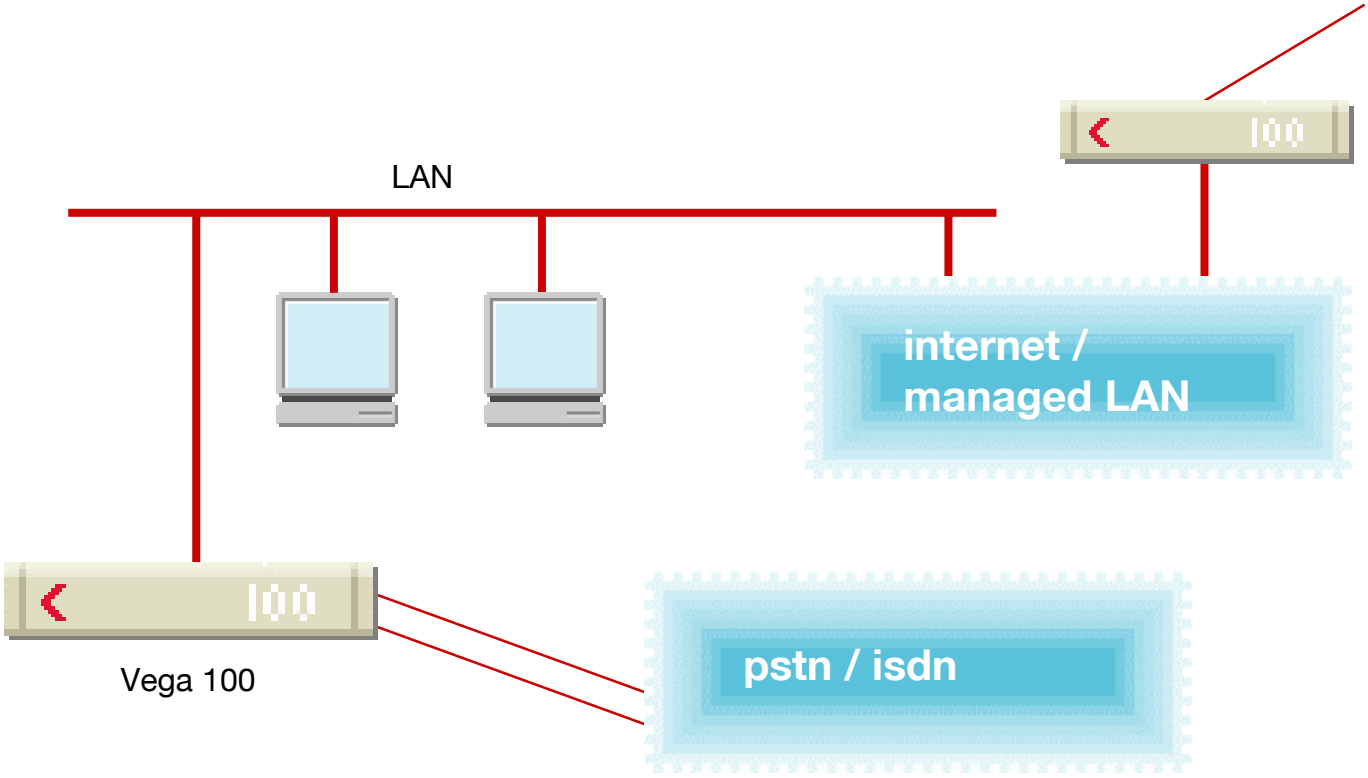
Initial configuration
Vega 100 T1 (H.323)
Standalone mode – R5.1

This document describes how to configure the Vega 100 T1 H.323 unit using the web browser interface. The configuration described will allow the Vega to be rapidly installed and tested.

The instructions below will configure the Vega 100 to be a trunking gateway routing all telephony calls it receives to a specified IP address (typically a partner gateway). It will also route all calls it receives from the VoIP interface to the telephony interfaces. Specifically the Vega will be configured to act as follows:

- For calls received from the telephony interface, the Vega will prefix the dialled number with the interface ID that the call arrived on (so that this can be used to route the call at the destination gateway).
- For calls received over the VoIP interface, the Vega will take the first 2 digits of the supplied telephone number and use these to select the trunk to route the call through. It will use the remainder of the number as the telephone number to dial.

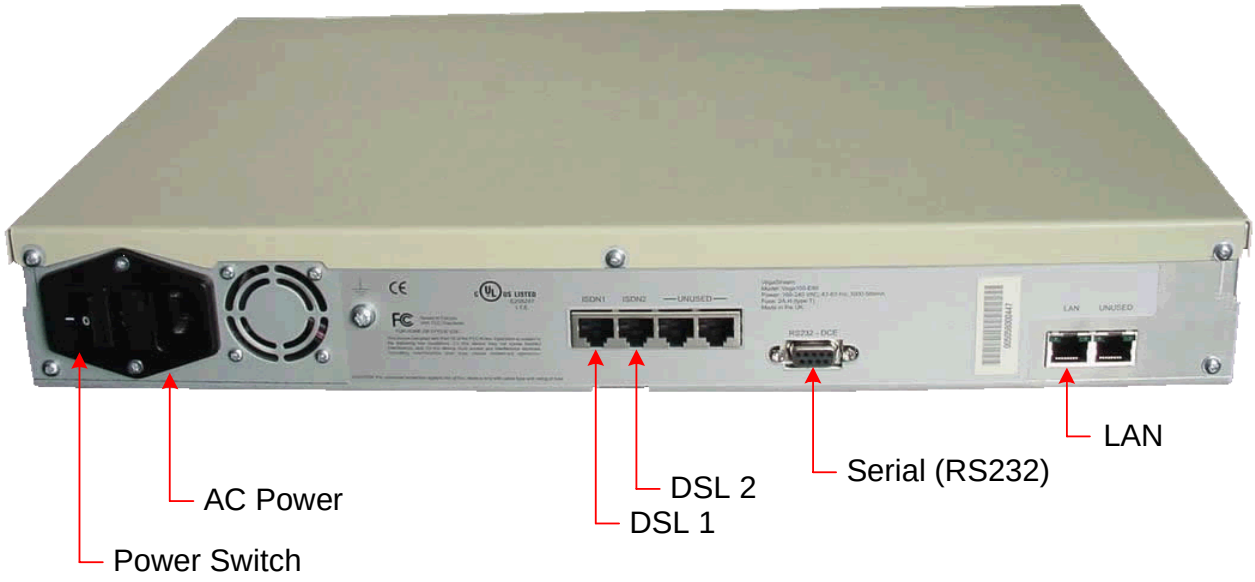


The configuration process is broken down into 11 stages as follows:

1 Connect your Vega to LAN, Telephone and Power
2 Configure the basic LAN parameters
3 Configure password and login timeout
4 Check and configure LAN settings and Host name
5 Configure H.323 parameters
6 Configure the Dial Plan
7 Configure audio parameters
8 Configure DSLs
9 Configure pointer to CD ROM documentation
10 Save Changes
11 Archive Vega Configuration

Please also see:
12 Technical Support
13 Advanced configuration

1. Connect your Vega to LAN, Telephone and Power



Before installing your Vega, ensure that you read the VegaStream VoIP Gateways Safety and Compliance Information document.

LAN:
Using the yellow booted cable connect the LAN port on the Vega [5] to a standard or fast Ethernet hub or switch (10 baseT or 100 baseTx). The connector nearest the ferrite core should be plugged into the Vega.

Telephony:

Connection to a PBX - If you are connecting the Vega 100 to a PBX, the Vega 100 acts as the NeTwork equipment and a red-booted cable must be used.

For each trunk that is to be connected to the PBX, insert one end of a red booted cable into one of the Vega 100 DSL sockets [DSL 1 or DSL 2] and the other end to the PBX.

Connection to the PSTN - If you are connecting the Vega 100 directly to the public telephone network it acts as the Terminal Equipment and the blue-booted cable must be used.

For each trunk that is to be connected to the PSTN, insert one end of a blue booted cable to one of the Vega 100 DSL sockets [DSL1 or DSL2] and the other end to the PSTN terminating box.

Power:
Insert the power cable into the AC power inlet on the Vega and switch on. The power LED on the front panel will illuminate.

The LAN LEDs will also illuminate indicating 10 (baseT) or 100 (baseTx) connection, and the FDX LED will illuminate if Full Duplex mode has been negotiated.

2. Configure the basic LAN parameters

If a DHCP server is available, by default, the Vega will automatically pick up an IP address. If you know the IP address served to the Vega, skip this section and start at 3.

If DHCP is not to be used to provide the Vega with an IP address, or you need to check the IP address provided to the Vega, connect the serial interface of the Vega to a PC serial interface using a 9 way male to female straight through cable.

Configure a terminal emulator program (such as Microsoft's HyperTerminal) for:

- Speed = `115200 baud`
- Data bits = `8`
- Parity = `none`
- Stop bits = `1`
- Flow Control = `none`

Press <Enter> to get the Username: prompt

At the prompts enter the default user name and password

Username: `admin`

Password: `admin`

To display the current IP address, type:

- `show lan.ip`

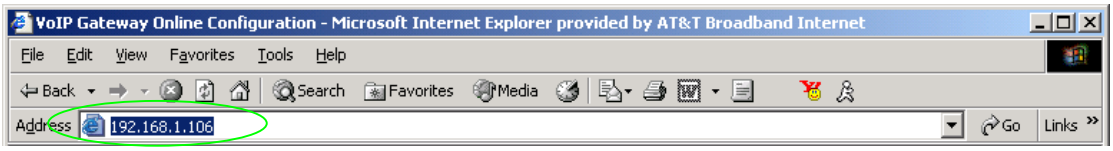
If this is not the IP address required, it can be overridden, together with other LAN parameters by typing:

- `set lan.use_dhcp=0`
- `set lan.ip=aaa.bbb.ccc.ddd`
- `set lan.subnet=eee.fff.ggg.hhh`
- `set lan.gateway=iii.jjj.kkk.lll`
- `save`
- `reboot system`

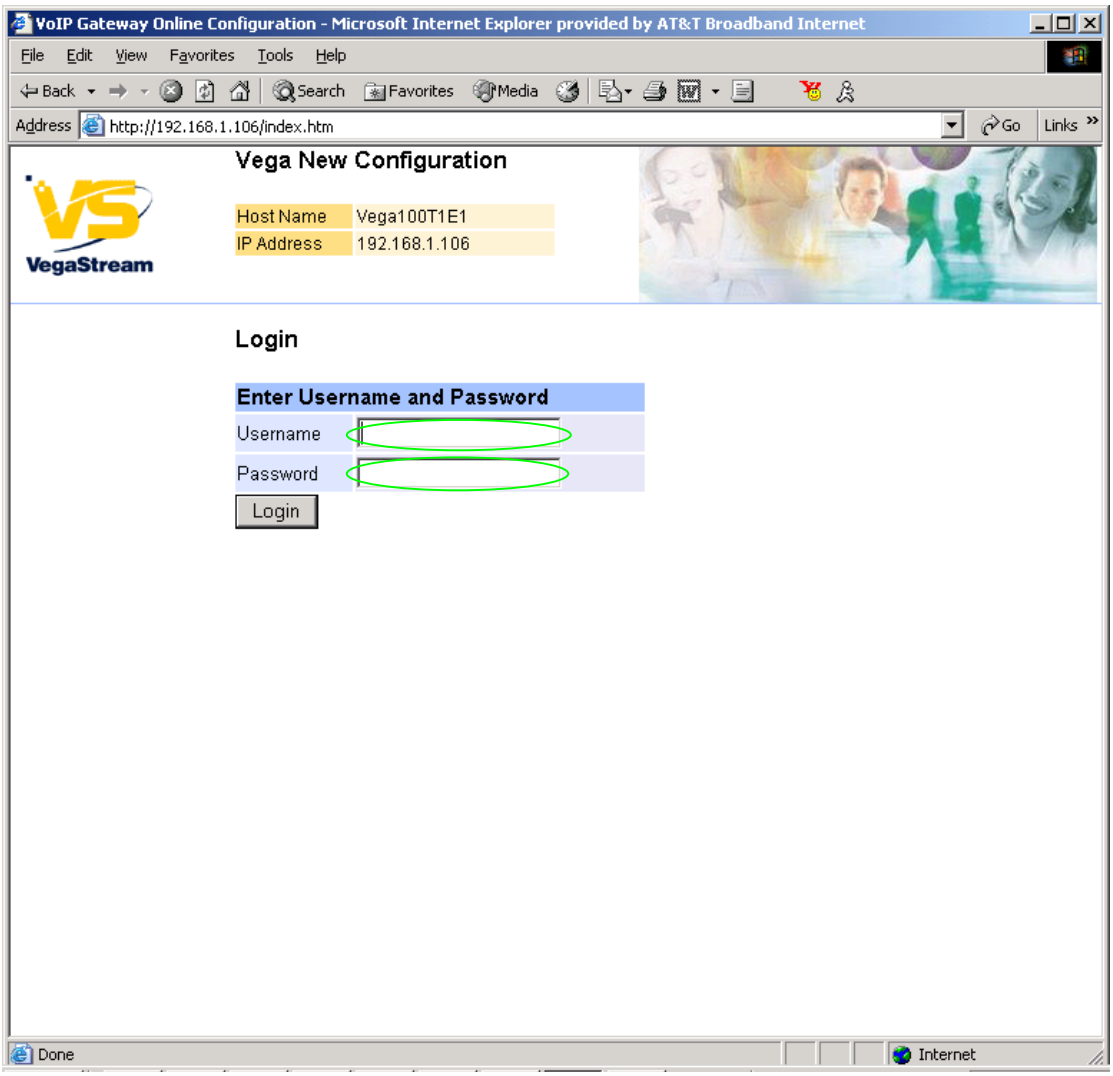
3. Configure password and login timeout

Now configuration will be carried out via a web browser.

