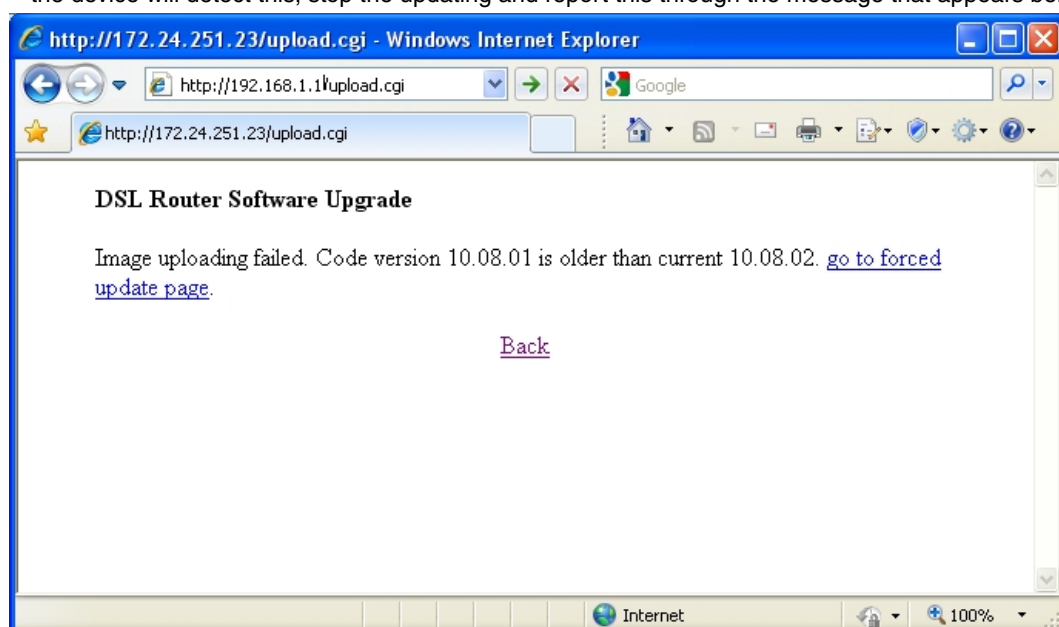
If you click on the "go to forced update page" link, this forces updating (downgrade the version).
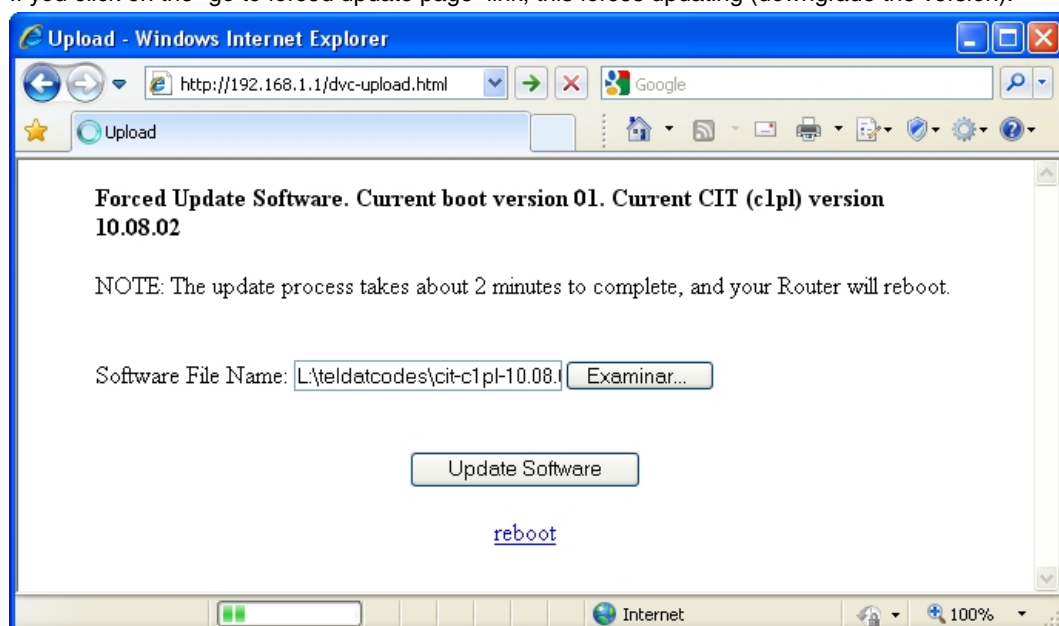
> **Note**
>
> We do not recommend that you load versions prior (downgrade) to the one currently loaded in the device. The configuration may be incompatible with the version you're trying to load.

