

What is NAT

Introducing NAT

Nat allows an organization with unregistered private address to connect to the Internet by translating those addresses into globally registered IP address. You can configure NAT to advertise only one address for the entire network to the outside world. This effectively hides the internal network from the world, thus providing additional security.

One of the main features of NAT is PAT. PAT uses unique source port numbers on the inside global IP address to distinguish between translations. Because the port number is encoded in 16 bits, the total number of internal address that can be translated using NAT to one external address could theoretically be as many as 65536 per IP address.

SIP Traverse over NAT problems

Problem 1:

SIP/SDP is an application-layer protocol but contains IP address/port information, which is not translated by NAT.

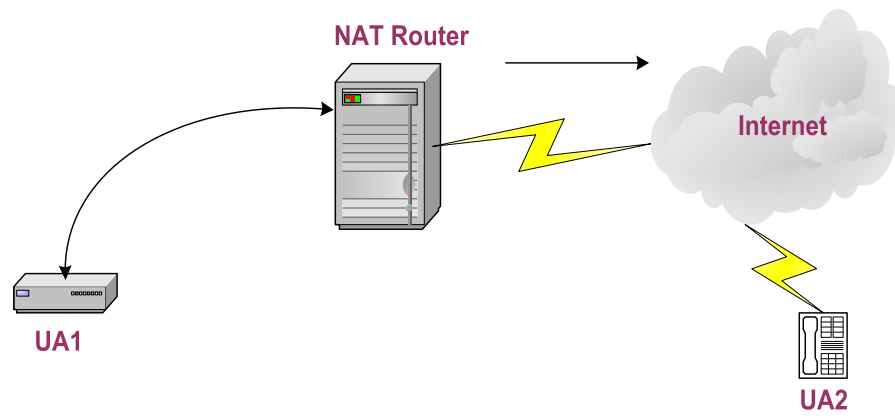
Due to private IP address, the Via and Contact Header fields in SIP messages sent by UA are incorrect.

- With incorrect Via header fields, responses of messages sent by UA1 cannot be routed back.
- With incorrect Contact address in REGISTER messages, call server cannot inform UA1 the incoming calls, the UA1 can only act as a caller.

Problem 2:

When UA1 initiates a call, the connection information (including c and m fields) for media establishment in SDP is incorrect.

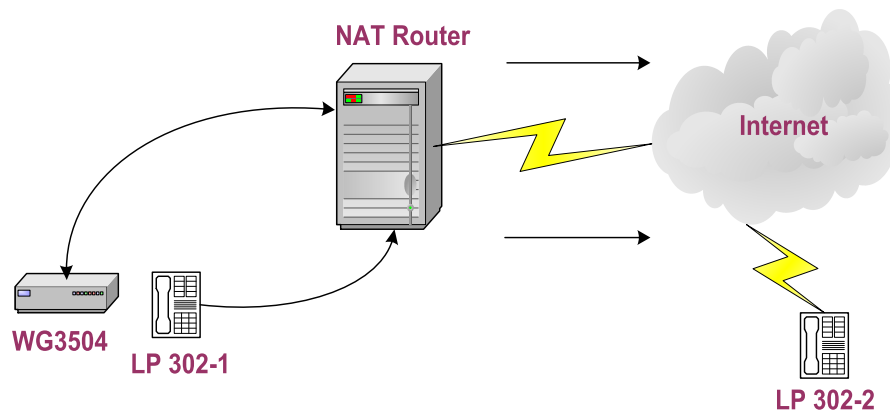
- UA2 obtains a private peer address, the RTP packets from UA2 cannot be routed to UA1.
- Media can only be sent from UA1 to UA2, and one way call issue occurs.



