DES-3326 Layer 3 Switch Example Layer 3 Configuration Guide.

Model: DES-3326

Firmware Version 1.00B19

OS Supported: Windows 95, Windows 98, Windows 98SE, Windows Me, Windows NT 4.0 and Windows 2000.

Introduction

This guide will help you to setup a routing function to operate between two TCPIP networks. Its important to have the latest firmware installed in the switch before embarking on the configuration. At the time of writing this document the firmware release was 1.00B19. Please visit the UK ftp site for the latest firmware releases.

ftp://ftp.dlink.co.uk

Network Configuration



Fig 1. Network Configuration.

An illustration of a typical layer 3 application is shown in fig 1. above. Two departments are segmented using layer 3 routing protocol rather than segmented at the MAC layer. The engineering department is on ports 1 & 2. The sales department is on ports 17 to 24.



Fig 2. Mix of Layer 2 & Layer 3

The example configuration can be further extended to include both layer 2 & 3 switches as shown in fig 2. The configuration is complete if PC1 can ping PC2. The DES-3326 thus has achieved the act of routing between the 2 subnets. For the purpose of this document, fig 1. above will be the reference configuration. Fig 2. is an illustration of what can be configured if layer 2 switches also exist in your network.

Configuration Procedure

Before you begin the layer 3 configuration, you will need to change the operating mode of the switch from layer 2 to layer 3. The default setting for the switch is layer 2. To do this, attach to the switch through its RS232 console port with HyperTerminal and login onto the switch. The default username and password is **no username and no password**, simply press

return - return. You will be presented with the main menu options as shown in fig 3.

Command Prompt - telnet 212.125.87.10	D1	
VLAN Menu		Layer 3 Switch
Edit 802.1Q VLANs		
Configure 802.1Q Port Setting	gs	
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Function:Configure IEEE802.10	VLAN settings.	
CTRL+T = Root screen	Esc=Prev. screen	CTRL+R = Refresh

Fig 3. Switch Main Menu

Select from the main menu 'Switch Settings'

Command Pro	ompt - te	elnet 21	2.125.	87.101									_ 🗆 ×
Configure	802.1	Q Por	t Set	tings							La	yer 3	Switch
Module: <ba PVID [2</ba 	Module: <base unit=""/> Configure Port from [1 ] to [2 ] PVID [2 ] Ingress Filter: <off> GVRP:<off> GMRP:<off> APPLY</off></off></off>												
Port	1	2	3	4	5	6	7	8	9	10	11	12	13
PUID Ingress GURP GMRP	2 Off Off Off	2 Off Off Off	1 Off Off Off										
Port	14	15	16	17	18	19	20	21	22	23	24	<b>S1P1</b>	S1P2
PUID Ingress GURP GMRP	1 Off Off Off	1 Off Off Off	1 Off Off Off	3 Off Off Off	1 Off Off Off	1 Off Off Off							
*******	*****	*****	****	*****	*****	*****	*****	*****	****	*****	****	*****	******
Function:Ent Message:	ter VI	D(1-4	094).										
CTRL+T = Roc	ot scr	een			Esc=P	rev.	scree	n			CTRL	+R = ]	Refresh 🔻

Fig 4. Switch Settings Menu

From the switch settings menu select 'Switch Operating Mode'

🔍 Comm	and Prompt - telnet 2	212.125.87.10	1					_ 🗆 ×
Edit	802.1Q VLANs					]	Layer 3 S	witch 📤
Actio	on: <add modify<br="">Port</add>	> VID:[2 <u>1 to 8</u>	] ULAN 9 to 16	Name:[212 17 to 24	\$1P1	] Tota S1P2	al Entrie:	s:3
Membe Taggi	ership (E/F/-): ing (U/T) :	CEE CUUTTTTTT 	][ ][TTTTTTTTT 	-][  ][TTTTTTTTT  ][TTTTTTTTTT	] [-] ] [T] 	[-] [T] 		APPLY
VID	VLAN Name	1 to 8	9 to 16	17 to 24	\$1P1	S1P2		
1	DEFAULT_VLAN		EEEEEEEE	  TTTTTTTT	E	E		
2	212	EE			U - T	- -		
3	192			EEEEEEEE	1 			
		TITITI		00000000	T	I		
******		*****	*****	*****	*****	******	*******	*****
Functio Message	on : : :							
Esc= Pr	revious screen	CTRL+R= R	efresh CT	'RL+N= Next	Page	CTRL+P=	Previous	Page

Fig 5. Switch Operating Mode

Using the space bar change the operating mode from layer 2 to 'IP Routing, support IEEE 802.1Q VLANs' as in fig 5. Apply the changes, the switch will reboot. Reattach to the switch through HyperTerminal. Please note, you do not need to change any of the configuration parameters in the 'Remote management setup' leave them at there default settings, fig 6.

