# ACKSYS OpenVPN 설정 매뉴얼

# [적용모델]









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ACKSYS 제품을 통해 cellular VPN client가 사무실 백본에 있는 VPN 서버에 연결되는 예시입니다.

사내 네트워크망에서는 VPN 클라이언트의 트래픽이 VPN 서버에 전달될 수 있도록 라우터에 포트포워딩 규칙(여 기서는 1194 포트)을 설정해주세요. 인증서와 키없이 터널을 구축하여 간단하게 테스트를 하고, 그 이후 인증과 암 호화를 추가하여 테스트 합니다.

가입한 LTE 상품에 따라 고정공인 IP 또는 사설유동 IP를 부여받을 수 있으며, 이에 따라 AirBox14(LTE) 제품은 서버 또는 클라이언트로 동작되어 거리에 제한 없이 LTE망을 통해 적절한 네트워크망을 구축하실 수 있습니다.

윈도우 PC에서는 기본적으로 방화벽에 의해 ping 응답이 비활성화 되어 있으므로 들어오는 ping 트래픽을 허용하 는 규칙을 추가하세요. PC1과 PC2는 아래처럼 설정하실 수 있으며, 이 매뉴얼에서의 모든 IP는 네트워크 환경에 따라 적절하게 변경하실 수 있습니다.

구분		PC1		PC2	
IP		192.168.33.14	192.168.23.14		
Subnet Mask		255.255.255.0	255.255.255.0		
Gateway		192.168.33.1		192.168.23.1	
DNC	기본	168.126.63.1	기본	211.36.129.4	
DINS	보조 168.126.63.2		보조	117.111.29.4	



# SETUP > NETWORK

	SETUP	TOOLS	STATUS				
PHYSICAL INTERFACES	NETWORK	OVERVIEW					
VIRTUAL INTERFACES		OVERVIEW					
NETWORK	NAME	ENABLED	IP ADDRESS	NETMASK	GATEWAY (METRIC)	PERSISTENCE	ACTIONS
LAN	LAN		192.168.33.1	255.255.255.0		Enabled	2 🗙
WAN	WAN	I.	192.168.1.249	255.255.255.0	192.168.1.1 (0)	Default	<b>Z</b> ×
VPN BRIDGING ROUTING / FIREWALL	Add	network					

(설정이 완료된 화면)

#### NETWORK - LAN

On this page you can configure the network interfaces. You can bridge several interface network interfaces.

COMMON CONFIGURATION	
General Setup Interfaces Settings Advanced Settings	
Enable interface	
Network description	LAN
	Friendly name for your net
Protocol	static
IPv4-Address	192.168.33.1
IPv4-Netmask	255.255.255.0
Default IPv4 gateway	
Default gateway metric	0
	Gateway priority when sev
	(Used only when a default gate
DNS server(s)	
	You can specify multiple D

#### **NETWORK - LAN**

On this page you can configure the network interfaces. You can bridge several interface network interfaces.

COMMON CONFIGURATION	
General Setup Interfaces Settings Advanced Settings Bridge interfaces	🕑 👩 creates a bridge ov
Enable <u>STP/RSTP</u>	O Enables the Spanni     WARNING: Some cautions
Enable LLDP forwarding	Image:
bridge VLAN	<ul> <li>Enable VLAN mana</li> <li>bridging)</li> </ul>
Interface	WiFiadag Ø JEthernet
мти	1500

#### NETWORK - LAN

On this page you can configure the network interfaces. You can bridge several network interfaces.

(	COMMON CONFIGURATION						
	General Setup Interfaces Settings Advanced Settings						
	Network persistence	Enabled Avoid the network					
	State at startup	Default Default is 'up' ex Use 'down' if this net					

Network의 LAN IP를 static으로 설정합니다. gateway는 생략되어도 됩니다.

Bridge interfaces 및 Interface 설정(LAN1)을 체크합니다.

기본 설정을 유지합니다.



# SETUP > NETWORK

	SETUP	TOOLS	STATUS				
PHYSICAL INTERFACES	NETWORK	OVERVIEW					
VIRTUAL INTERFACES		<b>OTERCIEN</b>					
NETWORK	NAME	ENABLED	IP ADDRESS	NETMASK	GATEWAY (METRIC)	PERSISTENCE	ACTIONS
LAN	LAN	4	192.168.33.1	255.255.255.0		Enabled	<b>Z</b> ×
WAN	WAN	A.	192.168.1.249	255.255.255.0	192.168.1.1 (0)	Default	<b>Z</b> ×
VPN BRIDGING ROUTING / FIREWALL	Add	network					

(설정이 완료된 화면)

#### **NETWORK - WAN**

On this page you can configure the network interfaces. You can bridge several inter network interfaces.

COMMON CONFIGURATION	
General Setup Interfaces Settings Advanced Setting Enable interface	gs Ø
Network description	WAN
	Friendly name for yo
Protocol	static
IPv4-Address	192.168.1.249
IPv4-Netmask	255.255.255.0
Default IPv4 gateway	192.168.1.1
Default gateway metric	0
	Gateway priority whe
	(Used only when a defau
DNS server(s)	
	A v

#### NETWORK - WAN

On this page you can configure the network interfaces. You can bridge several interl network interfaces.

#### COMMON CONFIGURATION

General Setup Interfaces Settings Advanced S	Settings
Bridge interfaces	🔲 👔 creates a bridge (
Interface	◯ 🤵 WiFi ac ◯ 🚂 Etheme ● 💽 Etheme
мти	1500

#### **NETWORK - WAN**

On this page you can configure the network interfaces. You can bridge seve network interfaces

(	COMMON CONFIGURATION						
	General Setup	Interfaces Settings Advanced Setting	s				
	Network persistenc	e	Default Avoid the n				
	State at startup		Default Default is 'u Use 'down' if thi				

Add network를 클릭하여 Network의 WAN IP를 static으로 설정합니다. 해당 네트워크의 gateway를 기입합니다.

