Telkom

Telkom SA Limited

User Manual for Telkom Internet Static IP addresses for DSL

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Contact Detail:	Telkom SA SOC Limited				
Postal Address:					
City/Town Postal Code, Country					
Tel:	10210 / 10217				
Fax:	N/A				
	www.telkomsa.net				

Document Information

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1. INTRODUCTION

The Static IP address feature for Telkom Internet DSL allows customers using ADSL or VDSL as access technology to have a fixed IP address, even though the Telkom ADSL network currently doesn't offer this feature natively.

In order to use this feature, the customer must be eligible for the static IP address feature, and have device that supports L2TP-based VPNs in a suitable position in their network for terminating the L2TP tunnel and ensuring security of devices that access the internet via the L2TP tunnel.

This document is intended to provide the general settings that a Telkom Internet customer should use in order to be able to effectively use the feature, as well as provide some screenshots/configurations for devices that have been tested.

2. KEYWORDS, ABBREVIATIONS AND ACRONYMS

Abbreviation	Description
DSL	Digital Subscriber Line
IP	Internet Protocol
L2TP	Layer 2 Tunnelling Protocol
LAC	L2TP Access Concentrator
LNS	L2TP Network Server
VPN	Virtual Private Network

The abbreviations and acronyms used in the document are listed in the table below.

3. HOW TO USE THIS MANUAL

This user manual is intended to assist the customer, who is entitled to use the static IP feature and has activated static IPs, in configuring the Telkom-supported modem (LAC) that supports the feature, as well as providing sufficient information to allow customers with other compatible platforms to configure their client (LAC).

You must activate the Static IP service using the <u>Telkom Internet Service Management Tool</u> before you will be able to use the feature effectively.

Please read all of section 4, before skipping to a configuration example in section 5. The examples use an example username onlineXXXXX@telkomsa.net, and example password 'yourpassword'. Replace these with your Telkom Internet ADSL username and password.

After configuration of the static IP feature, please verify that any network security settings (e.g. firewall rules) that you had applied before are still applied on the new interface which will handle your internet traffic.

4. CONFIGURATION PARAMETERS

An L2TP Access Controller needs to be configured correctly be able to establish an L2TP tunnel with an L2TP Network Server (LNS).

The Telkom Internet Static IP address feature supports two different configurations, with tunnel authentication, and without tunnel authentication. Some devices may support one, or the other, or both. Devices that support both tunnel authentication and no tunnel authentication should use the setting without tunnel authentication (as there is no significant security benefit to using tunnel authentication in this scenario but slightly higher overhead).

4.1 Configuration parameters without tunnel authentication

Devices that do not support tunnel authentication **MUST** be configured with the settings below (if present), and the settings below are recommended for devices that support both modes:

Parameter	Value
Server IP address or name	staticip.telkomsa.net
Tunnel authentication	No
Tunnel secret	N/A
Authentication type	PAP
Username	<telkom e.g.="" internet="" online123456@telkomsa.net="" username=""></telkom>
Password	<password above,="" e.g.="" for="" test@123="" used="" username=""></password>

4.2 Configuration parameters with tunnel authentication

The following settings are recommended only for devices that do not support tunnels without tunnel authentication

Parameter	Value
Server IP address or name	staticip-auth.telkomsa.net
Tunnel authentication	Yes
Tunnel secret	I2tp
Authentication type	PAP
Username	<telkom e.g.="" internet="" online123456@telkomsa.net="" username=""></telkom>
Password	<password above,="" e.g.="" for="" test@123="" used="" username=""></password>

5. CONFIGURATION OF SUPPORTED TELKOM-SUPPLIED MODEMS

At present, the only modem (LAC) supplied by Telkom that supports the DSL Static IP feature is the Zyxel SBG3300.

5.1 Zyxel SBG3300

The settings for L2TP tunnels are accessible under the VPN->L2TP VPN menu

The Zyxel SBG300 supports both tunnel authentication and no tunnel authentication, and both options are displayed for reference.



Without tunnel authentication 5.1.1

Configured as in 4.1, the Zyxel SBG3300s L2TP VPN configuration screen should look as shown. Values that were changed from their defaults in this screen are:

- -Type: Client
- Server IP Address or Name: staticip.telkomsa.net
- Auth Type: check 'PAP' -
- Username: enter your Telkom Internet ADSL username
- Password: enter the password for your Telkom Internet ADSL username
- Under 'Interface Group NAT Setup', select NAT.

