IPSEC VPN with CALLBACK (IP-ADDRESS IN B/D CHANNEL)

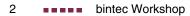
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Purpose	This document is part of the user's guide to the installation and configuration of bintec gateways run- ning software release 7.1.4 or later. For up-to-the-minute information and instructions concerning the latest software release, you should always read our Release Notes , especially when carrying out a software update to a later release level. The latest Release Notes can be found at www.bintec.net.		
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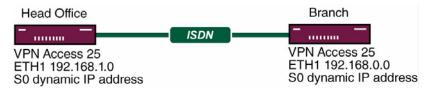
1 Introduction

The configuration of IPSec callback with IP address transfer in the B/Dchannel is described in the following chapters using two Bintec VPN Access 25 gateways (software version 7.1.6 patch 3).

This feature has only been available since firmware version 7.1.4. It enables dynamically assigned IP addresses to be transferred in the B-/D-channel.

1.1 Scenario

A branch office of a company is to be connected to the head office over an IPSec tunnel. An ISDN connection is available for the Internet connection in both the branch office and head office. Both devices receive their IP address dynamically from the ISP.



1.2 Requirements

- Two Bintec VPN Access 25 gateways.
- At least firmware version 7.1.4.
- An ISDN S0 connection per Bintec VPN Access 25 gateway.
- Connect your LAN to the ETH1 interface of your gateway.
- ISDN Internet connection.



2 Configuration of ISDN Interface

You must configure "Incoming Call Answering" so that for a call to a certain number, this is used for ISDN callback.

```
■ Go to ISDN S0 → INCOMING CALL ANSWERING → ADD.
```

VPN Access 25 Setup Tool	Bintec Access Networks GmbH
[SLOT 0 UNIT 4 ISDN BRI][INCOMING][E	2DIT] vpn25
Item	IPSec
Number	100
Mode	right to left
Bearer	any
SAVE	CANCEL
Use <space> to select</space>	

The following fields are relevant:

Field	Meaning
Item	Service for which this number is to be used.
Number	Number for the service.
Mode	Type of number check.
Bearer	Is to respond to a voice or data call or both.

Table 2-1: Relevant fields in ISDN S0 -> INCOMING CALL ANSWERING -> ADD

Proceed as follows to define the necessary settings:

- Set ITEM to IPSec.
- Enter the desired number under **NUMBER**, e.g. 100.
- Set **Mode** to right to left.

Note

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If your gateway is connected to a point-to-point ISDN connection, it may be necessary to set to *left to right*!

- Set **BEARER** to any.
- Press **SAVE** to confirm your settings.

You have now configured the gateway for using calls via the number 100 for IPSec.

3 Configuration of Internet Connection (WAN Partner)

Use the Bintec manual or Bintec FAQs for this configuration.



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4 Configuration of IPSec Connection

This workshop describes the relevant configuration steps for ISDN callback. A more detailed description of configuring an IPSec connection can be found in the Bintec User's Guide or the relevant FAQs.

4.1 Configuration of IPSec Peer

Go to IPSEC -> CONFIGURE PEERS -> APPEND.

VPN Access 25 Setup Tool Bintec Access Networks GmbH [IPSEC] [PEERS] [EDIT] : Configure Peer vpn25 Description: Branch office Admin Status: up Oper Status: dormant Peer Address: Peer IDs: Branch office Pre Shared Key: IPSec Callback > Peer specific Settings > Virtual Interface: yes Interface IP Settings > CANCEL SAVE Enter string, max. length = 255 chars

The following fields are relevant:

Field	Meaning
Description	Freely selectable description of peer.
Peer Address	IP address of remote terminal.
Peer IDs	Identity (name) of remote terminal.
Pre Shared Key	Secret key for IPSec negotiation.

Field	Meaning
Virtual Interface	Virtual interfaces can be used.

Table 4-1: Relevant fields in **IPSEC ->** CONFIGURE PEERS -> APPEND

Proceed as follows to define the necessary settings:

- Enter a name under **PEER ADDRESS**, e.g. branch office.
- Enter a **Pre Shared Key**, e.g. test.
- Set VIRTUAL INTERFACE, e.g. yes.
- Press SAVE to confirm your settings.



The **PRE SHARED KEY** should be at least 25 to 30 characters long in actual operation and not contain any known words or number combinations. A random sequence of upper and lower case letters, numbers and special characters should preferably be used.

You have now completed the basic configuration of an IPSec peer.

4.2 Configuration of Virtual Interface

Go to IPSEC → Configure Peers → Relevant Peer → Interface IP Settings → Basic IP Settings.