Command Prompt - telnet 212.125.87.101	
DES-3326 Local	Management Layer 3 Switch
Main	Menu
Basic Setup:	Advanced Setup:
Switch Information Remote Management Setup Switch Settings Configure Ports Setup User Accounts Serial Port Settings Utilities Network Monitoring Save Changes Reboot Logout	Spanning Tree Forwarding Filtering Priority Mirroring Multicasting ULANs Link Aggregation Layer 3 IP Networking
*****	*******
Function:Setup IP netowrking. Message:	
For Help, press F1	

Fig 6. Remote Management Settings

After you have completed the above. Proceed to the next stage of the configuration, that is to configure the VLAN's.

Command Prompt - telnet 212.125.87.101	
DES-3326 Loca	1 Management Layer 3 Switch 🚔
Mad	n Menu
Basic Setup:	Advanced Setup:
Switch Information Remote Management Setup Switch Settings Configure Ports Setup User Accounts Serial Port Settings Utilities Network Monitoring Save Changes Reboot Logout	Spanning Tree Forwarding Filtering Priority Mirroring Multicasting <u>UMANS</u> Link Aggregation Layer 3 IP Networking
**************************************	*********************************
Message:	
FOR HEID, PRESS FI	

Fig 7. Main Menu

From the main menu select 'VLAN's'

Command Prompt - telnet 212.125.8	7.101		
VLAN Menu		Layer 3	Switch
Edit 802.1Q VLANs			
Configure 802.19 Port Sett	ings		
**************************************	**************************************	*******	******
Message: CTRL+T = Root screen	Esc=Prev. screen	CTRL+R = 1	Refresh
			-

Fig 8. VLAN Menu

Select 'Configure 802.1Q Port Settings'. You will need to configure the port VLAN ID (PVID) before configuring the 802.1Q VLAN's. The default PVID for all ports is set to 1. For setting up VLAN's for the engineering department use PVID=2, for sales use PVID=3 as shown in Fig. 9.

Command Pre	ompt - te	elnet 21	2.125.	87.101									
Configure	802.1	Q Por	t Set	tings							La	yer 3	Switch
Module: <ba PVID [2</ba 	Module: <base unit=""/> Configure Port from [1 ] to [2 ] PVID [2 ] Ingress Filter: <off> GURP:<off> GMRP:<off> APPLY</off></off></off>												
Port	1	2	3	4	5	6	7	8	9	10	11	12	13
PVID Ingress GURP GMRP	2 Off Off Off	2 Off Off Off	1 Off Off Off										
Port	14	15	16	17	18	19	20	21	22	23	24	\$1P1	S1P2
PVID Ingress GURP GMRP	1 Off Off Off	1 Off Off Off	1 Off Off Off	3 Off Off Off	1 Off Off Off	1 Off Off Off							
*********** Function:Ent Message:	**************************************												
CTRL+T = Roc	ot scr	een			Esc=P	rev.	scree	n			CTRL	+ <u>R</u> = ]	Refresh 👻

Fig 9. 802.1Q Port Settings

After the above is completed your ready to configure the 802.1Q VLAN's. Go to the previous menu and select 'Edit 802.1.Q VLAN's'.

🔍 Comm	and Prompt - telnet 2	12.125.87.10						_ 🗆 ×			
Edit	802.1Q VLANs						Layer 3 St	witch			
Actio	on: <add modify<br="">Port</add>	> VID:[2 1 to 8	] VLAN 9 to 16	Name:[212 17 to 24	\$1P1	] Tota S1P2	al Entrie:	s:3			
Membe Taggi	Membership (E/F/-): [[]][][][-] [-] Tagging (U/T) : [UUTTTTTT][TTTTTTTTTTTTTTTTTTTTTTTTTTTT										
VID	VLAN Name	1 to 8	9 to 16	17 to 24	\$1P1	\$1P2					
1	DEFAULT_VLAN		EEEEEEE	  TTTTTTTT	E	E					
2	212	EE			U 	U 					
3	192	UUTTTTTT 		TTTTTTTT EEEEEEEE	Т —	<u>T</u>					
		TTTTTTTT	TTTTTTTT	UUUUUUUUU	Τ	Τ					
*****	*****	******	******	******	*****	*******	*******	*****			
Functio	in :										
Esc= Pr	evious screen	CTRL+R= R	efresh CT	RL+N= Next	Page	CTRL+P=	Previous	Page			

Fig 10. 802.1Q VLAN's

For the VID use the same number as used for the PVID previously. You will need to leave the default VLAN as is, ie do not change the default VID. Use the TAB key to cursor to the VID and enter '2', again use the TAB key to cursor to VLAN name and enter an appropriate name. In this example we have the first octet of the IP adress. Under the membership, 'Egress' the port by selecting E. You will need to Egress all the port members of this VLAN. In this example only ports 1 & 2 are members. In the Tagging section, select 'U' for Untag. This is so because adapters connected to these ports may not be Tag compliant. Repeat the procedure for the second subnet.