5.1.2	With	tunnel	authentication
-------	------	--------	----------------

Configured as in 4.2, the Zyxel SBG3300s L2TP VPN configuration screen should look as shown. Additional values that were changed from the defaults in this screen are:

- Tunnel Auth: check the checkbox
- Tunnel secret: l2tp



5.1.3 Verification

Once the L2TP connection has been configured successfully, the 'Monitor' tab should the L2TP connection, the 'Client L2TP IP' should match the IP address you were assigned when you activated the static IP feature.

	Monitor						
Tho to	blo bolow disp	ave the L2TP client o	onnection stat	is and etc	atictics		
ine ta	the below disp	ays the L21P client	onnection stati	13 and 36	anches.		
L2TP	Status						Updated in 15 secon
S 1	Up Time	Server Name	Server WAN	P	Client WAN IP	Server L2TP IP	Client L2TP IP
9	00:01:15	staticip.telkoms	105.225.0.10	1	105.228.237.22	105.225.0.111	105.187.220.1
.ast dis	sconnection: L2TI	VPN in Server Mode [0	1/01/15 00:01:19	9]			
L2TP	Statistics						
	ata Packets	Rx Data Bytes	F	x Errors	Tx Data Packets	Tx Data Bytes	Tx Errors
Rx Da							

....

✓ PAP ✓ CHAP

192.168.2.1/255.255.255.0

.....

online @telkomsa.net

(4-64 characters, excluding "//=")

None • NAT Address Mapping Apply

Cancel

Tunnel Secret :

PPP Setup

MPPE Enable

Auth Type :

Username : Password :

Default

Interface Group NAT Setup

6. CONFIGURATION OF UNSUPPORTED CLIENTS

The following section provides example configurations for clients besides the supported modem/client. While the configuration was tested successfully, no support can be provided for these clients. In a number of the following examples, the LAC may not be an ADSL modem, please ensure that the LAC has internet access before configuring the L2TP connection.

6.1 Windows

Windows Vista or later and Windows Server 2008 or later support L2TP VPNs, but default to requiring encryption and not allowing PAP authentication.



Currently connected to: 49
Network
Internet access
Open Network and Sharing Center

- Create a new network connection (for example click the network icon in the system tray and click on 'Open Network and Sharing Center', then click on 'Set up a new connection or network')
- 2. The 'Set Up a Connection or Network' dialog will prompt you for the type of connection, choose 'Connect to a Workplace'.
- 3. In the 'How do you want to connect?' dialog, choose 'Use my Internet connection (VPN)'.



sare	Set Set acci	up a new connection or network and the second secon	on; or set up a router	or
Set Up a Connection	or Networ	k	_	
) 👰 Set Up a Conn	ection or l	Vetwork		
Choose a connect	tion option			
Connect Set up a	to the Inter wireless, br	net oadband, or dial-up connection to the Internet.		
Set up a	dial-up or \ dial-up cor	Inection		
Connect	to the Inte	rnet using a dial-up connection.		
			<u>N</u> ext Cano	el
Connect to a Workpla	ace			
🕽 🗽 Connect to a 1	Workplace			
How do you want	to connec ernet conn a virtual pri	t? ection (VPN) vate network (VPN) connection through the Internet.		
Dial directly Connect direct	, tly to a phor	e number without going through the Internet.		
What is a VPN con	mection?]		
			Cano	el
Connect to a Workpl	ace		-	
🖌 🗽 Connect to a 1	Workplace			
Type the Interne	t address (to connect to		
Your network adm	ninistrator o	an give you this address.	_	
Internet address:		staticip.telkomsa.net		
Destination name:		Telkom Internet Static IP		
Use a sma C Use a sma L Allow other This option Don't cons	rt card er people to n allows an nect now; j	o use this connection yone with access to this computer to use this connect ust set it up so I can connect later	ion.	

Change your networking settings

Next Next

- 5. The next dialog will prompt for a username and password, enter your Telkom Internet ADSL username and password.
- The next dialog will tell you that the connection is ready to use. Click the 'Close' button.