➢Enter the IP address of the Vega into the “Address” field of your web browser.



You will then be presented with the login page:

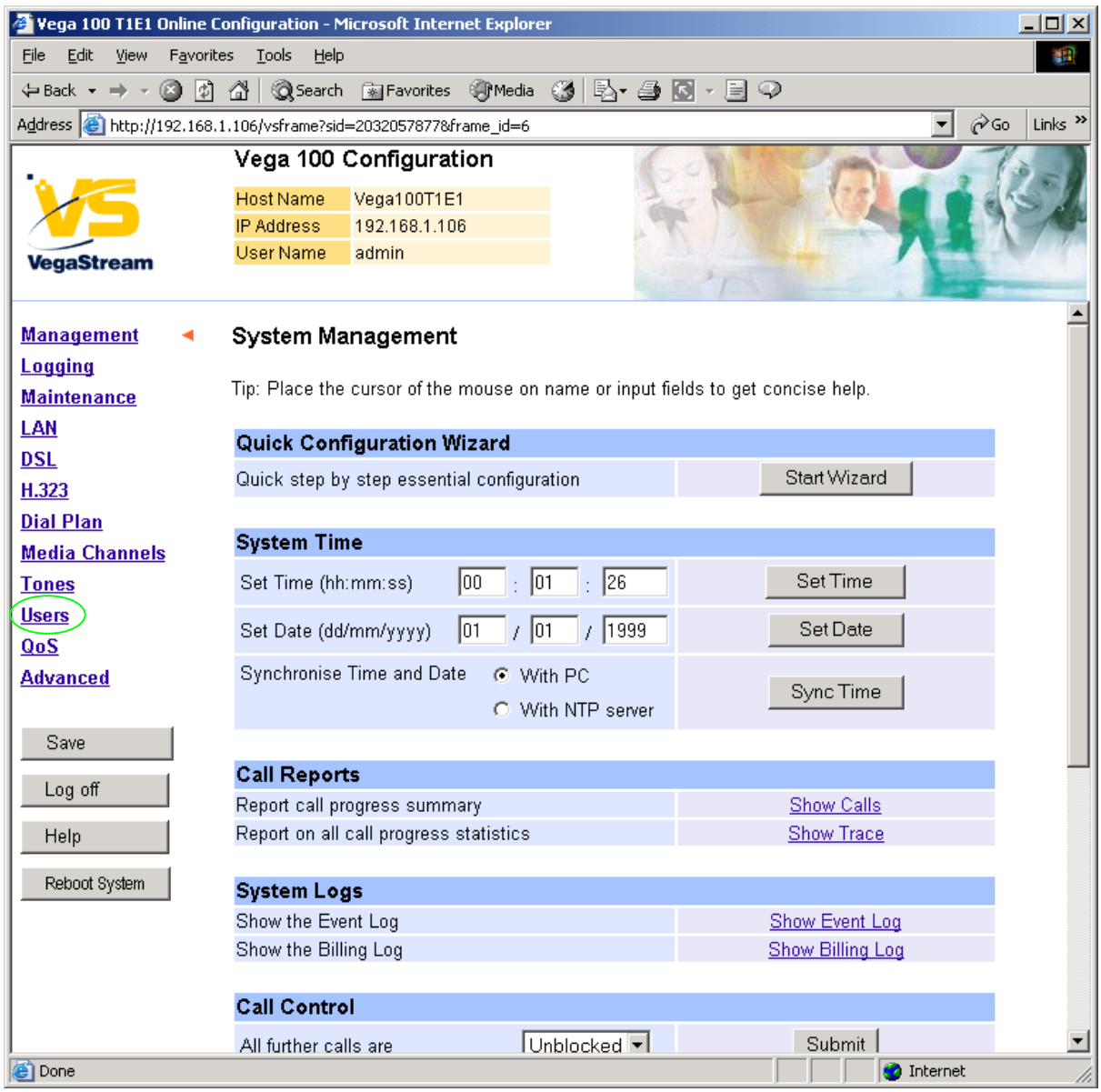


Enter the default Username and Password

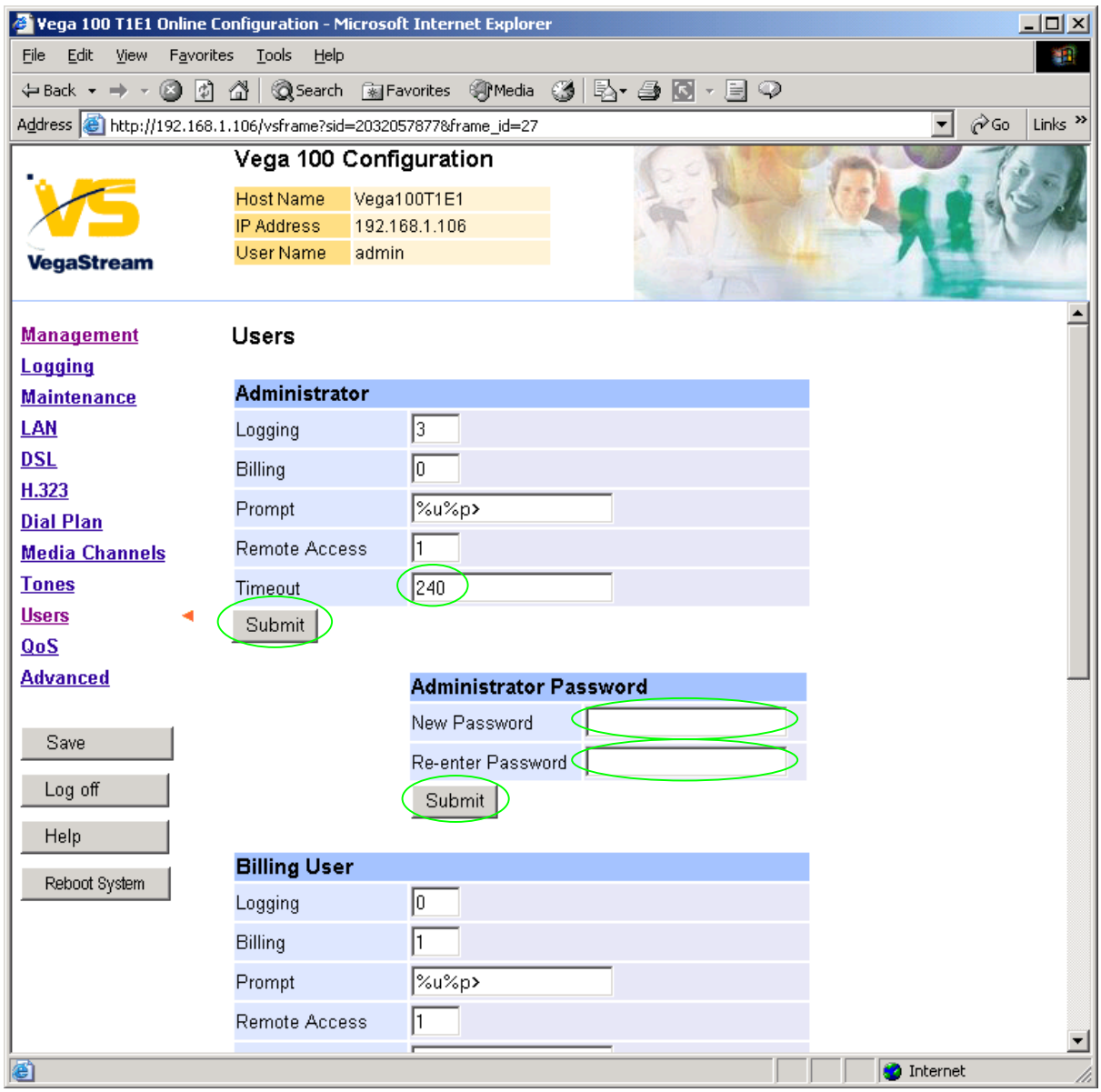
➢Username: `admin`

➢Password: `admin`

➢Select Login



- On the left hand side menu select Users



Recommended: Change the password

- enter New Password and Re-enter Password then
- select Submit and then click "here" to return

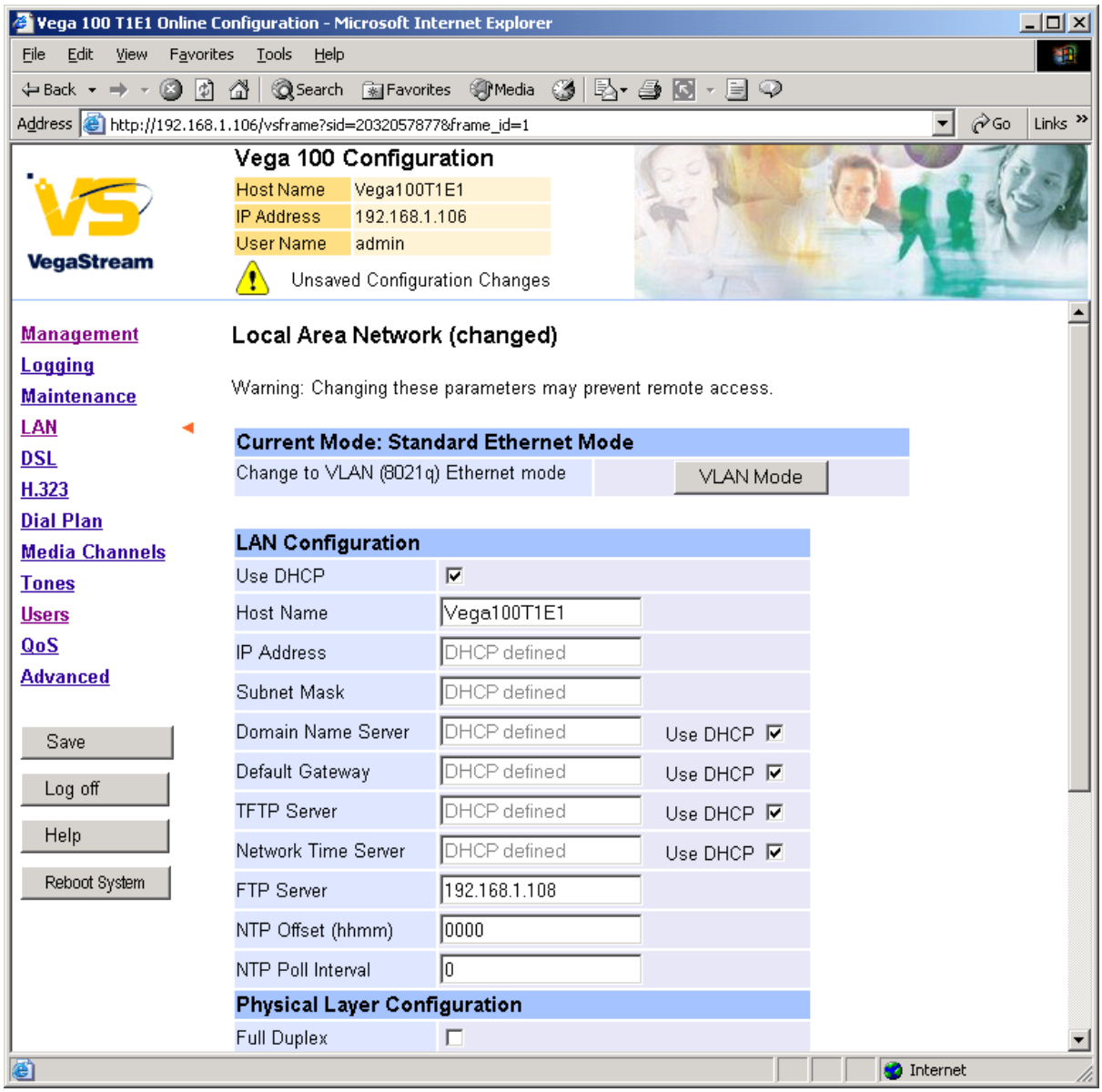
Optional: Change the timeout[1] – default is 240 seconds; can extend to 7200 seconds (2hrs)