- **Compatibility with the BOOT version check** : when you try to update the device with an C.I.T. image which is incompatible with the currently loaded BOOT version, the following message appears and the updating stops:

If you click on the "go to forced update page" link, this forces updating (downgrade the version).

> **Note**
>
> We do not recommend that you load CIT versions that are incompatible with the BOOT version. It's possible that the device won't operate correctly.

- **Other checks**: the BOOT executes another series of checks to verify the integrity and compatibility of the image you are trying to load.

        - Compatibility with the hardware.

        - Size compatibility.

2.2.2 FTP Updating

Our routers have an FTP server to which they can transfer files to update the device software. This server is only accessible if the device has started up properly (application being executed).

The steps to follow to execute updating are as follows:

(1) Decompress the distribution content to a directory; if the decompress has worked properly, then the content won't have undergone any alteration.

(2) Connect to the device FTP server (you need a user and password: default is user "root" without any password).

(3) Configure the binary mode through the "**bin**" command.

(4) Transfer the C.I.T. image " **put name-device-XX.XX.XX.img**".

(5) Once you have finished the transfer, execute the recording command through **"quote site savebuffer"**.

- Under certain circumstances, it's possible that the transfer command fails because the device doesn't have enough free volatile memory; in this case, activate the direct mode through the "**quote site direct on**" command before executing the transfer and deactivate it as soon as transfer is finished using the " **quote site direct off** "command. The direct mode causes the file being transferred to save directly in the Flash memory instead of being stored in a temporary buffer before being recorded. If you have a high speed connection, you'll see that the transfer is executed in bursts with pauses when recording to the Flash memory.

```
ftp> put
                    cit-c1pl-10.08.01.img
200 PORT is set to IP ADDR = 172.24.51.52  PORT = 1221
150 Data connection open, file transfer in process...
###############################################################################
###############################################################################
###############################################################################
###############################################################################
###############################################################################
###############################################################################
#############################
550 Error writing file.
2088960 bytes sent in 3,25 seconds (641,77 Kbytes/sec)
ftp> quote site direct on

200 DIRECT mode is set to ON.
ftp> put
                    cit-c1pl-10.08.01.img

200 PORT is set to IP ADDR = 172.24.51.52  PORT = 1222
150 Data connection open, file transfer in process...
###############################################################################
###############################################################################
###############################################################################
###############################################################################
###############################################################################
###############################################################################
###############################################################################
###############################################################################
#####################
226 STOR completed, 2708352 bytes processed, data connection is closed.
2708352 bytes sent in 50,59 seconds (53,53 Kbytes/sec)
ftp> quote site direct off
200 DIRECT mode is set to OFF.
ftp>
```

(6) Once you have finished the transfer, execute the recording command through " **quote site savebuffer** " (if you have used the direct mode, this command is not needed).

(7) Finally and optionally, you have a command that lets you check to see if the device has all the necessary files and if the versions of the elements are compatible with each other.

```
ftp> quote site coherence
550-COHERENCE results
  C.I.T.          v10.8.1 ID 0x00000000   HDW LVL 3
  BOOT          v01
550 COHERENCE results end
ftp>
```

(8)   Restart the device through the "**quote site reload on**" command; if you are exiting normally from FTP, the device restarts after some 30 seconds. If you are exiting FTP through "CTRL.-C" the device restarts immediately. You can also restart the device using the console command " **load immediate.**

```
*load immediate
Are you sure to reload the device(Yes/No)? y
```

For further information on the FTP commands, please see section *Loading a file through FTP* on page 21 (found further ahead in this manual).