VPN Access 25 Setup Tool [IPSEC] [PEERS] [EDIT] [IP] [BASIC] :	Bintec Access Networks GmbH IP Settings (Head Office) vpn25	
IP Transit Network	no	
Local IP Address	192.168.1.1	
Default Route	no	
Remote IP Address Remote Netmask	192.168.0.0 255.255.255.0	
SAVE	CANCEL	
Use <space> to select</space>		

The following fields are relevant:

Field	Meaning
IP Transit Network	Is a transit network to be used?
Local IP Address	Local IP address of virtual interface.
Default Route	Is the virtual interface to be used as default gateway?
Remote IP Address	IP address or network to be reached over the tunnel.
Remote Netmask	Netmask of host or network.

Table 4-2: Relevant fields in IPSEC → CONFIGURE PEERS → RELEVANT PEER → INTERFACE IP SETTINGS → BASIC IP SETTINGS

Proceed as follows to define the necessary settings:

- Set **IP TRANSIT NETWORK** to no.
- Enter your local IP address under *Local IP Address*, e.g. 192.168.1.1.
- Set **DEFAULT ROUTE** to no.
- Enter the network address of the remote terminal under **REMOTE IP ADDRESS**, e.g. 192.168.0.0.

- Enter the netmask of the remote terminal under **REMOTE NETMASK**, e.g. 255.255.255.0.
- Press **SAVE** to confirm your settings.

■ Go to **IP** → **ROUTING**.

VPN Access 25 [IP][ROUTING]	-	1	Bintec Acces	s Networks GmbH vpn25
The flags are	G (Gateway Ro	ormant), B (Bloch Dute), I (Interfa ute), H (Host Rom	ace Route),	ended Route)
	192.168.1.1	Mask 255.255.255.0 255.255.255.0 0.0.0.0	0 DG 0	
ADD	ADI	DEXT	DELETE	EXIT
Press <ctrl-n>, <ctrl-p> to scroll, <space> tag/untag DELETE, <return> to edit</return></space></ctrl-p></ctrl-n>				

You can see that an additional entry has been created in the routing table. This enables the network 192.168.0.0 to reach the branch office over the IPSec interface.

You have now configured a virtual IPSec interface, over which a remote network can be reached.

4.3 Configuration of ISDN Callback Mechanism

■ Go to IPSEC → Configure Peers → IPSec Callback.

VPN Access 25 Setup Tool Bintec Access Networks GmbH [IPSEC] [PEERS] [EDIT] [CALLBACK]: ISDN Callback Peer vpn25 (Head Office) ISDN Callback: both Incoming ISDN Number:101 Outgoing ISDN Number:101 Transfer own IP Address over ISDN: yes Mode : autodetect best possible mode (D or B channel) SAVE CANCEL Use <Space> to select

The following fields are relevant:

Field	Meaning
ISDN Callback	Activates or deactivates ISDN callback.
Incoming ISDN Number	Number that arrives when the peer initiates the callback.
Outgoing ISDN Number	Number that is dialed when an ISDN callback is initiated.
Transfer own IP Address over ISDN	Determines whether the IP address is transferred over ISDN or not.
Mode	Determines how the IP address is transferred over ISDN.

Table 4-3: Relevant fields in IPSEC -> CONFIGURE PEERS -> IPSEC CALLBACK

Proceed as follows to define the necessary settings:

- Set **ISDN CALLBACK** to both.
- Enter the number coming from the remote terminal under INCOMING ISDN NUMBER, e.g. 101.
- Enter the number on which the remote terminal can be reached under OUTGOING ISDN NUMBER, e.g. 101.

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- Set Transfer own IP Address over ISDN to yes.
- Set MODE to autodetect best possible mode (D or B channel).
- Press SAVE to confirm your settings.



If you wish to transfer the IP address only in the D-channel, you must ensure that LLC (Low Layer Compatibility) and/or SUBADDR (SubAddress) are transferred over the ISDN network. If this is not the case, you must switch to transmission in the B-channel. You should therefore set the *MoDE* to *autodetect best possible mode (D or B channel)*, as a B-channel is set up as an alternative if D-channel transmission fails.

You have now activated the ISDN callback mechanism, so that both ends can transfer their IP addresses to set up an IPSec tunnel.

4.4 Configuration of Parameters for IPSec Phase 1

Go to IPSEC → IKE (PHASE 1) DEFAULTS → EDIT.

Select the desired configuration, e.g. *autogenerated*.