7. Edit the properties of the new virtual

8. In the properties dialog, select the 'Security' tab. In this tab, it is

'Properties').

adapter (click on the network icon in the system tray, right click on the newly created VPN connection, and choose

recommended to select the L2TP/IPSec option as the 'Type of VPN'. You must change 'Data encryption' to either 'Optional encryption' or 'No encryption allowed'. You must also check the 'Unencrypted password (PAP)' option

🕝 🔚 Connect to a Workpl	ace				
Type your user name ar	d password				
User name:	online	@telkomsa.net			
Password:	•••••				
	C Show	characters mber this password			
Domain (optional):					
		Create			
urrently connected to:	÷,	Telkom Internet Static IP Properties			
Network		General Options Security Networking Sharing			
	_	Layer 2 Tunneling Protocol with IPsec (L2TP/IPSec)			
al-up and VPN		Advanced settings			
kom Internet Static IP	ect.	Data encryption:			
Pro	erties				
	М	C Use Extensible Authentication Protocol (EAP)			
		Properties			
		Allow these protocols			
		Unencrypted password (PAP)			
		Challenge Handshake Authentication Protocol (CHAP)			
Open Network and Sharing Cer	iter	Microsoft CHAP Version 2 (MS-CHAP v2)			
* 🖻 🛍		Automatically use my Windows logon name and password (and domain, if any)			

- under 'Allow these protocols'.
 9. You should now be able to connect the L2TP connection by right-clicking on the virtual adapter and choosing 'Connect' (or from clicking on the network icon in the system tray, clicking on the virtual adapter, and clicking the 'Connect' button that appears).
- 10. If your ADSL connection is normally established by the same computer, you may want to select it in the 'Dial another connection first' drop-down on the 'General' tab and set this connection as the default connection.

6.2 Linux

There are a few different methods of creating L2TP VPNs under Linux. Which method might depend on which distribution you are using, and how you are using it (headless with CLI only, or GUI). We cover 2 different approaches that should work on most distributions, but there others as well.

6.2.1 Linux with L2TP plugin for Network Manager – GUI based

A plugin for configuring L2TP VPNs is available for Network Manager, which uses xl2tpd. Some Linux distributions may provide the package on the installation media or in the distribution's online package repository. Use your distribution's package manager (GUI or cli) to search for and install the plugin.

Distribution	CLI command to install the plugin
Fedora 20/21,RHEL6+ (with EPEL),Centos 6+	yum install NetworkManager-12tp
Arch	pacman -S networkmanager-12tp
Mageia 5+	urpmi networkmanager-12tp

In a few other distributions, 3rd-party packages are available. Follow the instructions at the relevant URL to install the packages.

Distribution	Third-party package URL
Ubuntu	https://launchpad.net/~seriy-pr/+archive/ubuntu/network-manager-l2tp
Debian	
Mint	
openSUSE 13.x	http://software.opensuse.org/package/NetworkManager-I2tp
SUSE SLE-12	

If packages are not available for your distribution, you can install from source (<u>https://github.com/seriyps/NetworkManager-I2tp/releases</u>), or use one of the other approaches.

Installing the plugin should pull in the xl2tpd package, which might be enabled as a service. Be sure to disable it after installation (e.g. 'systemctl disable xl2tpd'), as having it running as a service can interfere with usage from Network Manager.

After installing the plugin, you will need to reboot (or at least restart the system messagebus) for the bus policy provided with the plugin to be applied to the system bus before you will be able to connect the VPN as non-root.

To configure the L2TP connection, use the following steps:

- 1. Open the Network Manager connection editor (in GTK3-based desktops you can right-click the network icon in the system tray, otherwise run 'nm-connection-editor')
- 2. Click the add button, and choose L2TP

	?	Choose a Connection Select the type of connection If you are creating a VPN, a may not have the correct V	Type on you wish to create and the VPN connecti PN plugin installed.	e. ion you wish to create does not appear in the list, you
		Layer 2 Tunneling Proto	ocol (L2TP)	•
		Compatible with L2TP VPN s	ervers.	
				Cancel Create
In the dialog for the connection, onter				Editing staticip ×
'staticin telkomsa net' for the 'Gateway' a	nd er	nter vour	Connection name:	staticip
Telkom Internet ADSI username and pas	swor	d in the	General VPN IP	V4 Settings
relevant text fields, and click 'Save'.	onon		General	
			Gateway: s	taticip.telkomsa.net
			Optional	
			User name:	youruser@telkomsa.net
			Password:	yourpassword Saved
				Show password
			NT Domain:	
				IPsec Settings
			Export	Cancel Save
You should now be able to enable the VP from the network icon in the system trav	N cor	nnection		Wired
If you want the connection to start at boot	VOU	may need to	o run	
some cli commands so that the configurat	tion d	oesn't requir	re a	VPN Connections I
password agent:				· · · · · · · · · · · · · · · · · · ·
nmcli c mod staticip vpn.data password nmcli c mod staticip +vpn.secrets pass	d-fla sword	gs=0 =yourpasswo	rd	Network Settings Network Connections
				● <i>∠</i> 🔊 😚 14:49 E

3.