For further information on the FTP server, please see manual *Teldat-Dm724-I* "*FTP Protocol*" .

☞ **Note**

There are commands in the FTP protocol, which due to their nature, take a considerable time to execute. Given this, some FTP clients decide to close the connection when they do not receive a response in an established time believing that there has been a problem with the server, as has occurred with the Windows FTP client. Specifically, this client has a non configurable 60 second time-out between the sending of a command and the reception of the response: when this time-out expires, the client understands that the session is closed.

```
226 STOR completed, 9414766 bytes processed, data connection is closed.
ftp: 9414766 bytes sent in 5.85Seconds 1609.64Kbytes/sec.
ftp> quote site savebuffer
Connection closed by remote host.
ftp>
```

If this situation occurs, please see manual *Teldat-Dm724-I* "*FTP Protocol*" .

2.3 Firmware upgrade files (UPG)

Some hardware modules (DSL card, WWAN modules, ...) use firmwares that are embedded in the card itself and are not stored in the router's Flash memory.

Upgrading the firmware of these modules is not a common task. As a result, firmware upgrade files are provided only on demand when needed.

Firmware upgrade files have to be loaded, through an FTP connection, into a temporal buffer belonging to the host router (i.e., without using the **quote site savebuffer** FTP command).

This is important because the file can be too big to fit into the host router's available Flash memory.

Once the upgrade process has finished, the temporal buffer should be released.

Further information is included in the installation manual of each hardware module that uses this schema.

Appendix A FTP Commands for uploads

A.1 Loading a file through FTP

In cases where you have FTP access to the device, you can use this protocol to update files. This functionality is similar to a standard FTP server, including some special features. If some commands are not available in the currently executed version, please check the "readme.txt" file, the device hardware information and other sections in this manual to obtain the required information.

Command	Function
quote site savebuffer	Saves the temporary buffer in the disk; on executing "put", information is not immediately stored in the disk instead it is saved in a temporary buffer.
quote site listfirmwares	Returns the firmware files list (*.bfw) required to ensure that the router runs correctly.
quote site systid	Returns information on the device, indicating the quantity of Flash and DRAM memory and license.
quote site compatible <off|on>	Deactivates or activates the BIOS and version checking. This is the same as site check version and site check bios.
quote site coherence	Carries out a check on the system's critical files and produces information on the results.
quote site check <item> <off|on>	Through this command the device can execute a series of automatic checks and actions aimed at managing the received files so they can be detected more easily as known files. There are various actions that can be controlled using this command. (For further information, please see the FTP manual). The actions most commonly used in updating are as follows: • SITE CHECK VERSION OFF | ON Activates or deactivates the rejection of files whose versions are older than that currently running in the device. • SITE CHECK BIOS OFF | ON Activates or deactivates the rejection of applications whose minimum version of the required BIOS or BOOT is subsequent to the BIOS or BOOT version currently running in the system.
quote site direct on	Forces the system to store the sent file on the disk in the same way as received, without storing it in the temporary buffer. This command must be activated when the system does not have enough temporary memory to store the file before recording it.
quote xmd5 <filename.ext>	Calculates the MD5 signature for a file present in Flash to be contrasted with the signature of the same file provided in the distribution .md5 file.
quote site backup	In devices with Flash backup system, this copies the main partition information to the backup partition so, in cases where there are problems with the main partition, this restores the copy saved in the backup partition. For further information on the Flash backup system, please see appendix *Flash Backup System* on page 22.

> **Note**
>
> The "quote site direct on" and "quote site compatible off" commands should only be activated when absolutely necessary.

Appendix B Flash Backup System

B.1 Distribution with BIOS, C.I.T. and FWs files

B.1.1 Introduction

The Flash backup system permits automatic restoration of the last successfully installed distribution when the device detects problems in some of the software elements (BIOS FLASH, application and firmwares).

The Flash backup system needs the Flash disk to be partitioned into two units, known as main and backup. This partitioning means that the available space for installation is less (half) and therefore should only be activated when considered necessary and the installation to be carried out can be fitted into the main unit.