Bridge interfaces 체크 해제 및 Interface 설정(LAN2)을 체크합니다.

두 항목을 Default로 설정합니다.



# SETUP > VPN

	SETUP	TOOLS STATUS					
PHYSICAL INTERFACES		STANCES OVERVIEW					
VIRTUAL INTERFACES							
NETWORK	NAME	ENABLED	MODE	PROTOCOL	SECURITY	ACTIONS	
VPN	vpn1	<b>v</b>	Server	tcp/1194	none		
VPN1	Add instance						
BRIDGING							

## (설정이 완료된 화면)

## SETUP TOOLS STATUS

### **OPENVPN - VPN1**

OpenVPN can work in server mode, waiting for a number of clients to call in, or in client mode, where it connects to a pre-

CONFIGURATION	
Tunnel settings         Auth/Crypto         Server settings           Enable virtual network         Server settings         Server settings	Ø
State at startup	Up  Default is 'up' except for networks with protocol 'none'. Use 'down' if this network should be brought up only by event rules.
OpenVPN instance description	vpn1 Priendly name for this VPN instance
Role	Server (called)
Protocol	TCP Pavor UDP, as TCP leads to potential conflicts in the TCP over TCP rec
Listener port	1194 Ø UDP or TCP port that the server will listen to, and that the client will call
Data channel compression	Use fast LZO compression
Tunnel type	L3 (IP) tunnel
VPN subnet local IP address	10.8.0.1  IP address of the local VPN endpoint, not used in TLS client mode since
VPN subnet mask	255.255.255.0 ② Subnet mask of the VPN subnet, not used in TLS client mode
Keepalive period	10
Keepalive timeout	30 <ul> <li>Keepalive timeout (seconds). Connection terminates if no traffic is receiption</li> </ul>

## 서버 설정 및 TCP, 통신포트 1194를 설정합니다.

#### LOCAL ROUTES

This section is used in both Server and Client modes. It lists the routes to be installed in the local IP stack.

- · In the client, it lists the server subnets reachable using the server as gateway,
- In the server, it lists the client subnets reachable using the client as gateway.

If the gateway is not indicated, it defaults to the VPN remote address.

TARGET NET	NETMASK	GATEWAY	1
192.168.23.0	255.255.255.0	10.8.0.2	Default: 0

클라이언트 네트워크 대역 및 게이트웨이를 설정합니다.



# SETUP > VPN

	SETUP T	OOLS STATUS								
PHYSICAL INTERFACES	OPENVPN INST	TANCES OVERVIEW								
VIRTUAL INTERFACES										
NETWORK	NAME	ENABLED	MODE	PROTOCOL	SECURITY	ACTIONS				
VPN	vpn1	<b>v</b>	Server	tcp/1194	none	2 🗶				
VPN1										
BRIDGING	Add Instan	Add instance								
DOUTING / EIDEWALL										

(설정이 완료된 화면)

### **OPENVPN - VPN1**

OpenVPN can work in server mode, waiting for a number of clients to call in, or in client mode, where it connects to a pr

CONFIGURATION				
Tunnel settings Auth/Crypto	Server settings	(		기타의 테포트를 이번 이중 나이 가 어어
Data channel authentication digest	No ke SHA1 @ Data	y (entails P2P, cleartext, no auth) (OpenVPN default) channel authentication algorithm. Adds overhe	▼ ▼ ead to frames size	간단안 테스트들 위해 인증서와 키 없이 설정을 진행합니다.
LOCAL ROUTES				
This section is used in both Server and	d Client modes. It lists the routes to be	installed in the local IP stack.		
<ul> <li>In the client, it lists the server s</li> <li>In the server, it lists the client s</li> </ul>	subnets reachable using the server as ubnets reachable using the client as g	gateway, iateway.		
If the gateway is not indicated,	it defaults to the VPN remote address	ι.		
TARGET NET	NETMASK	GATEWAY		
102 168 23 0	255 255 255 0	10.9.0.2	Defeulte 0	



# SETUP > ROUTING/FIREWALL > NETWORK ZONES

	SETUP	TOOLS STATUS				
PHYSICAL INTERFACES	NETWORK	ZONES OVERVIEW				
VIRTUAL INTERFACES						
NETWORK	NAME	COVERED NETWORKS	FORWARD TO DESTINATION ZONE	NAT ENABLE	LOCAL SERVICES	ACTIONS
VPN	LAN_zone	"LAN"	VPN_zone WAN_zone		All enabled	2 💌
BRIDGING	VPN_zone	vpn1	LAN_zone WAN_zone		All enabled	2 💌
ROUTING / FIREWALL	WAN_zone	"WAN"			All enabled	2 🗙
DOS PROTECTION MULTICAST ROUTING NETWORK ZONES	Add	zone				

(설정이 완료된 화면)

### **NETWORK ZONES - ZONE SETTINGS**

Use this section only if NAT is disabled on this zone.

Covered networks specifies which available netwo	orks are members of this zone.
General Settings Advanced Settings	
Name	LAN_zone
Enable NAT	🗌 😰 Only on public zones. Wa
MSS clamping	
Default acceptance policy for local services	All enabled
	You can restrict or open the loc
Covered networks	🖉 LAN: 🚛
	WAN: 🔎
	vpn1: ++

위의 Add zone을 클릭하여 LAN\_zone을 설정합니다.

커버하는 네트워크는 해당 영역을 선택합니다.

## 이 부분은 각 네트워크 영역을 생성한 후에 나타납니다.

LAN\_zone을 먼저 생성하고 각 영역을 생성한 후에 체크합니다.