- select Submit and then click "here" to return

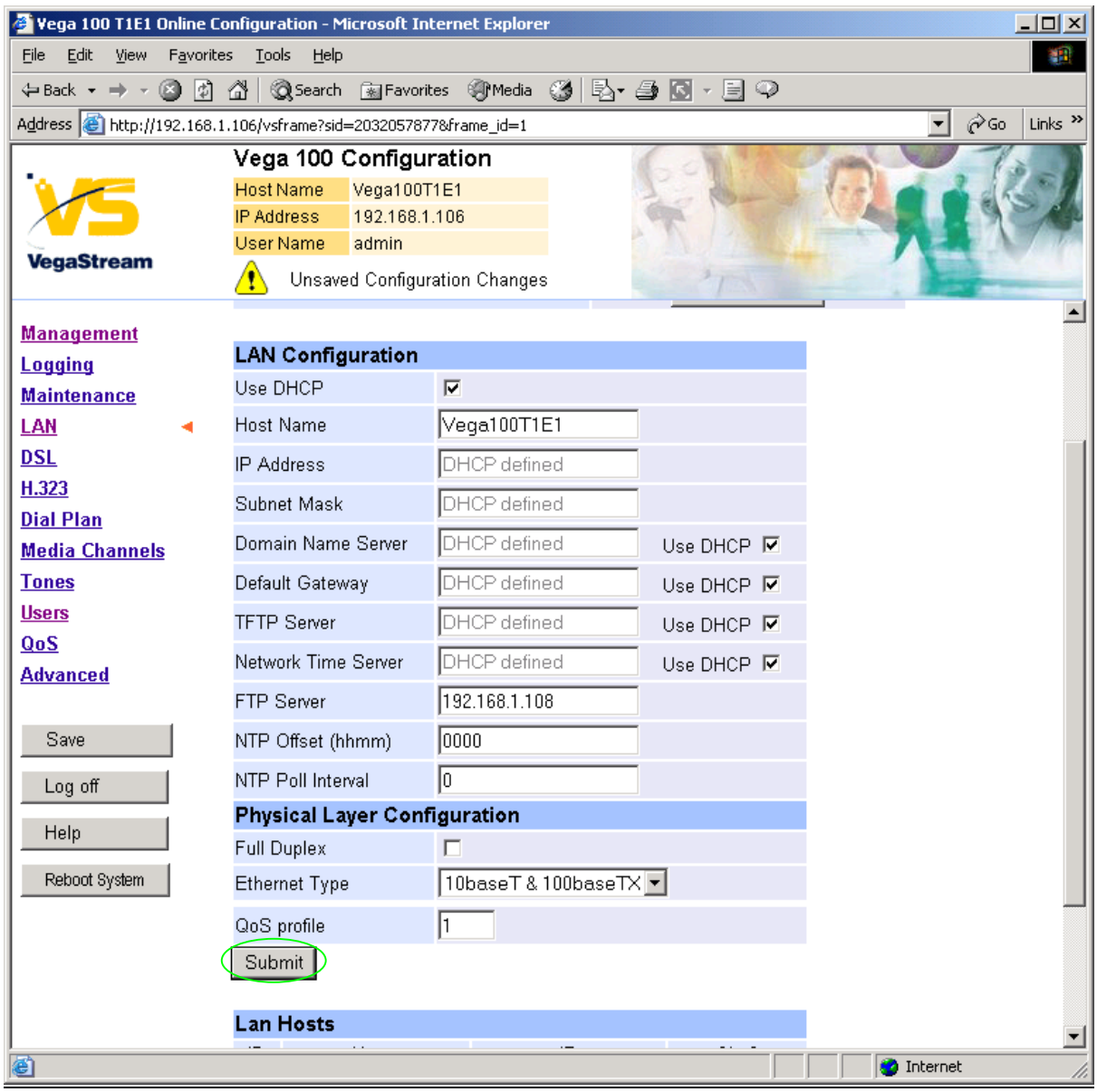
[1] If the web interface is not used for this length of time the Vega will automatically log off the session. This change is only activated by logging out and back into the browser session.

4. Check and configure LAN settings and Host name

➢On the left hand side menu select LAN



➢Scroll down to see the whole of the **LAN Configuration** section

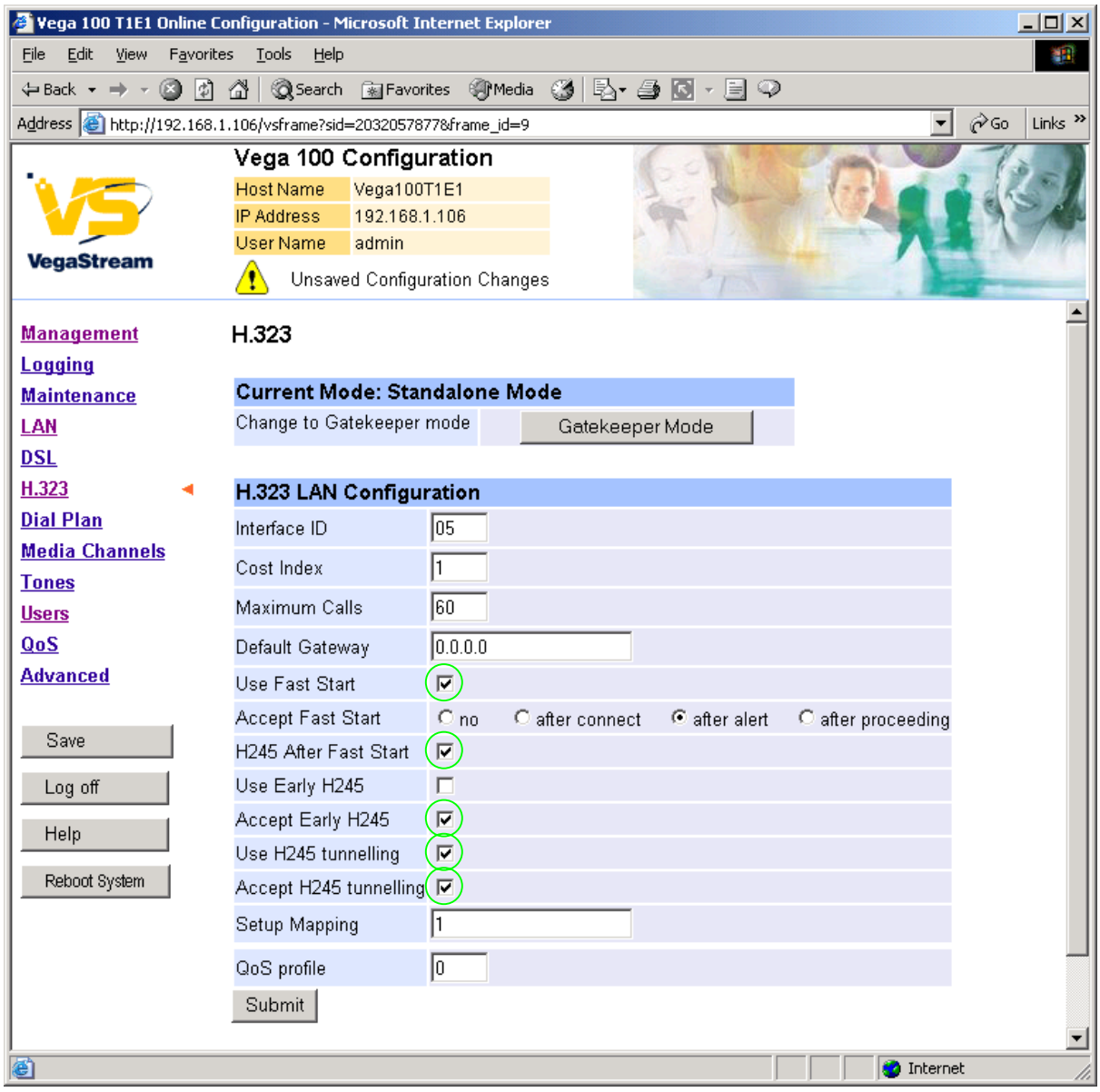


Optional: If there are any LAN values that need to be set up (e.g. NTP server or tftp server) set them up now, then

➢Select Submit and then click "here" to return

5. Configure H.323 parameters

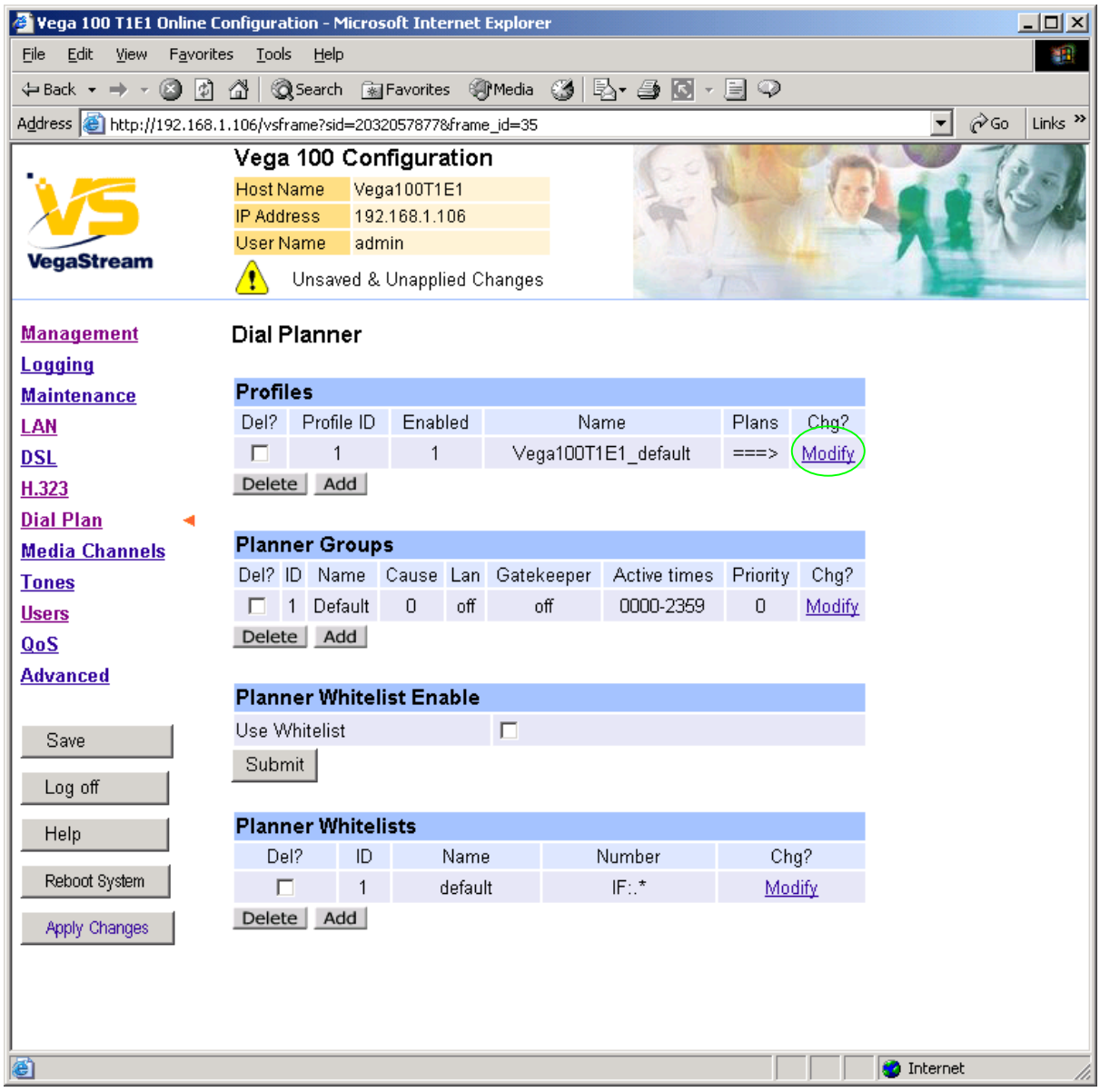
➢On the left hand side menu select H.323



*If this Vega is to be inter-working with another Vega leave the **H.323 LAN Configuration** alone, if it is to work with other manufacturer's devices, it is often best to untick the indicated items – as these are advanced H.323 features that are not always supported by other manufacturers. Once the Vega and the other device are working in the basic H.323 mode, try enabling other features – back towards this configuration, as this will improve call setup times.*

6. Configure the Dial Plan

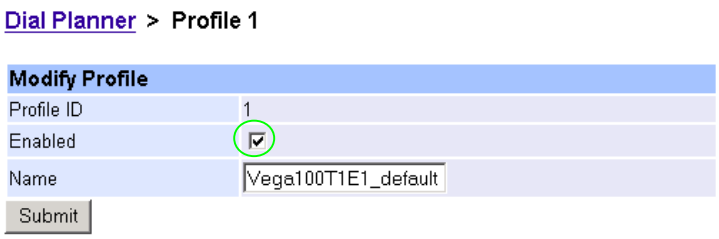
➢On the left hand side menu select Dial Plan



Firstly, turn off the default profile:

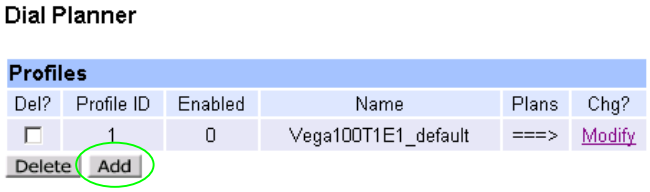
In the **Profiles** section, Profile ID 1

➢ Select Modify



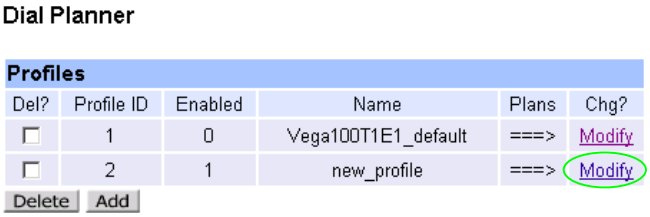
- disable (un-tick) Enabled, then
- select Submit and then click "here" to return

Now create a new profile and in it create a dial plan entry to handle calls being sent from ISDN to the LAN:



In the **Profiles** section

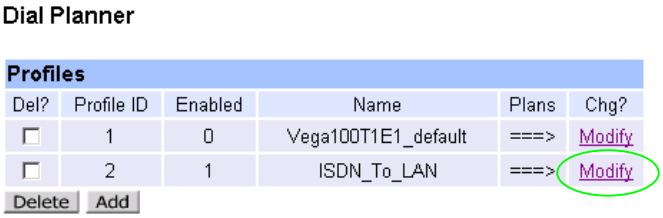
- Select Add



In the **Profiles** section, on Profile 2 (the new profile):