4.

5.

You may want to modify the internet connection for the machine (e.g. an Ethernet or PPPoE) to start the VPN connection when the internet connection becomes available.

Alternatively, you can also configure the VPN connection using the CLI:

```
# nmcli connection add type vpn ifname staticip autoconnect true vpn-type l2tp user
onlineXXXXX@telkomsa.net
Connection 'vpn-staticip' (98044f4f-329e-4da8-8d50-5f34490bfc05) successfully added
# nmcli con modify vpn-staticip +vpn.data gateway=staticip.telkomsa.net \
+vpn.secrets password=yourpassword
```

The VPN connections created via either method can also be started and stopped using nmcli, e.g. 'nmcli c u staticip' (or 'nmcli c u vpn-staticip') to start the connection or 'nmcli c d staticip' (or 'nmcli c d vpn-staticip') to stop it.

6.2.2 Linux with OpenL2TP (CLI)

The following configuration commands should be saved in /etc/openl2tpd.conf:

```
ppp profile modify profile_name=default auth_pap=yes default_route=yes
tunnel create tunnel_name=tistatic dest_ipaddr=staticip.telkomsa.net persist=yes \
auth_mode=none
session create tunnel_name=tistatic session_name=tistatic \
user_name=onlineXXXXXX@telkomsa.net user_password=yourpassword
```

OpenL2TP may not necessarily add a route to the LNS, you may find that you need to add a specific route to the LNS to ensure it doesn't try and route the L2TP traffic over the tunnel. For example, you may need to run the following command before starting OpenL2TP:

ip route add 105.225.0.101 via 10.0.0.2 or ip route add 105.225.0.101 dev ppp0

You may rather want to ensure that the route is added with the internet interface comes up. The method will differ by distribution, but on Red-Hat-style systems you can do it by adding a line as follows to e.g. /etc/sysconfig/network-scripts/route-eth0 or /etc/sysconfig/network-scripts/route-ppp0:

```
105.225.0.101 dev eth0
or
105.225.0.101 dev ppp0
```

Starting openl2tpd (e.g. 'systemctl start openl2tp' or 'sudo service openl2tpd start') should result in the tunnel coming up.

6.3 MikroTik

This example covers setting up both the ADSL connection and the static IP connection.

6.3.1 Setting up the ADSL connection on MicroTik

You need to have your MicroTik connected to the LAN port on your ADSL modem, which must be in Bridge, Half-Bridge or PPPoE-relay mode.

1. Open Interface window, click the plus and select PPPoE client

C# Safe M	de				Memory: 37.8 N	iB Uptime: 4d 00	48:21 CPU 2%	Hide Password	ds
here a children and the									
Interfaces	h	reface List							_
Wireless		terface Disemet Fall Tunnel II	Turned GRE Turned MIAN M	PPP Rending 17	TE				
Bridge			Turiner and Turiner VENIN V	HAP bonding Li	16				
PPP									
(m) Cuitch		Name	Туре	L2 MTU Tx	Rx		Tx Packet (p/s)	Rx Packet (p/s)	
Se Switch	S	ether1	Ethernet	1526	0 bps	0 bps		0	0
Mesh	H	<pre>4i>ether2</pre>	Ethemet	1522	0 bps	0 bps		0	
👳 IP	- F 📙	S WIFI	Wireless (Athems AR9	2290	45.9 kbps	4.5 kbps		6	-
IPv6	D B	4=2br0	Bridge	1522	45.9 kbps	3.7 kbps		6	-
Ø MPLS	r X	UNUSED	Wireless (Atheros AR5	2290	0 bps	0 bps		0	(
X Routing	1								
System	P.								
Queues									
Queues									
Queues Files									
Queues Files Log Radius									
Queues Files Log Radius Yools	1								
Queues Files Log Radius Tools New Termina	⊳ ∎	žems (1 selected)							
Queues Files Log Radius Yools New Termini MetaROUTE	⊳ el iR	items (1 selected)						_	
Queues Gueues Files Log Adus Tools New Termini MetaROUTE Partition	► el ER	tems (1 selected)		_					
Queues General Constraints General Constraints Andream Constraints Andream Constraints Andream Constraints Andream Constraints Andream Constraints Make Support	⊢ al 6 R t.nf	tems (1 selected)							