VPN Access 25 Setup Tool [IPSEC][PHASE1][EDIT]	Bintec Access Networks GmbH vpn25
Lifetime Group Authentication Method Mode Heartbeats Block Time	<pre>: 1 (Blowfish/MD5) : use default : 2 (1024-bit MODP) : Pre Shared Keys : id_protect : none : 0 : Head Office : none : :</pre>
SAVE	CANCEL
Enter string, max. length = 255 chars	

The following field is relevant:

Field	Meaning
Mode	Mode of IPSec Phase 1 negotiation.

Table 4-4: Relevant field in IPSEC -> IKE (PHASE 1) DEFAULTS -> EDIT

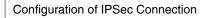
Proceed as follows to define the necessary settings:

- Set *Mode* to *id_protect*.
- Configure the other parameters according to your requirements.
- Press SAVE to confirm your settings.

Note	

As the IP addresses are exchanged by the ISDN callback mechanism, *id_protect* can be entered here as mode. This achieves higher security in the authentication of the IPSec connection.

Return to the main menu and finally save your new configuration in the flash memory with *EXIT* and *SAVE AS BOOT CONFIGURATION AND EXIT*.



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5 Result

5.1 Test of Connection and ISDN Callback

The connection is set up by the head office with a ping. You can follow the setup of the connection and the ISDN callback by entering the command debug all in the command line.

00:02:28 INFO/INET: dialup if 100001 prot 1 192.168.1.2:2048->192.168.0.2:3420 00:02:28 INFO/INET: dialup if 10001 prot 17 0.0.0.0:500->0.0.0.0:500 00:02:28 DEBUG/PPP: Internet: dial number <00101901929> 00:02:31 DEBUG/PPP: Layer 1 protocol hdlc, 64000 bit/sec 00:02:31 DEBUG/PPP: Internet: set ifSpeed, number of active connections: 0/0/0 00:02:31 DEBUG/PPP: Internet: set ifSpeed, number of active connections: 1/1/1 00:02:31 DEBUG/PPP: Internet: outgoing connection established 00:02:31 INFO/PPP: Internet: local IP address is 213.7.46.137, remote is 62.104.219.41 00:02:31 DEBUG/INET: NAT: new outgoing session on ifc 10001 prot 17 192.168.1.1:4500/213.7.46.137:32769 -> 213.7.0.117:32769 00:02:31 INFO/IPSEC: IPSEC CB - need callback from Peer "branch office" 00:02:31 INFO/IPSEC: IPSEC CB - trigger callback at Peer "branch office" (do call "*"->"101") 00:02:31 INFO/IPSEC: IPSEC CB - Peer "branch office", trigger call "*" -> "101" is ALERTING 00:02:41 INFO/IPSEC: IPSEC CB - Trigger Call by Peer "branch office" successfully transmitted IP 213.7.46.137 / Token 4203 via B channel 00:02:41 DEBUG/INET: NAT: new incoming session on ifc 10001 prot 17 213.7.46.137:4500/213.7.46.137:4500 <- 213.7.0.117:32770 00:02:41 DEBUG/IPSEC: P1: peer 0 () sa 2 (R): new ip 213.7.46.137 <- ip 213.7.0.117 00:02:41 INFO/IPSEC: P1: peer 0 () sa 2 (R): Vendor ID: 213.7.0.117:32770 (No Id) is 'BINTEC' 00:02:41 INFO/IPSEC: P1: peer 0 () sa 2 (R): Vendor ID: 213.7.0.117:32770 (No Id) is 'BINTEC Heartbeats Version 1' 00:02:41 INFO/IPSEC: P1: peer 0 () sa 2 (R): Vendor ID: 213.7.0.117:32770 (No Id) is 'RFC XXXX' 00:02:41 INFO/IPSEC: P1: peer 0 () sa 2 (R): Vendor ID: 213.7.0.117:32770 (No Id) is 'draft-ietfipsec-nat-t-ike-03' 00:02:41 INFO/IPSEC: P1: peer 0 () sa 2 (R): Vendor ID: 213.7.0.117:32770 (No Id) is 'draft-ietfipsec-nat-t-ike-02' 00:02:41 INFO/IPSEC: P1: peer 0 () sa 2 (R): Vendor ID: 213.7.0.117:32770 (No Id) is 'draft-ietfipsec-nat-t-ike-02' 00:02:41 INFO/IPSEC: P1: peer 0 () sa 2 (R): Vendor ID: 213.7.0.117:32770 (No Id) is 'draft-ietfipsec-nat-t-ike-00' 00:02:41 DEBUG/IPSEC: P1: peer 0 () sa 2 (R): token payload: received token 4203 00:02:41 DEBUG/IPSEC: P1: peer 1 (branch office) sa 2 (R): identified ip 213.7.46.137 <- ip 213.7.0.117 00:02:41 INFO/ACCT: ISDN: 01.01.1970,00:02:31,00:02:41,0,50,66,6,6,,0,100,101,7/0,90,0,ipsec callback 00:02:41 DEBUG/ISDN: stack 0: disconnect cause: normal call clearing (0x90) 00:02:42 INFO/IPSEC: New Bundle -2 (Peer 1 Traffic -1) 00:02:42 INFO/IPSEC: P1: peer 1 (branch office) sa 2 (R): done id fqdn(any:0,[0..7]=head office) <- id fqdn(any:0,[0..6]=branch office) IP[b08aff69 52147e68 : 2e024f96 ed2eae37]</pre> 00:02:42 INFO/IPSEC: P2: peer 1 (branch office) traf 0 bundle -2 (I): created 192.168.1.0/192.168.1.0:0 < any > 192.168.0.0/192.168.0.0:0 rekeyed 0 00:02:42 DEBUG/IPSEC: P2: peer 1 (branch office) traf 0 bundle -2 (I): SA 3 established ESP[75fc1b68] in[0] Mode tunnel enc blowfish-cbc(16) auth md5(16) 00:02:42 DEBUG/IPSEC: P2: peer 1 (branch office) traf 0 bundle -2 (I): SA 4 established ESP[4fcbcfdd] out[0] Mode tunnel enc blowfish-cbc(16) auth md5(16) 00:02:42 INFO/IPSEC: Activate Bundle -2 (Peer 1 Traffic -1) 00:02:42 INFO/IPSEC: P2: peer 1 (branch office) traf 0 bundle -2 (I): established (213.7.46.137<->213.7.0.117) with 2 SAs life 28800 Sec/0 Kb rekey 23040 Sec/0 Kb Hb none