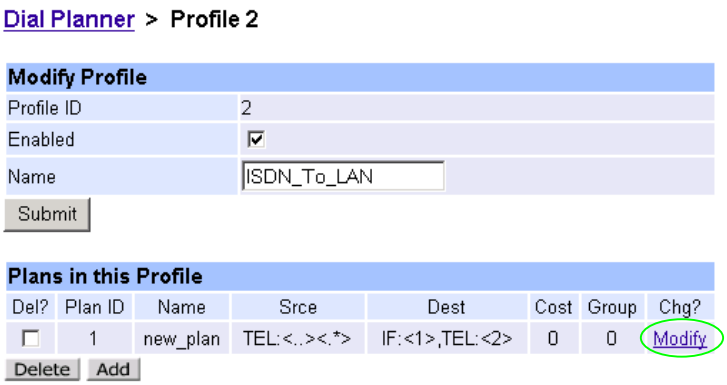
- Select Modify

- Set Name = `ISDN_To_LAN`
- select Submit and then click "here" to return



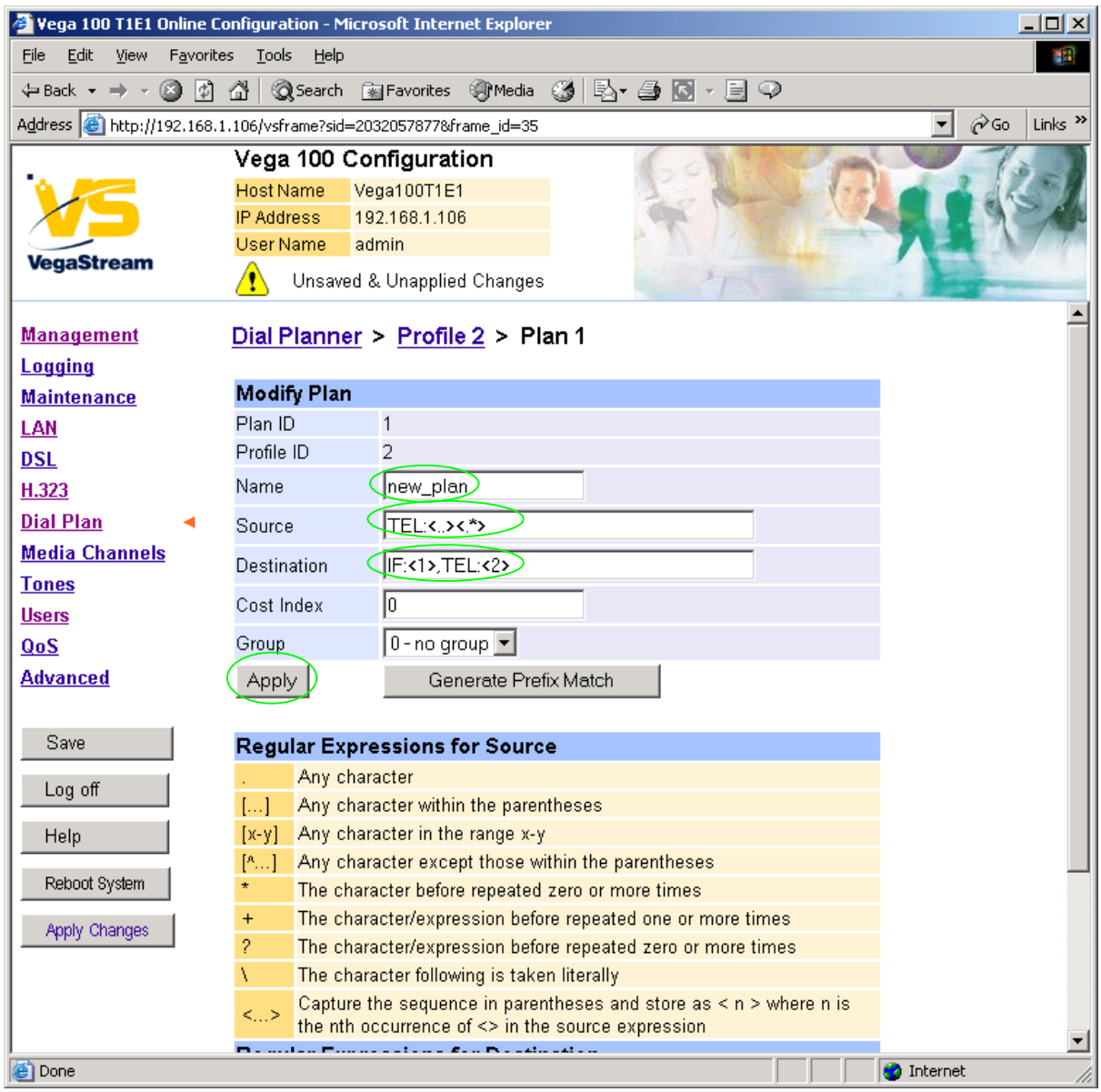
In the **Profiles** section, on Profile 2 (the ISDN_To_LAN profile):

- Select Modify

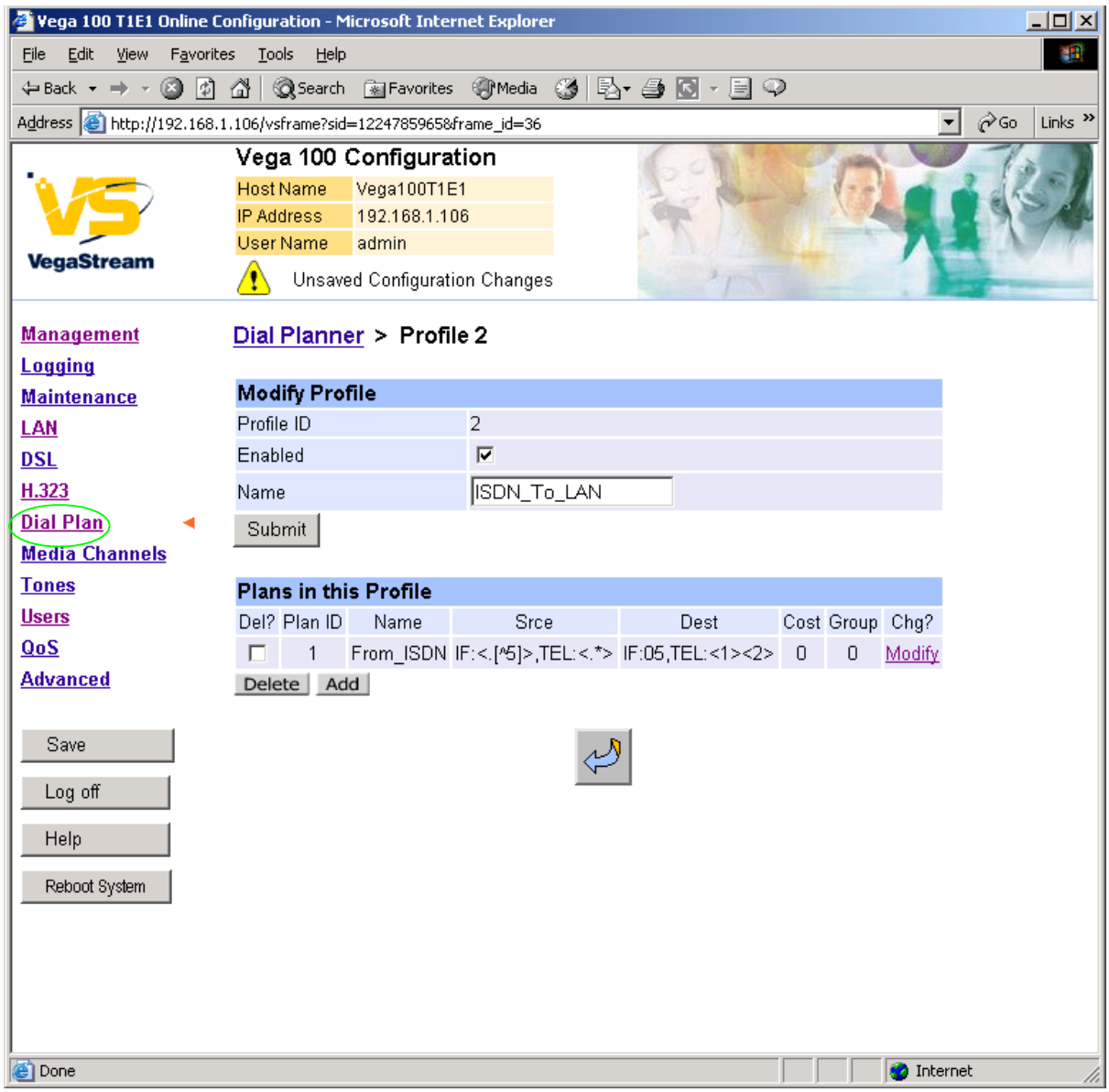


In the **Plans in this Profile** section:

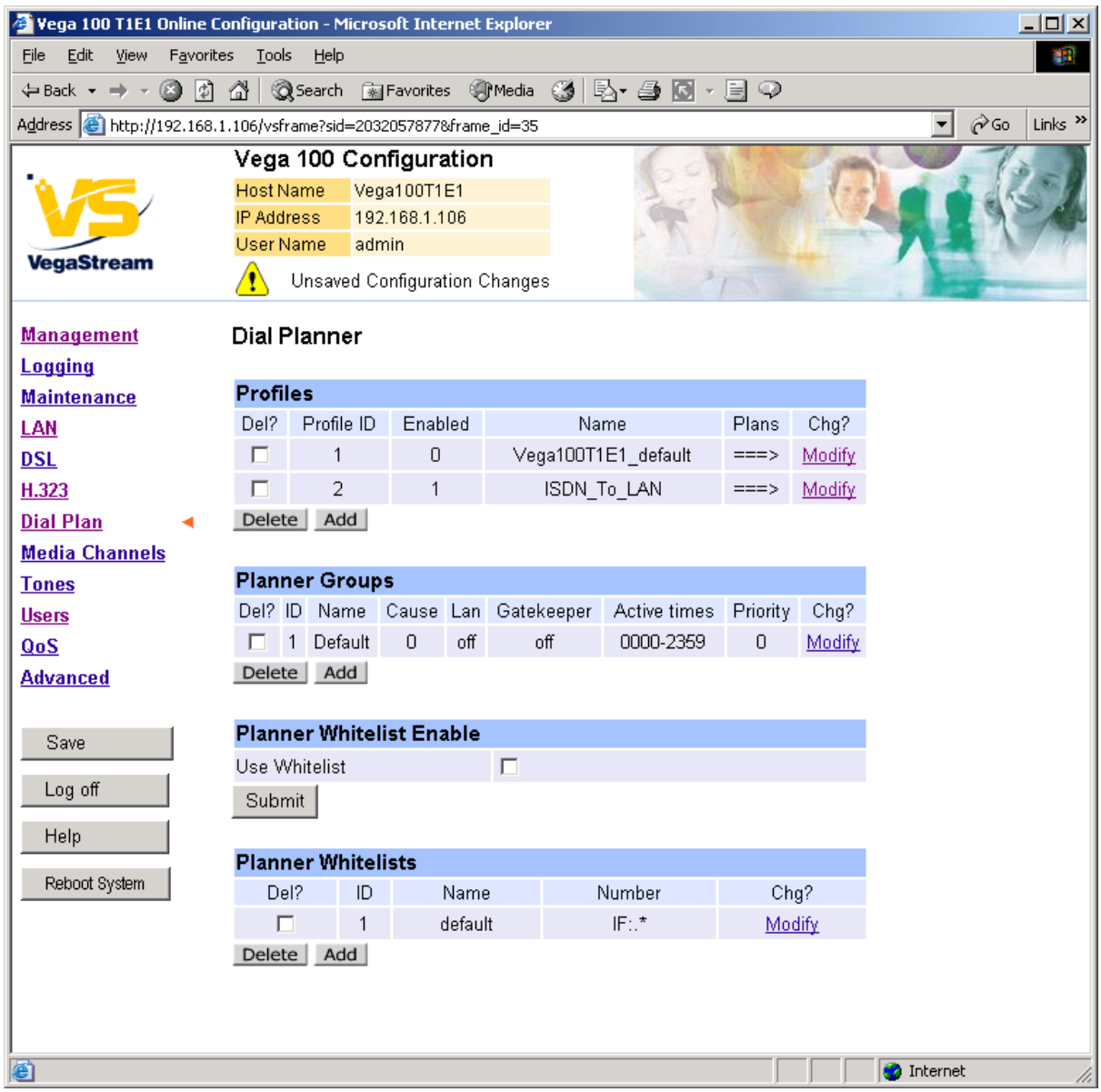
- Select Modify



- Set Name = `From_ISDN`
- Set Source = `IF:<.[^5]>,TEL:<.*>` *(This takes a call from either of the two ISDN interfaces and stores the interface number in store <1> and the telephone number presented in store <2>)*
- Set Destination = `IF:05,TEL:<1><2>` *(This routes the call to IF:05 (the LAN) and passes the received telephone number prefixed by the 2 digit received interface number, on as the destination telephone number)*
- select Apply and then click "here" to return



➢On the left hand side menu select Dial Plan



Now create a new profile and in it create a dial plan entry to handle calls being received inbound from the LAN:

In a similar manner to adding profile 2 add another profile, profile 3,

- Set Name = `LAN_to_ISDN`

Modify the first plan for Profile 3:

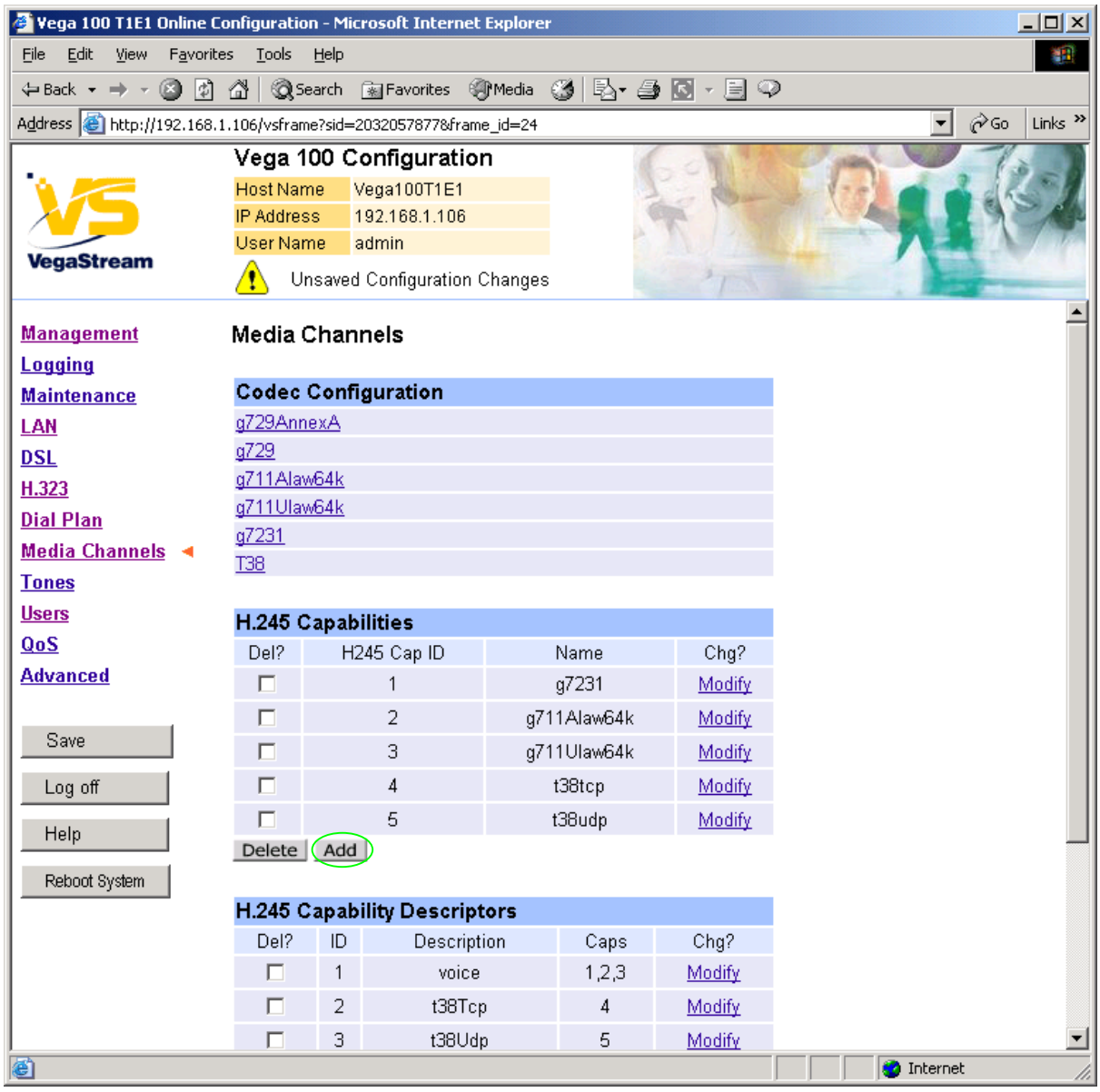
- Set Name = `From_LAN`
- Set Source = `IF:05,TEL:<..><.*>` *(For calls from IF:05 (LAN), take the first two digits presented and store them in store <1>; take any further digits and store them in store <2>)*
- Set Destination = `IF:<1>,TEL:<2>` *(The first two digits presented define the interface – 01 or 02 – and the remainder of the digits are passed on as the telephone number)*
- select Apply and then click "here" to return

Note: *In this configuration, if a call comes in on trunk 1 of the Vega, it will be routed out of trunk 1 on the partner (destination) Vega. Similarly if it comes in on trunk 2 it will be routed out of trunk 2 on the destination Vega. The incoming telephone number is passed out of the destination Vega identically to the way it was received on the incoming Vega.*

For more details on the operation of the dial planner, including the various tokens that may be used, see the section "The Dial Planner" in the Vega Primer.

7. Configure audio parameters

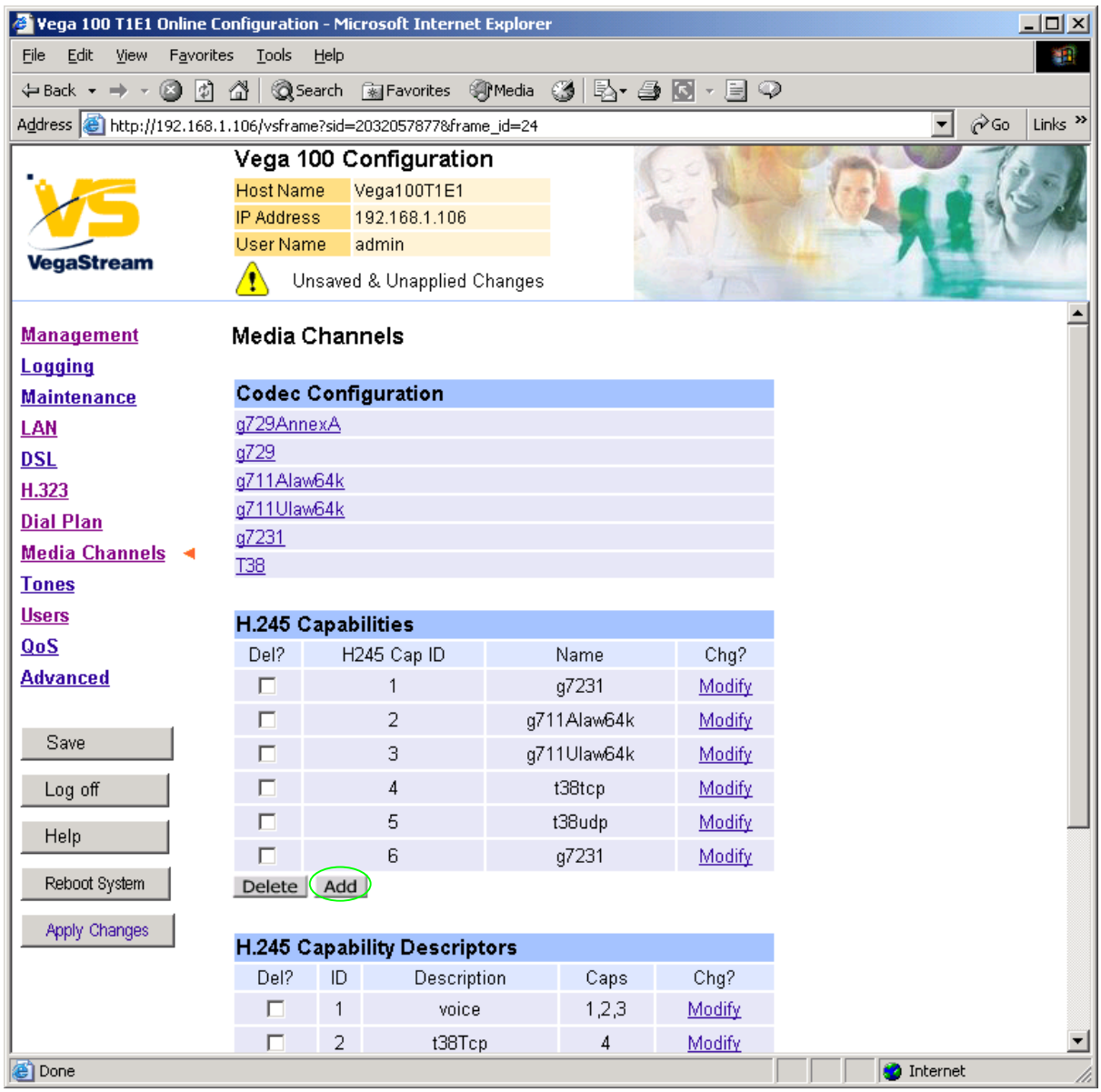
➢On the left hand side menu select Media Channels



Add 2 more codecs so that by default the Vega will handle calls with any of the codecs it supports.

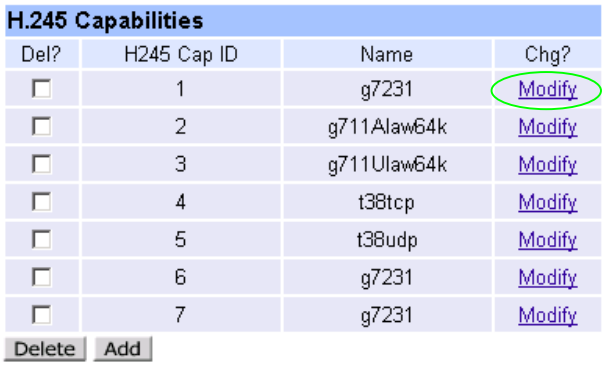
In **H.245 Capabilities**

➢ Select Add

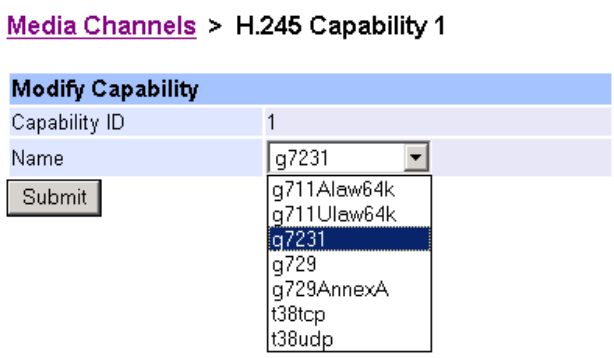


In **H.245 Capabilities**

- Select Add



- Select Modify on H245 Cap ID 1



- Select required codec type – in this case g7231
- select Submit and then click "here" to return
- Modify all H245 Cap ID entries until the list looks as follows:

H.245 Capabilities

Del?	H245 Cap ID	Name	Chg?
☐	1	g7231	Modify
☐	2	g729AnnexA	Modify
☐	3	g729	Modify
☐	4	g711Alaw64k	Modify
☐	5	g711Ulaw64k	Modify
☐	6	t38tcp	Modify
☐	7	t38udp	Modify

Delete Add

Now update the Capability Description list that tells the Vega which codecs it can use.

H.245 Capability Descriptors

Del?	ID	Description	Caps	Chg?
☐	1	voice	1,2,3	Modify
☐	2	t38Tcp	4	Modify
☐	3	t38Udp	5	Modify

Delete Add

Update entry 1 to select all voice codecs, and the other entries to configure them for the correct capability IDs.

For each capability:

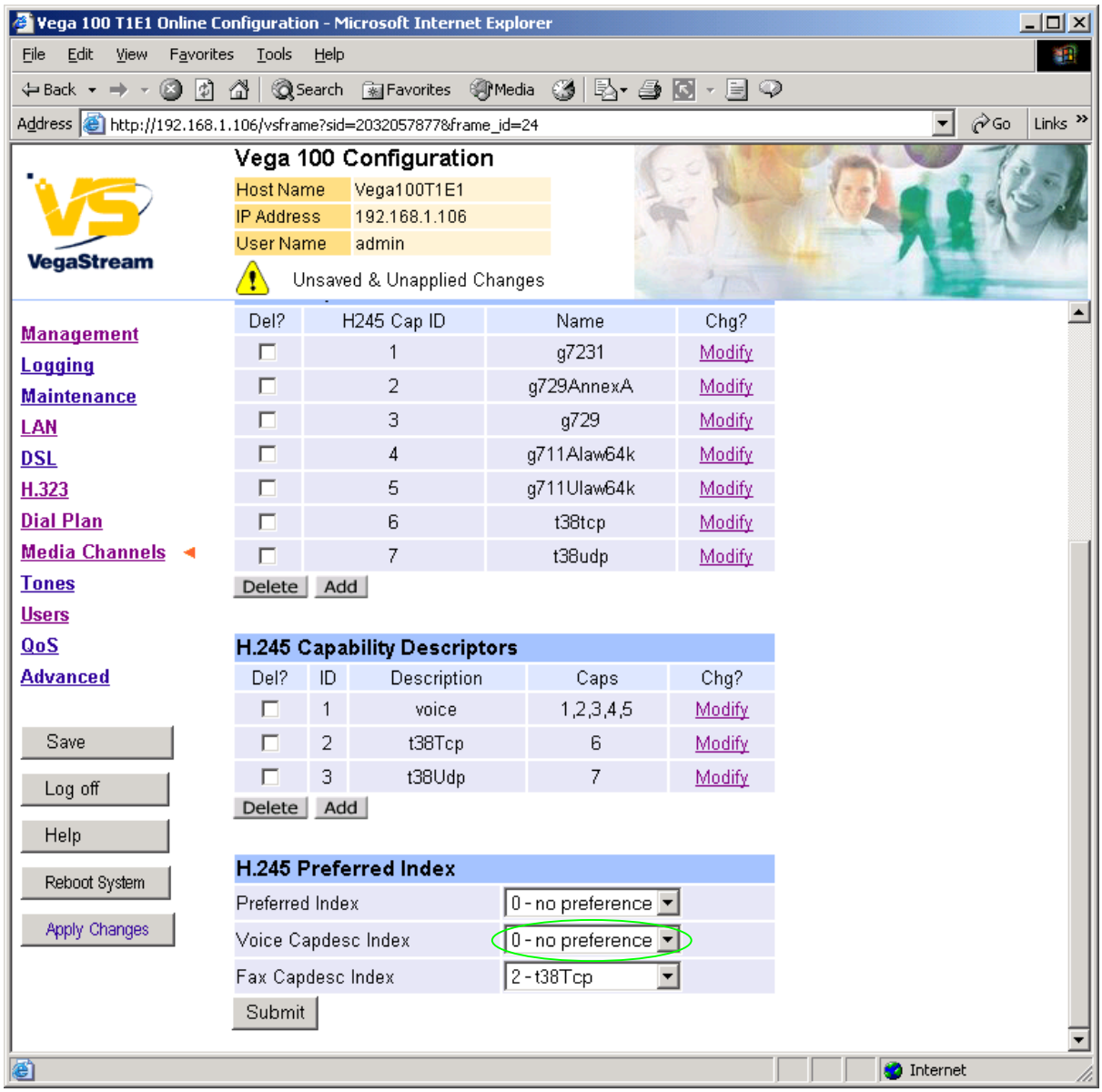
- Select Modify
- Adjust them so that they have the capabilities indicated below:

H.245 Capability Descriptors

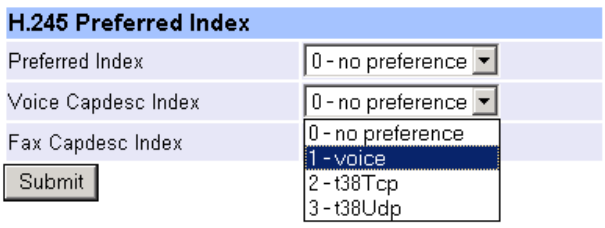
Del?	ID	Description	Caps	Chg?
☐	1	voice	1,2,3,4,5	Modify
☐	2	t38Tcp	6	Modify
☐	3	t38Udp	7	Modify

Delete Add

- Scroll to the bottom of the Media Channels page:



- Set Voice Capdesc Index to 1

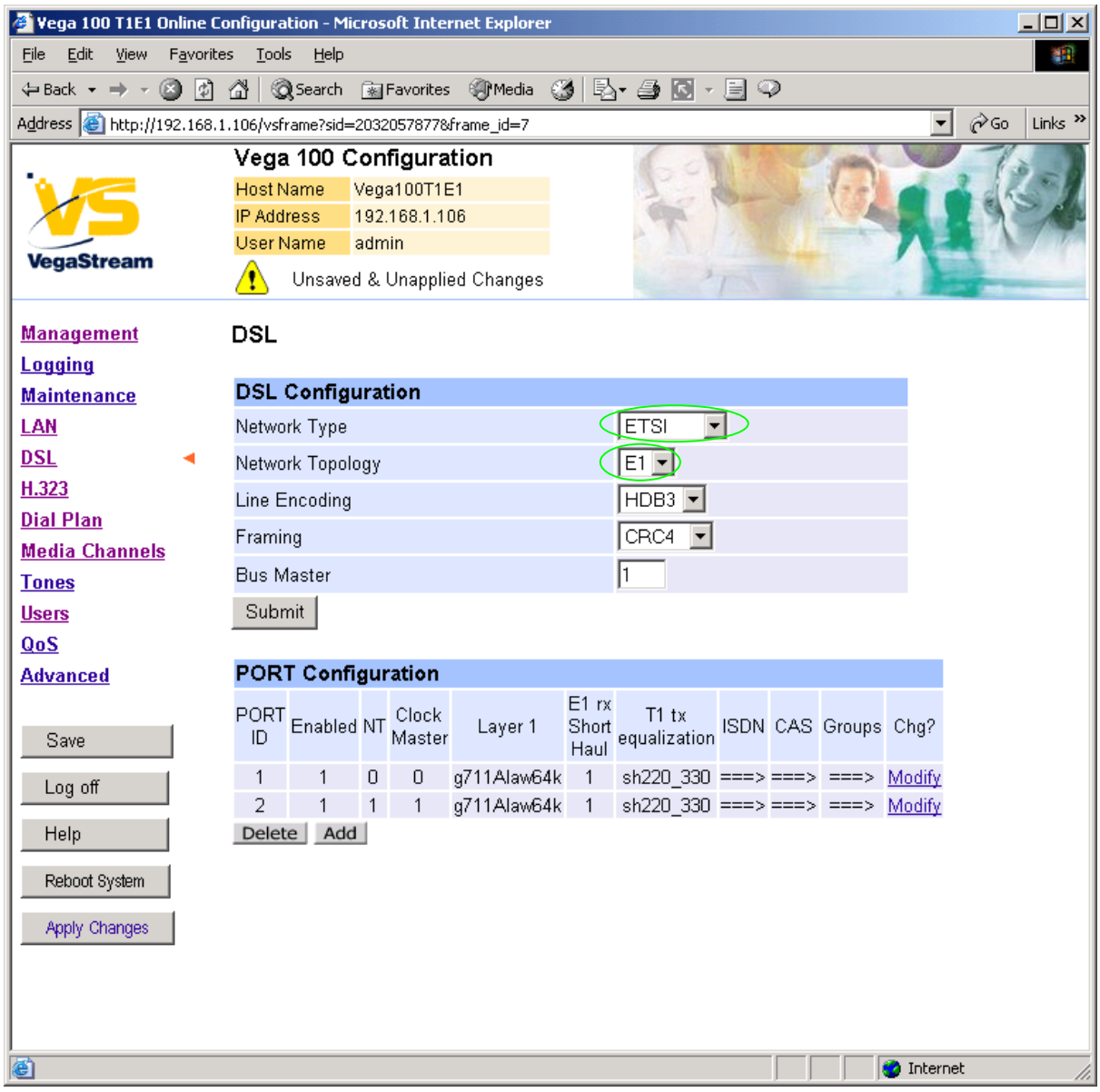


- select Submit and then click "here" to return

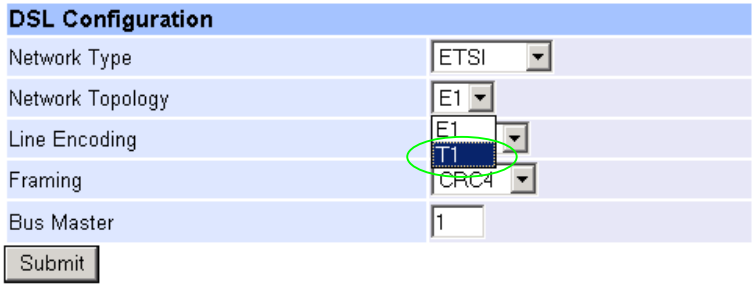
This has selected all voice codecs to be offered for all calls.
With Fax Capdesc Index set to "`2 - t38Tcp`" it has selected this codec for fax transfers. Note it is recommended that only a single T.38 codec is offered (as configured here), because if both are offered negotiations do not always complete correctly.

8. Configure DSLs

➢On the left hand side menu select DSL

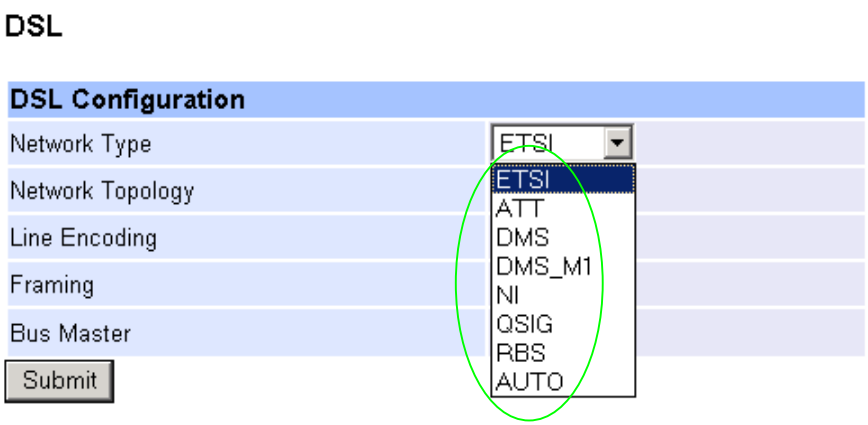


Start by selecting the correct Network Topology – T1



➢In the **DSL Configuration** section select the required Network Topology = T1

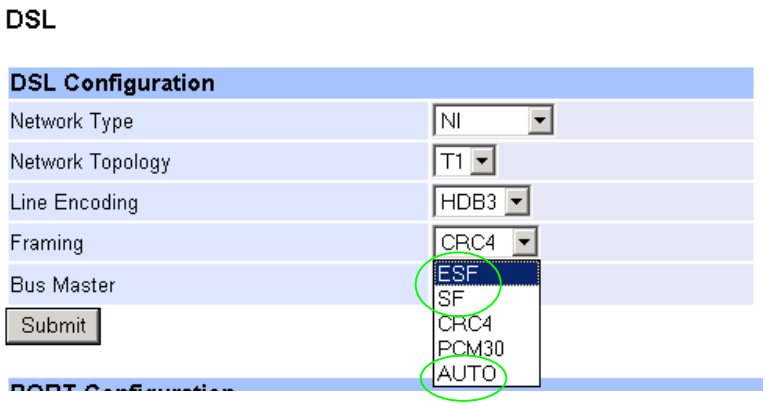
*In the **DSL Configuration** section select the Network Type as required:*



- `ATT` = 4ESS / 5ESS
- `DMS` = DMS 100
- `DMS_M1` – not supported on H.323 products
- `NI` = National ISDN NI1 / NI2
- `QSIG` = QSIG
- `RBS` = CAS RBS (Robbed Bit Signalling)
- `AUTO` = DMS 100

Note: ETSI is not supported on the T1 interface.

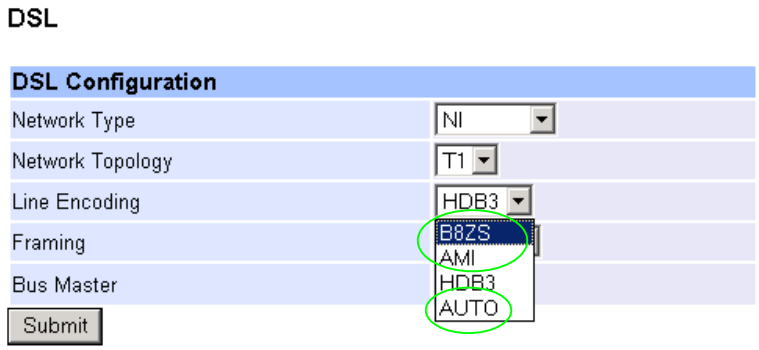
*In the **DSL Configuration** section select the Framing Method as required:*



- `ESF` = Extended Super-Frame – 16 state signaling
- `SF` = Super-Frame (also known as D4)
- `AUTO` = ESF

Note: CRC4 and PCM30 are not supported on the T1 interface

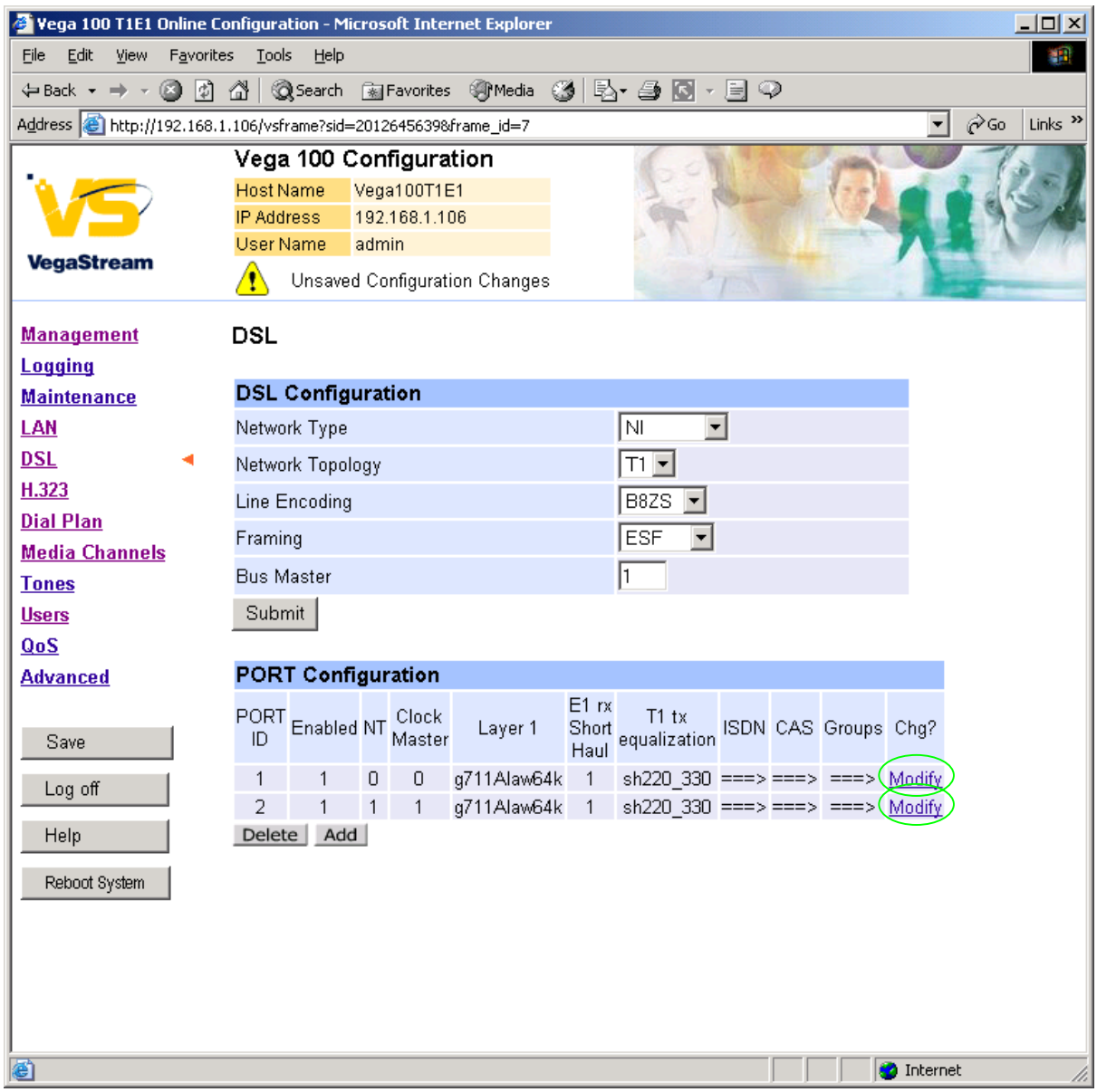
*In the **DSL Configuration** section select the Line Encoding as required:*



- `B8ZS` = Bipolar with 8 zero substitution (forces line reversals regularly)
- `AMI` = Alternate Mark Inversion
- `AUTO` = B8ZS

Note: HDB3 is not supported on the T1 interface.