B.1.2 Flash Disk Formatting

There are two ways to format the Flash disk:

- All of it as one partition, i.e. with maximum capacity.
- As two partitions, one as main and the other as backup, each one containing half of the capacity.

To find out how much Flash memory there is in the device, please see appendix *Information required for updating* on page 27.

Formatting the Flash disk is **destructive** and only available in the local console in order to guarantee that the user has local access to the device to load it adequately.

(1) Pause device start up in the BIOS by pressing CTRL-T keys together when a series of periods appear after two ">" symbols.

```
**************************************************
**************************************************
**************************************************
BOOT CODE VERSION: 01.10  Oct 30 2006 17:17:43
  gzip  Oct 30 2006 17:08:44
P.C.B.: 74  MASK:0A01  Microcode:0070
START FROM FLASH
BIOS CODE DUMP.....................
BIOS DATA DUMP....
End of BIOS dump
 Boot-stack used: 0x00000788
 Boot-stack free: 0x00001878
BIOS CODE VERSION: 01.10
CLK=294912 KHz   BUSCLK=65536 KHz   PCICLK=32768 KHz   L1
Date: 02/26/07, Monday         Time: 17:14:20
SDRAM size: 128 Megabytes
   BANK 0: 128 Megabytes (detected)
I_Cache: ON
D_Cache: ON   Write-Back
FLASH: 16 Mb.
NVRAM: 128 Kb.
EEPROM: 2048 Bytes.
DPRAM: 16384 Bytes.
WAN1: DTE
WAN2: DTE
ISAC
RDSI_B
RDSI_B
FAST ETHERNET 1
FAST ETHERNET 2
PCI device: Host bridge
  (Bus: 0, Device: 0, Function: 0)
  (Subs. Vendor: 0x0000, Subs. Device: 0x0000)
Current production date: XX XX
Current software license: X XX
Current serial number: XXX/XXXXX
```

```
BIOS MAC Add: XX-XX-XX-XX-XX-XX>>
...
```

(2) Access the Flash disk menu:

```
    === INITIAL  MENU ===
  a) Change Time
  b) Change Date
  c) Change Code to Run
  d) Change Licence
  e) Load from console (pc_load)
  f) Disk menu
  g) Set default name for file loaded from console
  h) Change BIOS licence
  l) Load from lan
  v) Change version control for loading
  x) Load from console (xmodem)
  r) Reset
  lram) Load from lan and run without saving
  0) Exit
     >>f
   === DISK MENU  ===
 a) Change active drive.
 c) Copy file.
 d) Show files.
 e) Erase file.
 f) Format disk.
 r) Rename archive.
 0) Exit
```

(3) Select the formatting option: if you want a single partition, select the "A: (only one disc - Full size)" option; if you want two partitions, format the main partition through the "AH: (Main disc - Half size)" option and subsequently the backup through "B: (BK disc - Half size)".

```
    === DISK MENU  ===
 a) Change active drive.
 c) Copy file.
 d) Show files.
 e) Erase file.
 f) Format disk.
 r) Rename archive.
 0) Exit
    A:>>f
This operation can provoke important damages to equipment. Continue?(y/n): y
  A: (only one disc - Full size)
  AH: (Main disc - Half size)
  B: (BK disc - Half size)
  S: (Smart Card)
Drive: AH
Are you sure to format drive AH: ?(y/n):y
Drive formated O.K.
    === DISK MENU  ===
 a) Change active drive.
 c) Copy file.
 d) Show files.
 e) Erase file.
 f) Format disk.
 r) Rename archive.
 0) Exit
    A:>>f
This operation can provoke important damages to equipment. Continue?(y/n): y
  A: (only one disc - Full size)
  AH: (Main disc - Half size)
  B: (BK disc - Half size)
  S: (Smart Card)
Drive: B
Are you sure to format drive B: ?(y/n):y
Drive formated O.K.
```