Here the IP address has been successfully transferred in the B-channel and the IPSec tunnel has been set up.

Field	Menu	Description	Compulso ry field
Item	ISDN S0 → Incoming Call Answering → ADD	IPSec	Yes
Number	ISDN S0 → Incoming Call Answering → ADD	e.g. <i>100</i>	Yes
Mode	ISDN S0 → Incoming Call Answering → ADD	right to left	Yes
Bearer	ISDN S0 → Incoming Call Answering → ADD	any	Yes
Description	IPSEC → Configure Peers → APPEND	e.g. branch office	Yes
Peer IDs	IPSEC → Configure Peers → APPEND	e.g. branch office	Yes
Pre Shared Key	IPSEC → Configure Peers → APPEND	e.g. <i>Test</i>	Yes
Virtual Interface	IPSEC → Configure Peers → APPEND	e.g. yes	Yes
IP Transit Network	IPSEC → Configure Peers → Relevant Peer → Interface IP Settings → Basic IP Settings	no	Yes
Local IP Address	IPSEC → Configure Peers → Relevant Peer → Interface IP Settings → Basic IP Settings	e.g. 192.168.1.1	Yes
Default Route	IPSEC → Configure Peers → Relevant Peer → Interface IP Settings → Basic IP Settings	no	Yes
Remote IP Address	IPSEC → Configure Peers → Relevant Peer → Interface IP Settings → Basic IP Settings	e.g. 192.168.0.0	Yes
Remote Netmask	IPSEC → Configure Peers → Relevant Peer → Interface IP Settings → Basic IP Settings	e.g. 255.255.255.0	Yes

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Field	Menu	Description	Compulso ry field
ISDN Callback	$IPSEC \rightarrow Configure Peers \rightarrow IPSec$ $Callback$	both	Yes
Incoming ISDN Number	$\begin{array}{l} IPSEC \rightarrow Configure \ Peers \rightarrow IPSec \\ Callback \end{array}$	e.g. <i>101</i>	Yes
Outgoing ISDN Number	$\begin{array}{l} IPSEC \rightarrow Configure \ Peers \rightarrow IPSec \\ Callback \end{array}$	e.g. 101	Yes
Transfer own IP Address over ISDN	$\begin{array}{l} IPSEC \rightarrow Configure \ Peers \rightarrow IPSec \\ Callback \end{array}$	yes	Yes
Mode	$\begin{array}{l} IPSEC \rightarrow Configure \ Peers \rightarrow IPSec \\ Callback \end{array}$	autodetect best possible mode (D or B channel)	Yes
Authentication Method	$\begin{array}{l} \text{IPSEC} \rightarrow \text{IKE (Phase 1) Defaults} \rightarrow \\ \text{edit} \rightarrow \text{Autogenerated} \end{array}$	ip_protect	Yes