위의 Add zone을 클릭하여 VPN\_zone을 설정합니다.

커버하는 네트워크는 해당 영역을 선택합니다.

이 부분은 각 네트워크 영역을 생성한 후에 나타납니다.

VPN\_zone을 생성하고 각 영역을 생성한 후에 체크합니다.

Allow forwarding to destination zones.	VPN_zone vpn1:			
	WAN_zone WAN: 🖉			
TWORK ZONES - ZONE SETTINGS				
DNE "VPN_ZONE"				
This section defines common properties of "VPN_zone".				
Covered networks specifies which available networks are r	nembers of this zone.			
General Settings Advanced Settings				
Name	VPN_zone			
Enable NAT	🔲 😰 Only on public zones. Warn			
MSS clamping				
Default acceptance policy for local services	All enabled			
	You can restrict or open the local			
Covered networks	LAN: 🔎			
	WAN: 🔎			
	Von1: ++			

All WAN\_zone WAN: 🧾



# SETUP > ROUTING/FIREWALL > NETWORK ZONES

	SETUP	TOOLS STATUS				
PHYSICAL INTERFACES	NETWORK	ZONES OVERVIEW				
VIRTUAL INTERFACES						
NETWORK	NAME	COVERED NETWORKS	FORWARD TO DESTINATION ZONE	NAT ENABLE	LOCAL SERVICES	ACTIONS
VPN	LAN_zone	"LAN"	VPN_zone WAN_zone		All enabled	2 🕺
BRIDGING	VPN_zone	vpn1	LAN_zone WAN_zone		All enabled	2 💌
ROUTING / FIREWALL	WAN_zone	"WAN"			All enabled	2 💌
DOS PROTECTION MULTICAST ROUTING NETWORK ZONES	Add	zone				

(설정이 완료된 화면)

### **NETWORK ZONES - ZONE SETTINGS**

ONE "WAN_ZONE"	
This section defines common properties of "WAN_zon Covered networks specifies which available networks	e". are members of this zone.
General Settings Advanced Settings	
Name	WAN_zone
Enable NAT	🔲 🙆 Only on public zones. Wa
MSS clamping	
Default acceptance policy for local services	All enabled
	You can restrict or open the loc
Covered networks	🗆 LAN: 🗾
	VAN: 🔎
	umo fi tet

위의 Add zone을 클릭하여 WAN\_zone을 설정합니다.

커버하는 네트워크는 해당 영역을 선택합니다.

이 부분은 각 네트워크 영역을 생성한 후에 나타납니다.

기존에 생성한 영역의 체크를 해제합니다.

INTER-ZONE FORWARDING
Use this section only if NAT is disabled on this zone.
The options below control the forwarding policies between this zone (WAN\_zone) and other zone:
"WAN\_zone". The forwarding rule is *unidirectional*, e.g. a forward from lan to wan does *not* imply
Allow forwarding to *destination zones*:

LAN\_zone LAN:

# SETUP > NETWORK

	SETUP	TOOLS	STATUS				
PHYSICAL INTERFACES	NETWORK	OVERVIEW					
VIRTUAL INTERFACES		<b>OTERCIEN</b>					
NETWORK	NAME	ENABLED	IP ADDRESS	NETMASK	GATEWAY (METRIC)	PERSISTENCE	ACTIONS
LOCAL	LOCAL	<b>\$</b>	192.168.23.1	255.255.255.0	(0)	Enabled	2
CELLULAR	Cellular	set and the set of the	DHCP		DHCP (0)	Default	WAN config.
VPN							
BRIDGING	Add	network					
ROUTING / FIREWALL							

## 공인 IP는 보안상 블라인드 처리되었습니다.

(설정이 완료된 화면)

#### NETWORK - LOCAL

On this page you can configure the network interfaces. You can bridge several interfaces network interfaces.

COMMON CONFIGURATION	
General Setup Interfaces Settings Advanced Settings	]
Enable interface	<b>I</b>
Network description	LOCAL
	Priendly name for your netwo
Protocol	static
IPv4-Address	192.168.23.1
IPv4-Netmask	255.255.255.0
Default IPv4 gateway	
Default gateway metric	0
	Gateway priority when several (Used only when a default gateway)
DNS server(s)	211.36.129.4
	117.111.29.4
	You can specify multiple DNS

위의 Add network를 클릭하여 Network의 Local IP를 static으로 설정합니다.

gateway는 LTE에서 주어진 IP를 입력합니다. DNS는 사용하고 있는 통신사 DNS를 기입합니다.

#### **NETWORK - LOCAL**

On this page you can configure the network interfaces. You can bridge several interfaces by network interfaces.

COMMON CONFIGURATION	
General Setup Interfaces Settings Advanced Settings	
Bridge interfaces	🗹 😰 creates a bridge over spec
Enable <u>STP/RSTP</u>	Image: Constant of the second seco
Enable LLDP forwarding	Image:
bridge VLAN	<ul> <li>Enable VLAN managemen</li> <li>bridging)</li> </ul>
Interface	<ul> <li>✓ WiFi adapter: W</li> <li>✓ Ethernet adapte</li> <li>□ Ethernet adapte</li> </ul>
МТО	1500

Bridge interfaces 및 Interface 설정(LAN1)을 체크합니다. Interface WiFi 부분은 체크 해제하셔도 무방합니다. (추후 사용 시 체크 필요)

#### **NETWORK - LOCAL**

On this page you can configure the network interfaces. You can bridge severa network interfaces.

COMMON CONFIGURATION								
General Setup	Interfaces Settings	Advanced Settings						
Network persistend	ce		Enabled					
State at startup			Default					
			Oefault is 'up' e					

기본 설정을 유지합니다.