Here you can see how both partitions have the same size.

```
     === DISK MENU  ===
   a) Change active drive.
   c) Copy file.
   d) Show files.
   e) Erase file.
   f) Format disk.
   r) Rename archive.
   0) Exit
      A:>>d
Enter path:
Volume label: FLASH_DISK
                  0 File(s)
Free room in drive A:*.* = 7847936 Bytes.
     === DISK MENU  ===
   a) Change active drive.
   c) Copy file.
   d) Show files.
   e) Erase file.
   f) Format disk.
   r) Rename archive.
   0) Exit
      A:>>a
Present drives:
   A:   FLASH_DISK
   B:   FLASH_DISK
Current active drive: A:
Select new active drive: B:    OK.
Current active drive: B:
     === DISK MENU  ===
   a) Change active drive.
   c) Copy file.
   d) Show files.
   e) Erase file.
   f) Format disk.
   r) Rename archive.
   0) Exit
      B:>>d
Enter path:
Volume label: FLASH_DISK
                  0 File(s)
Free room in drive B:*.* = 7847936 Bytes.
```

Here you can see how to format everything in the same partition, the size is double.

```
     === DISK MENU  ===
   a) Change active drive.
   c) Copy file.
   d) Show files.
   e) Erase file.
   f) Format disk.
   r) Rename archive.
   0) Exit
      A:>>f
This operation can provoke important damages to equipment. Continue?(y/n): y
   A: (only one disc - Full size)
   AH: (Main disc - Half size)
   B: (BK disc - Half size)
Drive: A
Are you sure to format drive A: ?(y/n):y
Drive formated O.K.
     === DISK MENU  ===
   a) Change active drive.
   c) Copy file.
   d) Show files.
   e) Erase file.
   f) Format disk.
   r) Rename archive.
   0) Exit
```

```
        A:>>d
Enter path:
Volume label: FLASH_DISK
                    0 File(s)
Free room in drive A:*.* = 16224256 Bytes.
```

B.1.3 Operating Flash Backup System

Once the Flash backup system has been enabled, the user must establish the restoration point, i.e. execute the copy of the main partition information to the backup partition. There are two commands available for this:

(1)   Console

```
*config
Config>backup-files
Backup successful.
Config>
```

(2)   FTP

```
ftp>quote site backup
```

> **Note**
>
>   Depending on the FTP client used, you can close the session before finishing the operation.

Once the restoration point has been established, the system is automatic:

(1)   On start up, the BIOS search for the application established as active.

(2)   If it doesn't find it (searching by name) or the CRC is incorrect, it searches for the next existing application file (*.bn) in the main partition.

(3)   If it doesn't find the next application file or the CRC is incorrect, it makes a copy from the backup partition to the main partition: i.e. it executes a "backup restoring".

(4)   Once the application has started up, when a determined firmware has been requested (*.bfw files), the application checks that the file is in the main partition and if it has a valid CRC; if the "**firmware-checking**" command is configured, and some of the requested firmwares fail (or do not exist or the CRC is invalid), the application requests a "backup restoring" and makes the router reset.

(5)   Once the BIOS or the application has provoked a "backup restoring", the flag, which indicates that this has started up from backup and which can only be deactivated when you successfully re-execute the " **backup-files**" or the "**quote site backup**" command, activates.

All the executed actions are registered in the log which is accessible through the **nvrlog list**" command:

```
*monitor
Console Operator
*event
-- ELS Monitor --
+nvrlog list
05/17/06 12:35:50 -5- Files backup OK
05/17/06 12:34:33 -1- Loading from backup
05/17/06 12:33:15 -1- Backup restored by flag
05/17/06 12:32:16 -1- Invalid file (fw000008.bfw). Restoring backup
05/17/06 12:24:10 -3- Restart issued by the user
05/17/06 12:24:08 -5- Configuration saved on Flash
05/17/06 12:18:16 -5- FTP Reset
```

B.2 Distribution with the C.I.T. image file (IMG)

B.2.1 Introduction

Devices with C.I.T. image file distribution do not implement the backup flash functionality although it does allow you to save two C.I.T. images. It's the BOOT that automatically maintains the last two loaded images, provided that the total sum of the image sizes does not exceed the available amount of Flash.

### B.2.2 Operating a system with double image in flash

(1)   On start up, the BOOT searches for the application established as active.

(2)   If it finds it, the device boots. If it doesn't or the CRC is wrong, it looks for the second image.