➢ select Submit and then click "here" to return



For the configuration indicated in the initial diagram Port 1 and Port 2 are connection to the PSTN, and so the Vega needs both ports configured as TE (and blue booted cables used to make the connection).

Bus Master needs to be configured to point to an active TE trunk – to identify where the Vega will synchronise its internal clock from – in this configuration this can be either Port 1 or Port 2.

Port 2 needs to be converted NT to TE, but otherwise the default settings of the Vega are as required for Clock_Master and Bus_Master settings.

In the **Port Configuration** section, for Port ID 1:

➢Select Modify

Port 1

Port Configuration

Port ID	1
Enabled	☑
Network Terminator	☐
Clock Master	☐
Layer 1	g711Alaw64k
Set E1 RX short haul	☑
T1 TX equalization	sh220_330

Submit

ISDN Configuration

DTMF Termination Char	*
DTMF Dial Timeout	2
Setup Mapping	0
Cause Mapping	0

Submit

CAS Configuration

ANI	☐
DTMF Separator	*
DTMF Dial Timeout	2
Info	dtmf
Signal	em_wink
Tone Delay	50

Submit

Groups

Group ID	Interface ID	Cost Index	DN	First Channel	Last Channel	Alloc Channel	Tunnel Mode	Chg?
1	01	1	*	1	30	default	off	Modify

Delete Add

In the **Port Configuration** section, set Layer 1 = `g711Ulaw64k`, Submit, click "here"

In the **Groups in this DSL** section, set the Last Channel = `auto`, Submit, click "here"

For a CAS RBS configuration:

In the **CAS Configuration** section, set Signal to the type of CAS RBS signalling required:

- `em_wink` = E & M wink start signalling
- `loopstart` = Loop start signalling
- `gndstart` = Ground start signalling
- `fgd` = E & M wink start signalling supporting Feature Group D for transferring ANI

➢ select Submit and then click "here" to return

If any of the other Port parameters need changing, e.g. Network Terminator, alter them now.

Note: 1. if NT (Network Terminator) is ticked then typically Clock Master should also be ticked; if NT is un-ticked (TE mode) then typically Clock Master should also be un-ticked.
2. if either trunk is TE then the Bus Master value (in the ISDN Configuration section) should be set to point to the (one of the) TE trunk(s); 1 for Port 1 and 2 for Port 2.

In changes are made

- select Submit and then click "here" to return

- Repeat for the other Port (Port ID 2), including un-ticking the Network Terminator check box.

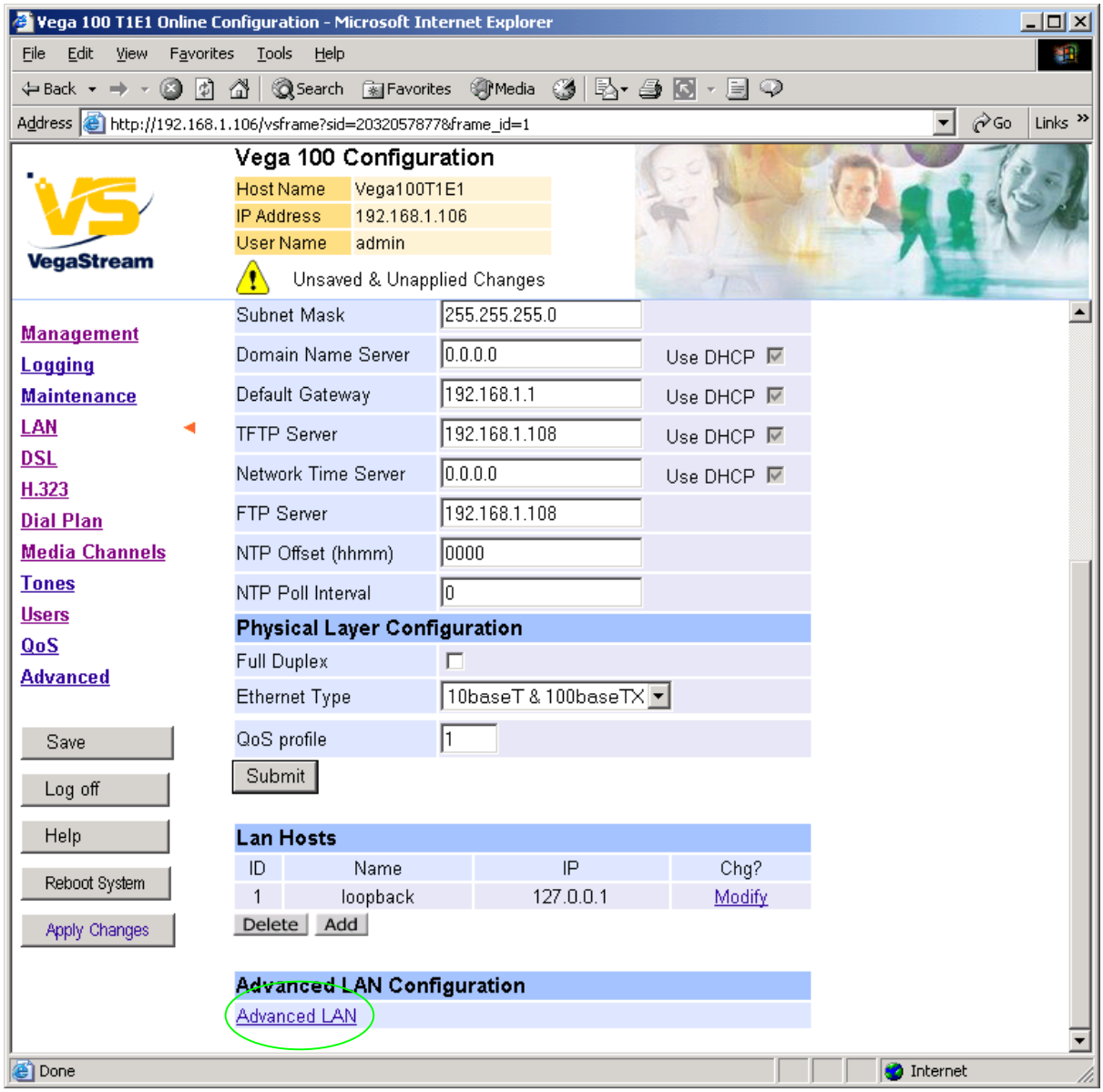
Table 1 can be used as a guide when setting up parameters for Vega 100 T1 ISDN installations.

Table 1. Network type, Line Encoding, and Topology

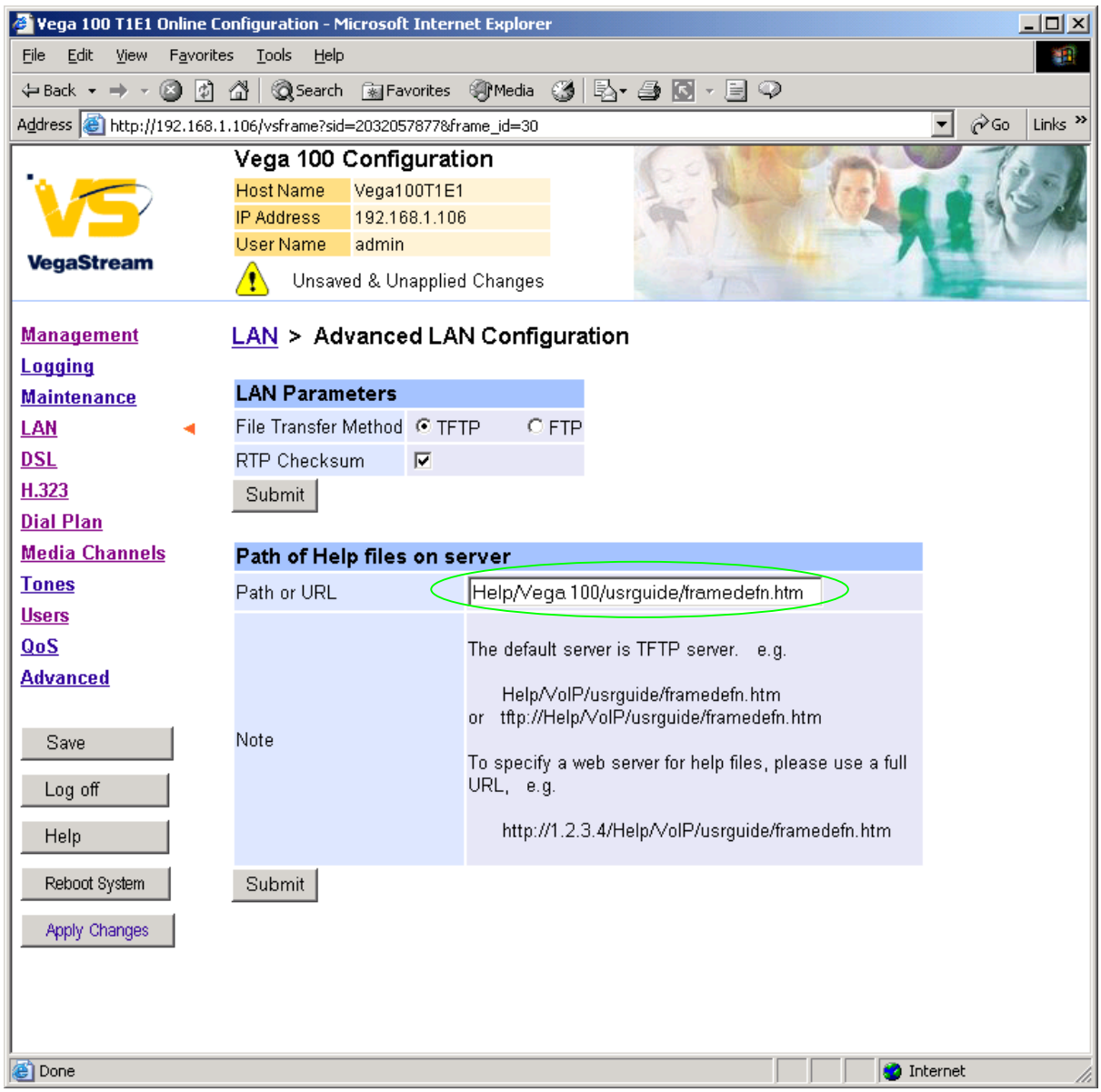
Product	Physical Connection	Network Topology	Network Type	DSLs	Framing	Line Encoding	Calls
Vega 100-PRI-T1	T1-1.544 Mbps	T1	AT&T 4ESS / 5ESS, NI 1 / NI 2, DMS-100	2	SF / ESF	B8ZS, AMI	23 / 46
Vega 100-PRI-T1	T1-1.544 Mbps	T1	QSIG	2	SF / ESF	B8ZS, AMI	23 / 46
Vega 100-PRI-T1	T1-1.544 Mbps	T1	CAS RBS	2	SF / ESF	B8ZS, AMI	24 / 48

9. Configure pointer to CD ROM documentation

➢On the left hand side menu select LAN
➢Scroll to the bottom of the screen



➢ Select Advanced LAN



To configure for operation using the CD in the local PC CD-ROM drive,

- Set Path or URL = `D:/Content/help/v100t1h_R5.htm`

… N.B. use forward slashes "/" not back slashes "\".

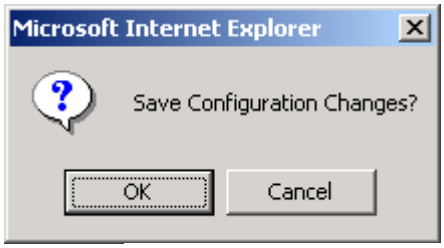
(Substitute the appropriate drive letter if D: is not the CD-ROM)

- select Submit and then click "here" to return

10. Save Changes

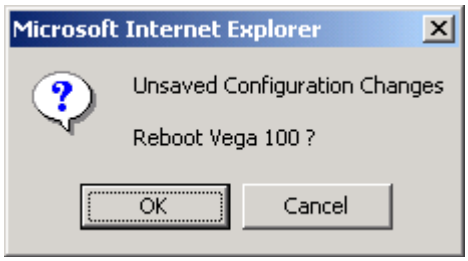
The changes to the configuration must be saved and activated. This is carried out as follows:

➢On the left hand side menu select Save



➢Select OK and after the configuration has been saved click "here" to return

➢On the left hand side menu select Reboot System



➢ Select OK

The Vega will reboot and once back on-line, it will be ready to take its first call.

11. Archive Vega Configuration

Once configured it is recommended that the configuration is archived to an external server.

To do this check that the tftp address is configured to point to a tftp server (in the LAN page), then on the left hand side menu select Advanced, and scroll to the CLI Command section:

- in the text entry box type "`PUT tftp:initial_cfg.txt`". Select Submit.

This will send all the configuration parameters to the tftp server and save them as the file "`initial_cfg.txt`". (Note: you may want to choose a unique name rather than "`initial_cfg.txt`", especially if you are configuring more than 1 unit).