# SETUP > NETWORK

	SET	UP	TOOLS	STATUS				
PHYSICAL INTERFACES	NETW	<b>NBK</b>	OVERVIEW					
VIRTUAL INTERFACES			OVERVIEW					
NETWORK	NA	ME	ENABLED	IP ADDRESS	NETMASK	GATEWAY (METRIC)	PERSISTENCE	ACTIONS
LOCAL	LO	CAL	I.	192.168.23.1	255.255.255.0	(0)	Enabled	2
CELLULAR	Cel	ular	A.	DHCP		DHCP (0)	Default	WAN config.
VPN								
BRIDGING		Add	network					
ROUTING / FIREWALL	_							

## 공인 IP는 보안상 블라인드 처리되었습니다.

(설정이 완료된 화면)

## WAN SETTINGS - CELLULAR

On this page you c	an configure a WAN interface.	
CELLULAR		
General Setup SII Network description	M 1 SIM 2 Advanced Settings	Cellular
		😰 Friendly na
Default SIM card		<ul> <li>SIM 1</li> <li>SIM 2</li> </ul>
		[2] SIM slot se
Protocol		DHCP
Replace default route		🗹 😰 Repla
Default gateway metric		0

위의 Add network를 클릭하여 Network의 Cellular를 기본값으로 설정합니다.

#### WAN SETTINGS - CELLULAR

On this page you can configure a WAN interface.

CELLULAR	
General Setup SIM 1 SIM 2 Advanced Settings	
SIM card 1 PIN code	<i>»</i> ····
	Enter the correct SLOT 1 PIN code or you
SIM card 1 access point (APN)	m2m-static-server.lguplus.co.kr
	Required except for LTE-only connections
Authentication protocol	SIM only

### WAN SETTINGS - CELLULAR

On this page you can configure a WAN interface.

CELLULAR	
General Setup SIM 1 SIM 2 Advanced Settings	
Always disabled at startup	
State at startup	Default
	🕜 Default is 'u
	Use 'down' if th
Log AT transactions at "debug" level	🗌 😰 Use o

SIM 카드에 주어진 핀번호를 입력 후 APN을 기입합니다.

<LG U+ APN> m2m-static-server.lguplus.co.kr

<KTmMobile APN> Ite.ktfwing.com

그림과 같이 기본값으로 진행합니다.



# SETUP > VPN

		SETUP T	TOOLS	STATUS							
PHYSICAL INTERFACES	OPENVPN INSTANCES OVERVIEW										
VIRTUAL INTERFACES											
NETWORK	Ιſ	NAME	E	NABLED	MODE	PROTOCOL	SECURITY	ACTIONS			
VPN		vpn1		st.	Client	tcp/1194	none	<b>Z</b> ×			
VPN1											
BRIDGING		Add Instar	nce								
	L										

## (설정이 완료된 화면)

#### **OPENVPN - VPN1**

OpenVPN can work in server mode, waiting for a number of clients to call in, or in client mode, where it connects to a predefined OpenVPN server address.

CONFIGURATION				
Tunnel settings Auth/Crypto Client setting	gs			
Enable virtual network				
State at startup	Up			
	Default is 'up' except for networks with protocol	ol 'none'.		
OpenVPN instance description	Use adown in this network should be brought up a	ny by event rules.		
	vpn1			
	Priendly name for this VPN instance			
Role	Client (calling)	•		
Protocol	ТСР	• 1 · · · · · · · · · · · · · · · · · ·		클라이언트 절성 및 TCP,
	Favor UDP, as TCP leads to potential conflict	s in the TCP over TCP redundancy mechanisms		통신포트 1194를 설정합니다.
Listener port	1194			
Data channel compression	OUP or ICP port that the server will listen to.	and that the client Will call		
Tunnal tuna	Use fast LZO compression	_		
rumer type	(IP) tunnel     (IP) tunnel     (IP) tunnel     (IP) tunnel	¥		
VPN subnet local IP address	10.8.0.2			
	IP address of the local VPN endpoint, not us	ed in TLS client mode since it is pulled from server		
VPN subnet mask	255.255.255.0			
	Subnet mask of the VPN subnet, not used in	TLS client mode		
Keepalive period	10			
	10			
	Keepalive period (seconds). Every such time	a packet is sent to each peer to elicit a response.		
Keepalive timeout	30			
	(2) Keepalive timeout (seconds). Connection ter	ninates if no traffic is received from the peer for such :	ime.	
LOCAL ROUTES				
This section is used in both Server and Client mode	es. It lists the routes to be installed in the local IP stack.			
<ul> <li>In the client, it lists the server subnets reach</li> <li>In the server, it lists the client subnets reach</li> </ul>	nable using the server as gateway, nable using the client as gateway.			
If the gateway is not indicated, it defaults to	the VPN remote address.			
TARGET NET	NETMASK GATEWAY	METRIC	SORT	
192.168.33.0 255.255.25	55.0 10.8.0.1	Default: 0	+ + ×	시비네트워크내역 및
				게이트웨이를 설성합니다.
Add				



(설정이 완료된 화면)

# SETUP > VPN

		SETUP TO	DOLS STATUS							
PHYSICAL INTERFACES	0		ANCES OVERVIEW							
VIRTUAL INTERFACES										
NETWORK	Г	NAME	ENABLED	MODE	PROTOCOL	SECURITY	ACTIONS			
VPN		vpn1	I all a second a seco	Client	tcp/1194	none	2 💌			
VPN1										
BRIDGING		Add Instand	e							
DOUTING / FIDEWALL										

## 공인 IP는 보안상 블라인드 처리되었습니다.

### **OPENVPN - VPN1**

OpenVPN can work in server mode, waiting for a number of clients to call in, or in client mode, where it connects to a pr