(3)   If it finds it, the device boots. If it doesn't or the CRC is wrong, this causes the router to restart.

Appendix C Information required for updating

C.1 How to determine the appropriate distribution and the appropriate binary

To update a device, you need to know its identifier and the current license. This information can be obtained by:

- Checking the label found on the underside of the device (this is only valid to determine the device identifier, not the current license).
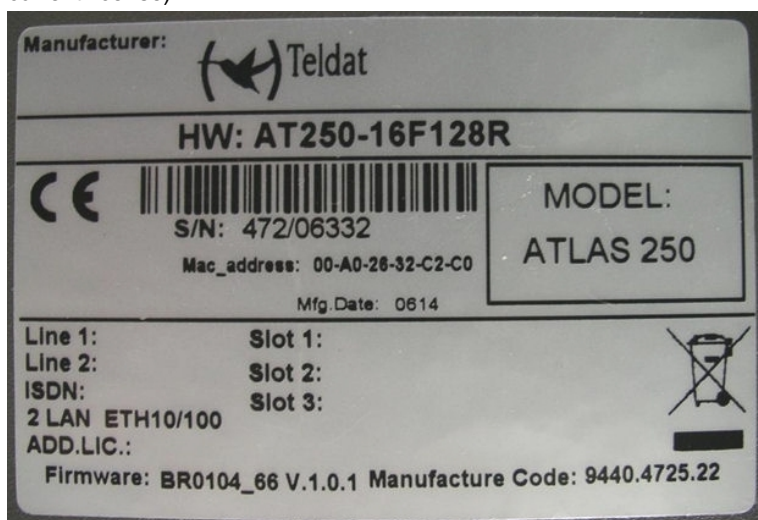
- In console (local or Telnet) through the monitoring command "configuration" .

```
*monitor
+configuration
Teldat's Router, ATLASi60 HSPA+ Development System 28 222  S/N: 757/00124
Profile: irp
ID:  L28.222


Boot ROM release:
 BIOS CODE VERSION: 04.03  Jan  7 2016 10:49:14 L1 F


System Info:
PCB:0x129 GPPORCR:0x00290000 PVR:0x80212051 SVR:0x80EC0011
CLKs: CCB=396000 CPU0/1=792000/792000 DDR(clk)=330000 LBUS=49500 PCI0/1=0/65536
Watchdog:Enabled
MMU Mode:Dynamic
ICache:ON DCache:ON Write-Back L2Cache:ON
CASE1 fan speed: 3641 rpm (45 %)
CASE2 fan speed: 3602 rpm (45 %)
CASE3 fan speed: 3773 rpm (47 %)


Software release: 11.01.00-Beta-636e646 Mar  1 2016 12:18:01
Compiled by integrator on ares.id.teldat.com
Loaded from primary partition


Hostname: TA-Atlas-60-11     Active user: admin
Date:    Friday, 08/14/15    Time: 10:54:17
Router uptime: 4s


Name      Protocol
IP        Internet Protocol
IP6       IPv6
ARP       Address Resolution Protocol
CFM       Connectivity Fault Management
ASRT      Adaptive Source Routing Transparent Enhanced Bridge
DLS       Data Link Switching
dot1X     Extensible Authentication Protocol Over LAN
RIP       Route Information Protocol
```

```
OSPF      Open SPF-Based Routing Protocol
BGP       BGP
BFD       Bidirectional Forwarding Detection
NHRP      Next Hop Resolution Protocol
DHCP      Dynamic Host Configuration Protocol
L2TP      L2TP
SNMP      SNMP
IGMP      Internet Group Management Protocol
PIM       Protocol Independent Multicast
MSDP      Multicast Source Discovery Protocol
SIP       SIP
H323      H323
NOE       UA/NOE
SCCP      SCCP
MGCP      MGCP
RPNG      RIPng
OSPFv3    OSPFv3
DHCPv6    DHCPv6


18 interfaces:
Connector      Interface            MAC/Data-Link       Status
GE0/FE0/LAN1  ethernet0/0          Ethernet/IEEE 802.3  Disabled
GE1/FE1/LAN2  ethernet0/1          Ethernet/IEEE 802.3  Disabled
SWITCH        ethernet0/2          Ethernet/IEEE 802.3  Disabled
SLOT1         g703pTeldat's Router, ATLASi60 HSPA+ Development System 28 222  S/N: 757/00124
Profile: irp
ID:  L28.222


Boot ROM release:
 BIOS CODE VERSION: 04.03  Jan  7 2016 10:49:14 L1 F


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Name      Protocol
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```