Your now ready to configure you layer 3 routing configuration within the switch. From the main menu select layer 3 IP Networking, then select 'Setup IP Interface'

Command Prompt - telnet 212.125.87.101	
DES-3326 Loca	1 Management Layer 3 Switch
Mai	n Menu
Basic Setup:	Advanced Setup:
Switch Information Remote Management Setup Switch Settings Configure Ports Setup User Accounts Serial Port Settings Utilities Network Monitoring Save Changes Reboot Logout	Spanning Tree Forwarding Filtering Priority Mirroring Multicasting VLANs Link Aggregation Layer 3 IP Networking
	*************************************
Message:	
For Help, press F1	<b>_</b>

Fig 11. Layer 3 IP Networking

Command Prompt - telnet 212.125.87.101			
Setup IP Interface		L	ayer 3 Switch 📥
Action: <add modify=""> Interface Name:[192 ] IP Address :[<mark>192.168.0.250 ]</mark> Subnet Mask:[255.255.255.0 ]</add>	VID:[3 Active: To	] <yes> tal IP Interface:</yes>	3 APPLY
Interface Name: System IP Address : 10.90.90.90 Subnet Mask: 255.0.0.0 VID : 1 Active : Yes	1 to 8 9 MMMMMM MM	to 16 17 to 24 MMMMMM	S1P1 S1P2 M M
Interface Name: 192 IP Address : 192.168.0.250 Subnet Mask: 255.255.255.0 VID : 3 Active : Yes	1 to 8 9 	to 16 17 to 24 MMMMMMMM	\$1P1 \$1P2 
Function: Message: Esc= Previous screen CTRL+R= Re	efresh CTRL+N= Ne	xt Page CTRL+P= 1	Previous Page

Fig 12. IP Interface Setup

Once again in this example we have used the fist octet for the interface name. The IP address is the IP address of the the switch in that particular subnet, we have choosen 192.168.0.250 MASK 255.255.255.0. The VID is the PVID set in the VLAN configuration previously done. After the config is applied, the screen will show you the configuration as in fig 12.

Command Prompt - telnet 212.125.87.	101					- 🗆 ×
Setup IP Interface				L	ayer 3 Sw:	itch 🔺
Action: <add modify=""> Interface Name:[200 IP Address :[200.10.20.250 Subnet Mask:[255.255.255.0</add>	] ] ]	VID: Acti	[3 ] ve: <yes> Total IP</yes>	Interface:	3 39	
Interface Name: System IP Address : 10.90.90.90 Subnet Mask: 255.0.0.0 VID : 1 Active : Yes		1 to 8 MMMMMM	9 to 16 MMMMMMMMM	17 to 24	S1P1 S1P2 M M	2
Interface Name: 192 IP Address : 192.168.0.250 Subnet Mask: 255.255.255.0 VID : 3 Active : Yes		<u>1 to 8</u>	9 to 16	17 to 24 MMMMMMMM	S1P1 S1P2	2
Function: Apply the settings.	*****		~~~~~			
Message:	D C	1 OTDI AL	N A	OTDL . D		
Esc= Previous screen CIRL+R=	Kerres	sh GIRL+N=	Next Page	e CIRL+P=	Previous I	'age ▼

Fig 13. Subnet 192 Config

🖼 Select Command Prompt - telnet 212.125.87.10	11										
Setup IP Interface									L	ayer :	3 Switch
Action: <add modify=""> Interface Name:[212 ] IP Address :[2<mark>12:125:87.101]</mark>] Subnet Mask:[255.255.255.128]</add>		U A	ID: cti	[2 ve: To	] <ye: tal</ye: 	\$> 1P	Inte	erf	ace:	3	APPLY
Interface Name: 212	1	to	8	9	to	16	17	to	24	 \$1P1	\$1P2
IP Address : 212.125.87.101 Subnet Mask: 255.255.255.128 VID : 2 Active : Yes	MM-										-
Interface Name: IP Address : Subnet Mask:	1	to	8	9	to	16	17	to	24	\$1P1	\$1P2
VID : Active :											
function:	****			***	***	*****			****	*****	*******
Tessage= Esc= Previous screen CTRL+R= Refres	sh (	CTRL	,+N=	Ne	xt ]	Page	e Ci	<b>FRL</b>	+P=	Previ	ous Page

Fig 14. Subnet 212 Config

Ensure all the configurations have been applied, check the IP interfaces addresses. If all looks okay return to the main menu and save the configuration.

Command Prompt - telnet 212.125.87.101	
DES-3326 Loc	al Management Layer 3 Switch
Ma	in Menu
Basic Setup:	Advanced Setup:
Switch Information Remote Management Setup Switch Settings Configure Ports Setup User Accounts Serial Port Settings Utilities Network Monitoring Save Changes Reboot Logout	Spanning Tree Forwarding Filtering Priority Mirroring Multicasting VLANs Link Aggregation Layer 3 IP Networking
***************************************	
Function:Save changes. Message:	
For Help, press F1	

Fig. 15 Save Configuration

#### How to Test the Configuration

To test the configuration, do a ping test from a PC on the 192 subnet to a PC on the 200 subnet. If succesful, the layer configuration is complete. If the ping test produces a 'request timed out' check the configuration above more carefully. You may need to perform a factory reset and re-config the switch.

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