No key (entails P2P, cleartext, no auth) * Data channel authentication digest SHA1 (OpenVPN default) * @ Data channel authentication algorithm. Adds overhead to frames size OCAL ROUTES This section is used in both Server and Client modes. It lists the routes to be installed in the local IP stack. In the client, it lists the server subnets reachable using the server as gateway, In the server, it lists the client subnets reachable using the client as gateway. If the gateway is not indicated, it defaults to the VPN remote address. TABGET NET NETMASK GATEWAY	Tunnel settings Auth/Crypto	Client settings			
Data channel authentication digest SHA1 (OpenVPN default) • @ Data channel authentication algorithm. Adds overhead to frames size OCAL ROUTES This section is used in both Server and Client modes. It lists the routes to be installed in the local IP stack. • In the client, it lists the server subnets reachable using the server as gateway, • In the server, it lists the client subnets reachable using the client as gateway. If the gateway is not indicated, it defaults to the VPN remote address. TARGET NET NETMASK GATEWAY	кеу туре		No key (entails P2P, cleartext, no a	uth) 🔻	간난한 테스트를 위해 인증서와 키
CCAL ROUTES  COCAL ROUTES  This section is used in both Server and Client modes. It lists the routes to be installed in the local IP stack.  In the client, it lists the server subnets reachable using the server as gateway, In the server, it lists the client subnets reachable using the client as gateway.  If the gateway is not indicated, it defaults to the VPN remote address.  TARGET NET  NETMASK GATEWAY	Data channel authentication digest		SHA1 (OpenVPN default)	•	설정을 진행합니다.
CAL ROUTES         his section is used in both Server and Client modes. It lists the routes to be installed in the local IP stack.         • In the client, it lists the server subnets reachable using the server as gateway,         • In the server, it lists the client subnets reachable using the client as gateway.         If the gateway is not indicated, it defaults to the VPN remote address.         TARGET NET       NETMASK			Data channel authentication algorithm. Add	overhead to frames size	
CAL ROUTES         his section is used in both Server and Client modes. It lists the routes to be installed in the local IP stack.         • In the client, it lists the server subnets reachable using the server as gateway,         • In the server, it lists the client subnets reachable using the client as gateway.         If the gateway is not indicated, it defaults to the VPN remote address.         TARGET NET       NETMASK					
DCAL ROUTES         This section is used in both Server and Client modes. It lists the routes to be installed in the local IP stack.         • In the client, it lists the server subnets reachable using the server as gateway,         • In the server, it lists the client subnets reachable using the client as gateway.         If the gateway is not indicated, it defaults to the VPN remote address.         TARGET NET       NETMASK					
This section is used in both Server and Client modes. It lists the routes to be installed in the local IP stack.         • In the client, it lists the server subnets reachable using the server as gateway,         • In the server, it lists the client subnets reachable using the client as gateway.         If the gateway is not indicated, it defaults to the VPN remote address.         TARGET NET       NETMASK					
This section is used in both Server and Client modes. It lists the routes to be installed in the local IP stack.         • In the client, it lists the server subnets reachable using the server as gateway,         • In the server, it lists the client subnets reachable using the client as gateway.         If the gateway is not indicated, it defaults to the VPN remote address.         TARGET NET       NETMASK	DCAL ROUTES				
In the client, it lists the server subnets reachable using the server as gateway,     In the server, it lists the client subnets reachable using the client as gateway.  If the gateway is not indicated, it defaults to the VPN remote address.  TARGET NET NETMASK GATEWAY	OCAL ROUTES				
In the client, it lists the server subnets reachable using the server as gateway,     In the server, it lists the client subnets reachable using the client as gateway.     If the gateway is not indicated, it defaults to the VPN remote address.      TARGET NET     NETMASK GATEWAY	CAL ROUTES his section is used in both Server	and Client modes. It lists the ro	outes to be installed in the local IP stack.		
In the server, it lists the client subnets reachable using the client as gateway.  If the gateway is not indicated, it defaults to the VPN remote address.  TARGET NET NETMASK GATEWAY	DCAL ROUTES	and Client modes. It lists the ro	outes to be installed in the local IP stack.		
If the gateway is not indicated, it defaults to the VPN remote address.	OCAL ROUTES This section is used in both Server • In the client, it lists the serv	and Client modes. It lists the ro	outes to be installed in the local IP stack. server as gateway,		
If the gateway is not indicated, it defaults to the VPN remote address.	DCAL ROUTES This section is used in both Server In the client, it lists the serv In the server, it lists the clie	and Client modes. It lists the ro er subnets reachable using the nt subnets reachable using the	outes to be installed in the local IP stack. server as gateway, client as gateway.		
TARGET NET NETMASK GATEWAY	DCAL ROUTES This section is used in both Server In the client, it lists the serv In the server, it lists the clie	and Client modes. It lists the re er subnets reachable using the t subnets reachable using the	outes to be installed in the local IP stack. server as gateway, client as gateway.		
	DCAL ROUTES This section is used in both Server In the client, it lists the serv In the server, it lists the clie If the gateway is not indicat	and Client modes. It lists the ro er subnets reachable using the nt subnets reachable using the ed, it defaults to the VPN remo	outes to be installed in the local IP stack. server as gateway, client as gateway. te address.		
	DCAL ROUTES This section is used in both Server In the client, it lists the serv In the server, it lists the clie If the gateway is not indicat TARGET NET	and Client modes. It lists the ro er subnets reachable using the nt subnets reachable using the ed, it defaults to the VPN remo NETMASK	outes to be installed in the local IP stack. server as gateway, client as gateway. te address. GATEWAY		

### OPENVPN - VPN1

OpenVPN can work in server mode, waiting for a number of clients to call in, or in client mode, where it connects to a

CONFIGURATION	
Tunnel settings         Auth/Crypto         Client settings           Remote OpenVPN server address         Client settings         Client settings	Remote Open/PN server address

OpenVPN 서버가 사용하는 공인 IP를 입력합니다.