```
MSDP     Multicast Source Discovery Protocol
SIP      SIP
H323     H323
NOE      UA/NOE
SCCP     SCCP
MGCP     MGCP
RPNG     RIPng
OSPFv3   OSPFv3
DHCPv6   DHCPv6


18 interfaces:
Connector      Interface           MAC/Data-Link       Status
GE0/FE0/LAN1  ethernet0/0         Ethernet/IEEE 802.3  Disabled
GE1/FE1/LAN2  ethernet0/1         Ethernet/IEEE 802.3  Disabled
SWITCH        ethernet0/2         Ethernet/IEEE 802.3  Disabled
SLOT1         g703port1/0         PRI/E1 Net           Up
SLOT2         serial2/0           HDLC                 Up
SLOT2         serial2/1           HDLC                 Up
SLOT2         serial2/2           HDLC                 Up
SLOT3         atm3/0              ATM                  Down
SLOT3         ethernet3/0         Ethernet/PTM         Disabled
SLOT3         atm3/1              ATM                  Down
SLOT3         ethernet3/1         Ethernet/PTM         Disabled
SLOT3         atm3/2              ATM                  Down
SLOT3         ethernet3/2         Ethernet/PTM         Disabled
SLOT3         atm3/3              ATM                  Down
SLOT3         ethernet3/3         Ethernet/PTM         Disabled
SLOT4         wlan0/0             WLAN                 Down
ANT           cellular0/0         Async serial line    Down
ANT           cellular0/1         NIC interface        Down


SNMP OperStatus:
Interface          OperStatus
ethernet0/0        Down
ethernet0/1        Down
ethernet0/2        Down
g703port1/0        Up
serial2/0          Up
serial2/1          Up
serial2/2          Up
atm3/0             Down
ethernet3/0        Down
atm3/1             Down
ethernet3/1        Down
atm3/2             Down
ethernet3/2        Down
atm3/3             Down
ethernet3/3        Down
wlan0/0            Down
cellular0/0        Down
cellular0/1        Down


Encryption Engines:
    Hardware: SEC-85XX Revision: 0x300303, block 0x300303


Cellular Driver Version: 00.09


WLAN Driver Version: 9.5.0.35.1
```

• Via FTP, using the "quote site systid" command.

```
ftp> quote site systid
211  L28.222
ftp>
```

To identify the distribution corresponding to the device, simply check the initial part of the identifier:

• TC # Teldat M distribution (the Teldat C software is contained in the Teldat Modular).

- TM # Teldat M distribution
- AT # ATLAS distribution
- AT2G # ATLAS 2G distribution
- ...

To identify what application binary should be downloaded in your device, check the "version_map.txt" file included in the distribution and find the first condition this fulfills.

For example, in the case of the distribution for Atlas6x devices, licenses 28 xxxx correspond to all models of Atlas6x:

```
L28.*, *F, *R, *, irp.bin, Atlas6x
```

C.1.1 How to determine the necessary firmware

To determine what firmwares a device needs, you have two options:

(1) The FTP server command "**quote site listfirmwares**" which returns a list with the firmware file names included in the distribution which must be sent.

```
ftp> quote site listfirmwares
211 fw000000.bfw;fw000002.bfw
ftp>
```

(2) The "**system firmwares**" command.

```
*monitor
Console Operator
+system firmwares
List of required firmwares for detected hardware
-----------------------------------------------
   Filename                   Description
-------------- --------------------------------------------------
 fw000000.bfw    Alcatel-SGS Thomson DynaMiTe ADSL over POTS
 fw000002.bfw    Analog Devices Eagle ADSL over POTS
```