The Vega configuration can be archived to an ftp server instead of a tftp server by configuring the ftp server address in the LAN page and then typing the CLI command "`PUT FTP:initial_cfg.txt`". (Again a unique name can be used in place of "`initial_cfg.txt`")

If the ftp server requires a login username and password configure the following:

- `set _advanced.lan.ftp.anonymous_login=0`
- `set _advanced.lan.ftp.username=<ftp username>`
- `set _advanced.lan.ftp._password-<ftp password>`

12. Technical Support

Support information can be found on the VegaStream Support web site www.VegaAssist.com

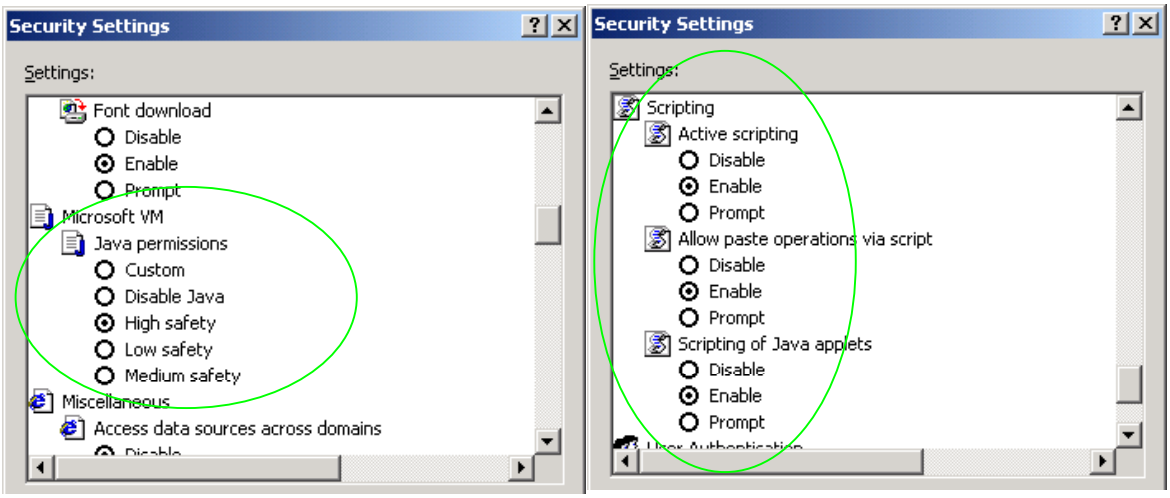
If you require help from VegaStream support personnel, please use the serial interface or telnet into the unit, log in and then type:

- `show support`
- `log display on`

Carry out the interaction you want explained, then copy the information provided by the Vega and e-mail it to support@VegaStream.com together with your question.

Notes:

1. If the screens do not appear as indicated, check that Java is enabled on your web browser (Tools>internet options>Security, select internet and custom level and configure Microsoft VM Java permissions and Scripting parameters as indicated below.



2. Where there are multiple sections – each with a Submit button – entries must be made to one section at a time, and those entries confirmed by the Submit button before the next section is altered. Each Submit button only confirms entries for its own section. Any changes in other sections will be discarded when the Submit is pressed.

3. H.323 supports two methods for transmitting call setup details. There is a standard method and then Fast Start. To allow the Vega to accept calls using the Fast Start technique ensure “Accept Fast Start” is enabled … see section 1.5

   For the Vega to initiate calls using Fast Start ensure that “Use Fast Start” is enabled … see section 1.5.

13. Advanced configuration

T1 units have further configurable parameters that may be desirable to configure in order to fully integrate into the attached infrastructure.

13.1 Web browser configurable parameters

13.1.1 Line impedance matching

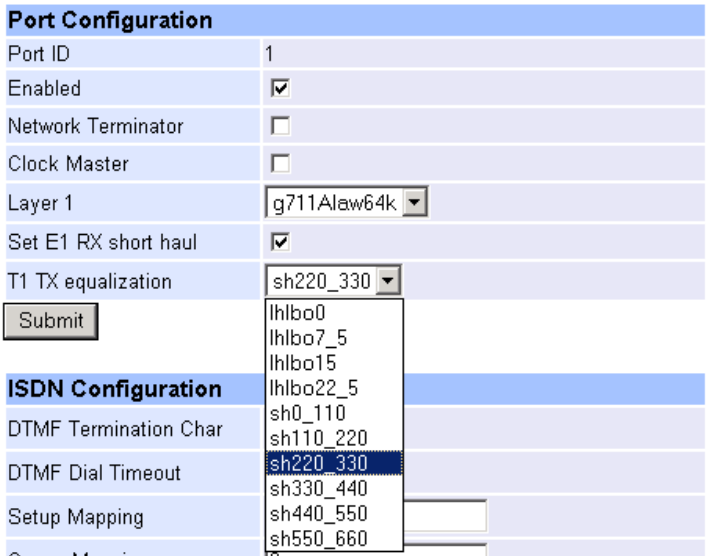
In order to match the signal shapes produced by the Vega to the T1 line it is working with there is a parameter `tx_equalisation` that can be configured:

- `set _advanced.isdn.tx_equalization=<tx_equ>`

`<tx_equ>` can take the following values:

`lhlbo0`	(long haul line break out 0 dB)	
`lhlbo7_5`	(long haul line break out -7.5 dB)	
`lhlbo15`	(long haul line break out -15 dB)	
`lhlbo22_5`	(long haul line break out -22.5 dB)	
`sh0_110`	(short haul 0-110 ft.)	
`sh110_220`	(short haul 110-220 ft.)	
`sh220_330`	(short haul 220-330 ft.)	- default setting
`sh330_440`	(short haul 330-440 ft.)	
`sh440_550`	(short haul 440-550 ft.)	
`sh550_660`	(short haul 550-660 ft.)	

on the web browser interface, in the port configuration section off the DSL page:



Long haul values are used where the distance between the Vega and the closest repeater or other ISDN endpoint is greater than 660 feet. Short haul value lengths are the distance between the Vega and the closest repeater or other ISDN endpoint.

If the appropriate test and measurement equipment is not available to check the required setting, for long haul try **lhlbo0** and for short haul try **sh220_330**.

13.1.2 Channel Allocation Strategies

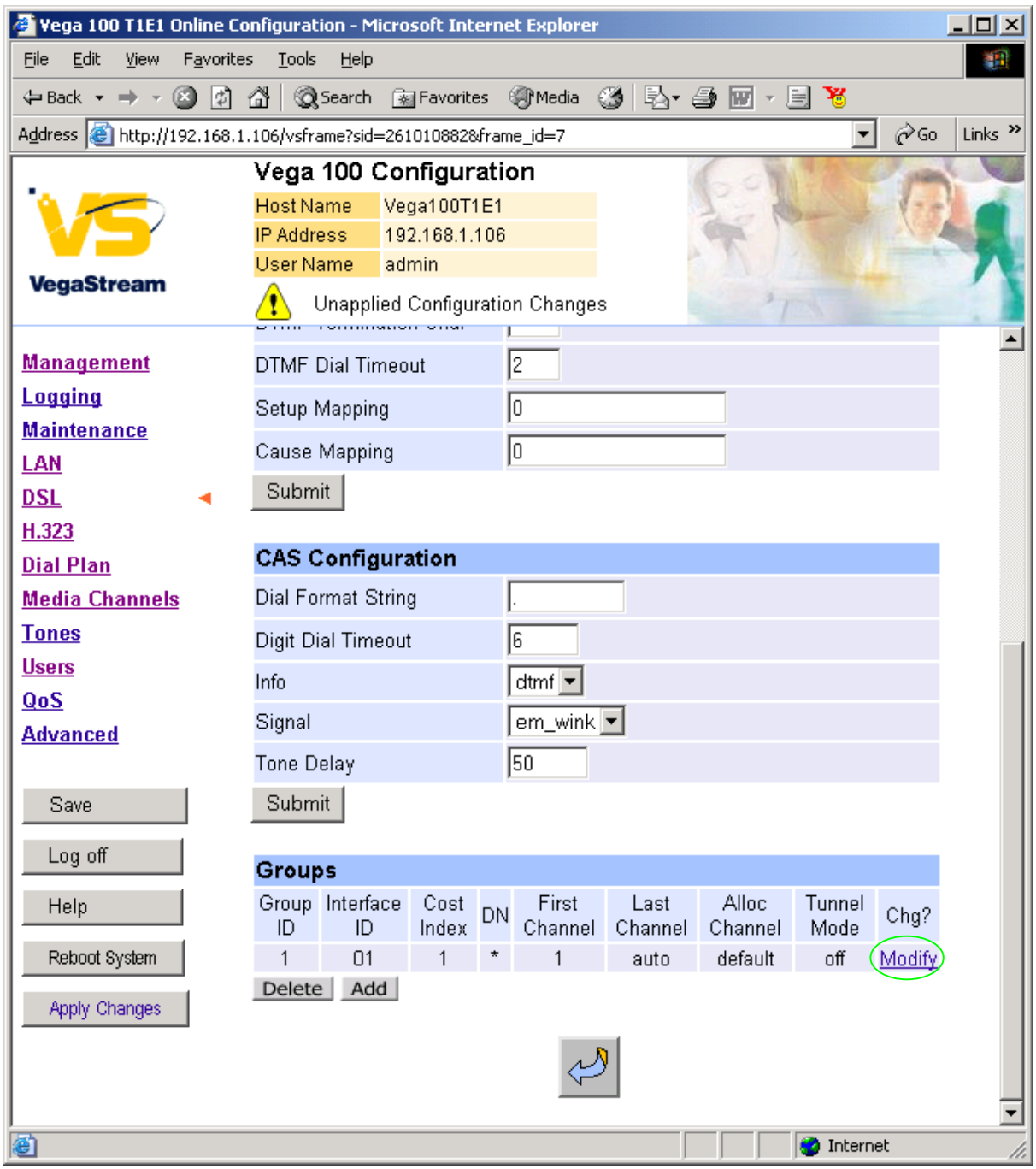
The Vega allows configuration of the channel allocation strategy to be used for each DSL on outgoing calls. Four options are available,

i) *Linear_down* – where the Vega will use the highest available free channel to make the outbound call … use this mode when the attached device is configured to make outbound calls using *Linear up.*
ii) *Linear_up* – where the Vega will use the lowest available free channel to make the outbound call … use this mode when the attached device is configured to make outbound calls using *Linear down.*
iii) *Round_robin* – in this mode the Vega remembers the last allocated channel and then tries to use the next channel up from this for the next outbound call. (After reaching the highest channel ID it restarts at the lowest channel again.) … use this mode when the attached device is configured to make outbound calls using *Round_robin* mode.
iv) *Default* – if the DSL is configured as NT then the Vega will use the *Linear_up* scheme, and if the DSL is configured as TE then the Vega will use *Linear_down*.

By default the Vega has chan_alloc set=`Default`

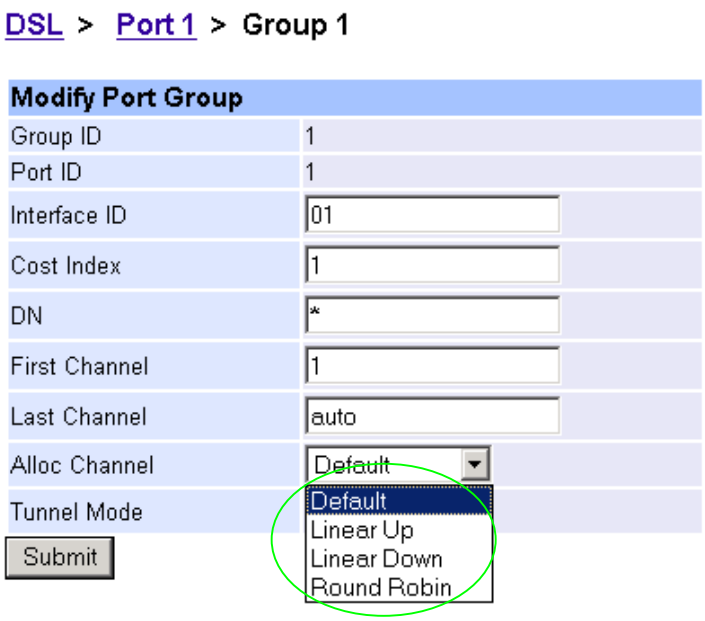
Using the web browser interface:

- On the left hand side menu select DSL
- Then select the Port to alter
- Scroll to the bottom of the page



In the Groups in this DSL:

- Select Modify



➢Select the desired channel allocation strategy from the Alloc Channel pull down.

➢select Submit and then click "here" to return

➢Save and reboot system to activate the change

13.2 Command Line Interface configurable parameters

These items must be configured using the Command Line interface available either using the serial connection or using a telnet session.

Connect to the Vega and log in.

13.2.1 End to End Call Proceeding

For H.323 to ISDN calls, by default the Vega will send the Call Proceeding message on the H.323 interface as soon as all the dialling information has been received.

It is possible to configure the Vega only to send the Call Proceeding on the H.323 interface once it has received the call proceeding from the outgoing call made on the ISDN interface – i.e. the call proceeding is passed from end to end rather than being generated by the Vega. This mode is useful when the Vega is not the end point in the telephony network, but is an intermediate carrier.

To set the Vega to support end to end call proceeding, at the CLI prompt type:

- `Set _advanced.isdn.end_to_end_call_proceeding=1`

To allow the Vega to generate the call proceeding message set this configuration parameter to 0.

- Save and reboot system to activate the change

13.2.2 User progress tones – towards ISDN interface

For ISDN to H.323 calls, by default if the Vega DSL is configured as TE it will connect media through before or at alerting so that progress tones are passed through from end to end (i.e. for the ISDN caller to hear ringback and other progress tones the audio must be received over the H.323 interface).

If it is required that the Vega generates these progress tones on the TE ISDN interface, then at the CLI prompt type:

- `Set _advanced.isdn.user_progress=1`
- Save and reboot system to activate the change

Notes:
1. If the Vega DSL is configured as NT it will always generate the call progress tones. E.g. ringback and disconnect tones.
2. Typically wait_for_connect and user_progress configuration parameters should either both set to 1 or both set to 0.

13.2.3 User progress tones – towards H.323 interface

For H.323 to ISDN calls, by default the Vega will act upon the in-band audio indicator in the alerting message and if present will connect the media path.

If it is required that the Vega should ignore the in-band audio indicator, and so not pass on the inband tone, then at the CLI prompt type:

- `Set _advanced.isdn.alert_with_progress=0`
- Save and reboot system to activate the change

If it is required that the Vega should always cut through the audio whatever the value of the in-band audio indicator, then at the CLI prompt type:

- `Set _advanced.isdn.alert_with_progress=2`
- Save and reboot system to activate the change

Further details on this and other parameters may be found in the Vega Primer.