# SETUP > ROUTING/FIREWALL > NETWORK ZONES

	SETUP	TOOLS STATUS				
PHYSICAL INTERFACES	NETWORK 7					
VIRTUAL INTERFACES						
NETWORK	NAME	COVERED NETWORKS	FORWARD TO DESTINATION ZONE	NAT ENABLE	LOCAL SERVICES	ACTIONS
VPN	LOCAL	"LOCAL"	LTE VPN_zone		All enabled	<b>Z</b> ×
BRIDGING	LTE	"Cellular"	-	I.	All enabled	2 🗙
ROUTING / FIREWALL	VPN_zone	vpn1	LOCAL LTE		All enabled	2 🗶
DOS PROTECTION MULTICAST ROUTING NETWORK ZONES	Add	zone				

(설정이 완료된 화면)



DNE "LOCAL"	
This section defines common properties of "LOCAL".	
Covered networks specifies which available networks are	e members of this zone.
General Settings Advanced Settings	
Name	LOCAL
Enable NAT	
MSS clamping	
Default acceptance poincy for local services	All enabled (2) You can restrict or open the local se
Covered networks	
	vpn1:
	Cellular:
NTER-ZONE FORWARDING	
The options below control the forwarding policies betwee	n this zone (LOCAL) and other zones. Desti
forwarding rule is unidirectional, e.g. a forward from lan t	o wan does not imply a permission to forward
Allow forwarding to destination zones:	LTE Cellular:
	VPN zone von1; ++
ETWORK ZONES - ZONE SETTINGS	
ETWORK ZONES - ZONE SETTINGS	
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". Covered networks specifies which available networks are	e members of this zone.
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". Covered networks specifies which available networks are	e members of this zone.
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". Covered networks specifies which available networks are General Settings Advanced Settings Name	e members of this zone.
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". <i>Covered networks</i> specifies which available networks are General Settings Advanced Settings Name	e members of this zone.
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". Covered networks specifies which available networks are General Settings Advanced Settings Name Enable NAT	e members of this zone.           VPN_zone           Image: I
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". Covered networks specifies which available networks are General Settings Advanced Settings Name Enable NAT MSS clamping	e members of this zone.  VPN_zone   Only on public zones. Warning
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". <i>Covered networks</i> specifies which available networks are General Settings Advanced Settings Name Enable NAT MSS clamping Default acceptance policy for local services	e members of this zone.  VPN_zone   Only on public zones. Warning  All enabled
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". Covered networks specifies which available networks are General Settings Advanced Settings Name Enable NAT MSS clamping Default acceptance policy for local services	e members of this zone.          VPN_zone         ② Only on public zones. Warning         All enabled         ③ You can restrict or open the local so
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". Covered networks specifies which available networks are General Settings Advanced Settings Name Enable NAT MSS clamping Default acceptance policy for local services Covered networks	e members of this zone. VPN_zone © Only on public zones. Warning All enabled @ You can restrict or open the local so LOCAL:
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". Covered networks specifies which available networks are General Settings Advanced Settings Name Enable NAT MSS clamping Default acceptance policy for local services Covered networks	e members of this zone. VPN_zone © Only on public zones. Warning All enabled @ You can restrict or open the local so UCCAL:
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". <i>Covered networks</i> specifies which available networks are General Settings Advanced Settings Name Enable NAT MSS clamping Default acceptance policy for local services Covered networks	e members of this zone, VPN_zone © Only on public zones. Warning All enabled @ You can restrict or open the local so VOCAL: :: :: :: .:
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". <i>Covered networks</i> specifies which available networks are General Settings Advanced Settings Name Enable NAT MSS clamping Default acceptance policy for local services Covered networks	e members of this zone. VPN_zone
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". <i>Covered networks</i> specifies which available networks are General Settings Advanced Settings Name Enable NAT MSS clamping Default acceptance policy for local services Covered networks	e members of this zone, VPN_zone
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". Covered networks specifies which available networks are General Settings Advanced Settings Name Enable NAT MSS clamping Default acceptance policy for local services Covered networks	e members of this zone.
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". Covered networks specifies which available networks are General Settings Advanced Settings Name Enable NAT MSS clamping Default acceptance policy for local services Covered networks	e members of this zone.  VPN_zone  All enabled  You can restrict or open the local se  Vpn1: ::::  Cellular: :::::::::::::::::::::::::::::::::::
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". Covered networks specifies which available networks are General Settings Advanced Settings Name Enable NAT MSS clamping Default acceptance policy for local services Covered networks  TTER-ZONE FORWARDING Use this section only if NAT is disabled on this zone. The options below control the forwarding policies between	e members of this zone.
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". Covered networks specifies which available networks are General Settings Advanced Settings Name Enable NAT MSS clamping Default acceptance policy for local services Covered networks  TTER-ZONE FORWARDING Use this section only if NAT is disabled on this zone. The options below control the forwarding policies betwee "VPN_zone". The forwarding rule is unidirectional, e.g. a	e members of this zone.
ETWORK ZONES - ZONE SETTINGS ONE "VPN_ZONE" This section defines common properties of "VPN_zone". Covered networks specifies which available networks are General Settings Advanced Settings Name Enable NAT MSS clamping Default acceptance policy for local services Covered networks  TTER-ZONE FORWARDING Use this section only if NAT is disabled on this zone. The options below control the forwarding policies betwee "VPN_zone". The forwarding rule is unidirectional, e.g. a Allow forwarding to destination zones:	e members of this zone.