2. Change the MTU & MRU to 1492 and select the Interface on which PPPoE must be established

New Interfac	e			
General D	ial Out Status Tra	ffic		ОК
Name:	Telkom Internet - PP	PoE		Cancel
Type:	PPPoE Client			Apply
L2 MTU:				Disable
Max MTU:	1492			Comment
Max MRU:	1492			Сору
MRRU:	1600		▲	Remove
Interfaces:	ether2		∓ ≑	Truch
				I orch
				PPPoE Scan
enabled	running	slave	Status	s:

3. On the Dial Out tab, enter the username, password, select Use Peer DNS and select add Default Router with Default Route Distance of 100 (floating default route). Click OK

Interface <telkom interne<="" th=""><th>t - PPPoE></th><th></th></telkom>	t - PPPoE>	
General Dial Out Stat	us Traffic	ОК
Service:		 Cancel
AC Name:		 Apply
User:	online @telkomsa.net	Disable
Password:		Comment
Profile:	default	Сору
Keepalive Timeout:	60	 Remove
	Dial On Demand	Torch
	Use Peer DNS	PPPoE Scan
Default Route Distance:	Add Default Route	
- Allow		
✓ pap	✓ chap	
✓ mschap1	✓ mschap2	
enabled runnir	ng slave	Status: connected

6.3.2 Setting up the L2TP connection on MikroTik

 Open the IP -> Routes window and click the plus

D									
Route Lis	t I								
Routes	Nexthops	Rules	VRF						
+ -		4	7				Find	all	Ŧ
[Ost. Address		A	Gateway	Distance	I	Routing Mark	Pref	Sourc 🔻
DAC	10.0.0/2	24		ether2 reachable		0		10.0	.0.1
DAC	105.184.4	43.1		Telkom Internet - PPPoE reachable		0		105	184.234.4
DAC	192.168.2	20.0/24		br0 reachable		0		192	168.20.1
•									+
3 items									

2. Add a route to 105.225.0.101 with the gateway of the newly created PPPoE interface

General Attrib	utes		OK
Dst. Addres	s: 105.225.0.101		Cancel
Gatewa	y: Telkom Internet - PPPoE	\$	Apply
Check Gatewa	y:	•	Disable
Тур	e: unicast	₹	Commer
Distanc	a:	•	Сору
Scop	: 30		Remov
Target Scop	: 10		
Routing Mar	c	▼	
Pref. Sourc	e:	•	
enabled	active		

1. Open Interface window, click the plus and select L2TP client. On the 'General' tab, set the Max MTU and Max MRU to 1452.

New Interface	e	
General Di	al Out Status Traffic	ОК
Name:	Telkom Internet - L2TP	Cancel
Type:	L2TP Client	Apply
L2 MTU:		Disable
Max MTU:	1452	Comment
Max MRU:	1452	Copy
MRRU:	1600	Bemove
		Torch
enabled	running slave Stat	tus:

2. Under the Dial Out tab, enter "staticip.telkomsa.net" into the Connect To field, populate the username & password, change the profile to default and select Add Default Route



- 3. Both the PPPoE and L2TP sessions should now be established
- 4. For basic NAT, head to the IP->Firewall window and select plus. Change "Out. Interface" to the newly create L2TP client. On the Action tab, select Action masquerade.

6.4 Cisco

This configuration presumes a Cisco router with an ADSL interface.

Create a dialler interface for the ADSL connection

```
interface Dialer1
mtu 1492
ip address negotiated
ip virtual-reassembly in
encapsulation ppp
dialer pool 1
dialer-group 1
ppp pap sent-username onlineXXXXX@telkomsa.net password 0 yourpassword
no cdp enable
```

Create a pseudowire class :

```
pseudowire-class L2TP
encapsulation l2tpv2
ip local interface Dialer1
```

Create a virtual PPP interface using the pseudowire:

```
interface Virtual-PPP2
ip address negotiated
ppp pap sent-username onlineXXXXX@telkomsa.net password 0 yourpassword
no cdp enable
pseudowire 105.225.0.101 1 pw-class L2TP
```