위의 Add zone을 클릭하여 LOCAL을 설정합니다.

커버하는 네트워크는 해당 영역을 선택합니다.

이 부분은 각 네트워크 영역을 생성한 후에 나타납니다.

LOCAL을 먼저 생성하고 각 영역을 생성한 후에 체크합니다.

위의 Add zone을 클릭하여 VPN\_zone을 설정합니다.

커버하는 네트워크는 해당 영역을 선택합니다.

이 부분은 각 네트워크 영역을 생성한 후에 나타납니다.

VPN\_zone을 생성하고 각 영역을 생성한 후에 체크합니다.



# SETUP > ROUTING/FIREWALL > NETWORK ZONES

	SETUP	TOOLS STAT	TUS			
PHYSICAL INTERFACES	NETWORK	ZONES OVERVIEW				
VIRTUAL INTERFACES						
NETWORK	NAME	COVERED NETWO	RKS FORWARD TO DESTINATION ZONE	NAT ENABLE	LOCAL SERVICES	ACTIONS
VPN	LOCAL	"LOCAL"	LTE VPN_zone		All enabled	2 🗙
BRIDGING	LTE	"Cellular"	-		All enabled	2 🗙
ROUTING / FIREWALL	VPN_zone	e vpn1	LOCAL LTE		All enabled	2 🗶
DOS PROTECTION MULTICAST ROUTING NETWORK ZONES	Ad	d zone				

(설정이 완료된 화면)

### **NETWORK ZONES - ZONE SETTINGS**

Covered networks specifies which available networks an	e members of this zone.
General Settings Advanced Settings	
Name	LTE
Enable NAT	🖉 😰 Only on public zones. Warnir
MSS clamping	
Default acceptance policy for local services	All enabled
	You can restrict or open the local s
Covered networks	🗌 LOCAL: 🚂 👰
	vpn1: 👥
	Cellular:

위의 Add zone을 클릭하여 LTE를 설정합니다.

## 커버하는 네트워크는 해당 영역을 선택합니다.

#### INTER-ZONE FORWARDING

Use this section only if NAT is disabled on this zone. The options below control the forwarding policies between this zone (LTE) and other zones. Destination forwarding rule is unidirectional, e.g. a forward from lan to wan does not imply a permission to forward

Allow forwarding to destination zones:

이 부분은 각 네트워크 영역을 생성한 후에 나타납니다.

기존에 생성한 영역의 체크를 해제합니다.



# OpenVPN 터널링 확인 (서버)

OpenVPN 서버와 클라이언트가 서로 통신을 하기 위한 설정이 모두 끝났습니다. 이제 제품의 상태와 로그 자료를 통해 연결이 잘 되었는지 확인하실 수 있습니다.

# STATUS > NETWORK



#### ROUTES

The following rules are currently active on this system.

ACTIVE IPV4-ROUTES						
NETWORK	TARGET	IPV4-NETMASK	IPV4-GATEWAY	METRIC		
WAN	default	0.0.0.0	192.168.1.1	0		
vpn1	10.8.0.0	255.255.255.0	local	0		
WAN	192.168.1.0	255.255.255.0	local	0		
vpn1	192.168.23.0	255.255.255.0	10.8.0.2	0		
LAN	192.168.33.0	255.255.255.0	local	0		

### SYSTEM LOG

	5	Save	e lo	gs to file	е	
M	on A	pr	1	20:20:3	20 2019	}kern.err kernel: [ 0.604000] Unknow marvell switch ident fff0
M	on A	pr	1	20:20:	20 2019	Jkern.err kernel: [ 0.620000] Unknow marvell switch ident fff0
M	on A	pr	1	20:20:	20 2019	∃kern.err kernel: [ 1.200000] Unknow marvell switch ident fff0
M	on A	pr	1	20:20:	20 2019	∃kern.err kernel: [ 1.772000] Unknow marvell switch ident fffO
M	on A	pr	1	20:20:	29 2019	3 daemon.err acksys_event_handlerd: acksys_event_handlerd: Cannot open /sys/class/gpio/digital_out1/value, alarm '2'
M	on A	pr	1	20:20:	29 2019	daemon.err acksys_event_handlerd: acksys_event_handlerd: Alarm '2' not available, not set/cleared ا
M	on A	pr	1	20:20:	31 2019	J daemon.err block: /dev/ubiO_2 is already mounted
M	on A	pr	1	20:20:	56 2019	}daemon.err acksys_event_handlerd: acksys_event_handlerd: gnss action start_events failed (Not found)



# OpenVPN 터널링 확인 (클라이언트)

공인 IP는 보안상 블라인드 처리되었습니다.

# STATUS > NETWORK

#### SETUP TOOLS STATUS DEVICE INFO INTERFACES NETWORK BRIDGES iiii LOCAL MULTICAST ROUTES ROUTES IP CONFIGURATION WIRELESS IPv4: 192.168.23.1 Netmask: 24 MTU: 1500 CELLULAR DNS server: 211.36.129.4 117.111.29.4 **RX COUNT (IN** SERVICES GRAPH PHYSICAL INTERFACE MAC ADDRESS TX COUNT (IN BYTES) INTERFACE MODE MTU BYTES) LOGS 3150997 ilii 00:09:90:01:1d:3b 13964211 Negotiated 1000 baseTX FD, link ok 1500 LAN1 🛍 VPN1 (VPN1) CONNECTED PEERS REAL ADDRESS BYTES RECEIVED BYTES SENT COMMON NAME Not available 1247641 1751625 CELLULAR IP CONFIGURATION IPv4://///Netmask: 28 MTU: 1500 DHCP info: Lease time: 7200s DNS server: 211.36.129.4 117.111.29.4 **RX COUNT (IN** PHYSICAL INTERFACE TX COUNT (IN BYTES) мти GRAPH MAC ADDRESS INTERFACE MODE BYTES) Operator (home): LG U+ LGU+ SIM: 論 Cellular 00:00:00:00:00:00 4966436 14962637 1500 Password accepted

SETUP TOOLS STATUS

DEVICE INFO	ROUTES								
NETWORK									
BRIDGES MULTICAST ROUTES	The following rules are currently active on this system.								
ROUTES	ACTIVE IPV4-ROUTES								
WIRELESS		NETWORK	TARGET	IPV4-NETMA SK	IPV4-GATEWAY	METRIC			
CELLULAR		Cellular	default	0.0.0.0	223.171.58.0	0			
SERVICES		vpn1	10.8.0.0	255.255.255.0	local	0			
LOGS		LOCAL	192.168.23.0	255.255.255.0	local	0			
		vpn1	192.168.33.0	255.255.255.0	10.8.0.1	0			
		Cellular	223.171.58.0	255.255.255.240	local	0			

### SYSTEM LOG

Save logs to file	
Tue Mar 24 17:27:16 2020 d	daemon.info dnsmasq[1932]: using nameserver 211.36.129.4#53
Tue Mar 24 17:27:16 2020 (	daemon.info dnsmasq[1932]: using nameserver 117.111.29.4#53
Tue Mar 24 17:27:16 2020 (	daemon.notice netifd: Interface 'loopback' is enabled
Tue Mar 24 17:27:16 2020 (	daemon.notice netifd: Interface 'loopback' is setting up now
Tue Mar 24 17:27:16 2020 (	daemon.notice netifd: Interface 'loopback' is now up
Tue Mar 24 17:27:16 2020 (	daemon.notice netifd: Interface 'vpn1' is setting up now
Tue Mar 24 17:27:16 2020 (	daemon.notice netifd: Interface 'wwanO' is setting up now
Tue Mar 24 17:27:16 2020 (	daemon.notice netifd: Network device 'cpuO' link is up (called from cb_rtnl_event:carrier)
Tue Mar 24 17:27:16 2020 (	daemon.notice netifd: Network device 'lo' link is up (called from cb_rtnl_event:carrier)
Tue Mar 24 17:27:16 2020 (	daemon.notice netifd: Interface 'loopback' has link connectivity
Tue Mar 24 17:27:17 2020 F	<pre><ern.info [39.345571]="" down<="" dsa="" dsa.0="" eth0:="" is="" kernel:="" link="" pre=""></ern.info></pre>
Tue Mar 24 17:27:17 2020 (	daemon.err uhttpd[2624]: socket(): Address family not supported by protocol
Tue Mar 24 17:27:17 2020 (	daemon.notice netifd: wwanU (258U): wwan[258U] Using proto:wwan device:/dev/cdc-wdmU iface:wwanU desc:Quectel Eq
Tue Mar 24 17:27:17 2020	laemon.info wwanD: proto omi acksys ol setup wwanD
Tue Mar 24 17:27:17 2020 (	daemon.notice openvpn(vpn1)[2623]: OpenVPN 2.3.10 mips-openwrt-linux-gnu [SSL (OpenSSL)] [L20] [EPOLL] [MH] [IPv
Tue Mar 24 17:27:17 2020 (	Jaemon.notice openvpn(vpn)/12b23): library versions: OpenSSL 1.U.2p 14 Aug 2018, L20 2.10
Tue Mar 24 17:27:17 2020 (	faemon.warn openvpn(vpn1)[2623]: NOLE: the currentscript-security setting may allow this configuration to cal
Tue Mar 24 17:27:17 2020 (	faemon.warn openypn(vpni)[2623]: ******* WARNING *******: all encryption and authentication features disabled
Tue Mar 24 17:27:17 2020 (	Jaemon.notice openvpn(vpn1)(2523): IUN/IAP device tunu opened
Tue Mar 24 17:27:17 2020 (	aaemon.notice openypn(ypn1)[2523]: /etc/openypn/scripts/if-up ypn1 tunu 1500 1503 10.8.0.2 255.255.05.0 init
Tue Mar 24 17:27:18 2020	jaemon.notice netito. wwanu (2500). Setting up wwanu
Tue Mar 24 17-27-19 2020 (	Jaemon.hotice netifid. Network device tunu link is up (called from cb_if_cneck_valid)
Tue Mar 24 17-27-19 2020 (	jaemon, notice netito, interface vpni is now up
Tue Mar 24 17-27-19 2020 (	iser, into queetei-um, cellular, localtime-isocuso439, operator-,ioc-4212, cellid-uE36421, mode-/
Tue Mar 24 17-27-19 2020 (	iser action (incred): Delegine (incred) due to (incred) de (incred) (incred)
Tue Mar 24 17:27:19 2020 1	Iser, no net to expanse (upp1)(2522): Attempting to establish ICD espectics with [AE_INET]
Tue Mar 24 17:27:19 2020 (	Jaemon orr openup(upp))[2023]. Attempting to estatish for connection with [Ar_INE]
Tue Mar 24 17-27-13 2020 1	Jaemonten openyntyphtylaada (n. 1997) - Tor- dommett do (m. 1967) - 1977
Tue Mar 24 17:27:20 2020 (	ser info questel – M: Cellular: Tocaltime=1585038400 operator=16 U+ LGU+ Co=221E, Cellid=D58519 mode=7
Tue Mar 24 17:27:20 2020 (	ser info questel - M: Cellular: Tocaltime=1585038400 operator=16 U+ LGU+ Cel21E cellid=D59819 mode=7
1 de Mai 24 (1-21-20 2020 (	