NAT Table	
Private NIC	Public NIC
Inside Local IP Address	Inside Global IP address
192.168.1.1:5060	61.218.41.183:10080

Configuration behind NAT

P2P Mode



WG3504

- IP Information

```
ifaddr -ip 192.168.1.1 -gate 192.168.1.254 -mask 255.255.255.0
ifaddr -ipsharing 1 61.218.41.183 (enable the ipsharing function and input the WAN public IP address)
```
- SIP configuration

```
sip -mode 0 (set to p2p mode)
SIP -line1 351 -line2 352 -line3 353 -line4 354 (set line number for Port 1 to port 4)
```
- Phone Book Configuration

```
pbook -add name lp302-1 ip 192.168.1.2 e164 321 port 5061 (set pbook record for lp302-1)
pbook -add name lp302-2 ip 61.220.126.2 e164 322 port 5060 (set pbook record for lp302-2)
```

LP 302-1

- IP Information

```
ifaddr -ip 192.168.1.2 -gate 192.168.1.254 -mask 255.255.255.0
ifaddr -ipsharing 1 61.218.41.183 (enable the ipsharing function and input the WAN public IP address)
```
- SIP configuration

```
sip -mode 0 (set to p2p mode)
SIP -line1 321 (set line number)
sip -port 5061 (change the SIP listen port to 5061)
sip -rtp 16484 (change the RTP port to 16484)
```

- Phone Book Configuration

pbook –add name 3504-1 ip 192.168.1.1 e164 351 port 5060

pbook –add name 3504-2 ip 192.168.1.1 e164 352 port 5060

pbook –add name 3504-3 ip 192.168.1.1 e164 353 port 5060

pbook –add name 3504-4 ip 192.168.1.1 e164 354 port 5060 (set pbook record for WG3504-1 to 4)

pbook –add name lp302-2 ip 61.220.126.2 e164 322 port 5060 (set pbook record for lp302-2)

Note: Because the 3504 and LP302-1 are behind the NAT router, so you must define different SIP listen port and RTP port for these two CPE.

LP 302-2

- IP Information

ifaddr –ip 61.220.126.1 –gate 61.220.126.177 –mask 255.255.255.240

- SIP configuration

sip –mode 0 (set to p2p mode)

SIP –line1 322 (set line number)

- Phone Book Configuration

pbook –add name 3504-1 ip 61.218.41.183 e164 351 port 5060

pbook –add name 3504-2 ip 61.218.41.183 e164 352 port 5060

pbook –add name 3504-3 ip 61.218.41.183 e164 353 port 5060

pbook –add name 3504-4 ip 61.218.41.183 e164 354 port 5060 (set pbook record for WG3504-1 to 4)

pbook –add name lp302-1 ip 61.218.41.183 e164 321 port 5061 (set pbook record for lp302-1)

NAT Router

In your NAT Router, you must forward the SIP message and voice media to correct destination.

In this example, you must set the “port mapping” function as below:

UDP 5060 ---- > IP 192.168.1.1 (forward SIP port 5060 to WG3504)

UDP 5061 ---- > IP 192.168.1.2 (forward SIP port 5061 to LP302-1)

UDP 16384 to 16391 ---- > IP 192.168.1.1 (forward RTP port to WG3504)

UDP 16484 ---- > IP 192.168.1.2 (forward RTP port 16484 to LP302-1)

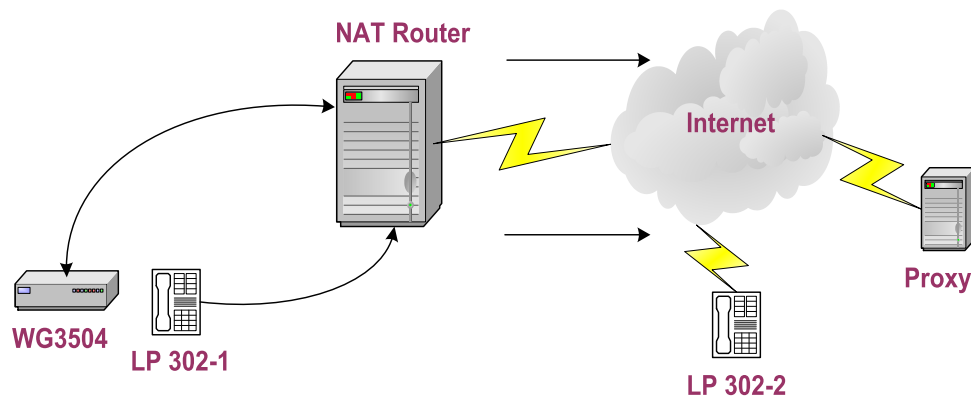
Proxy Mode

There are many methods can go through NAT if CPE is under proxy mode, including **Session Controller; STUN and manual configure.**

The Weltech gateway can support Session Controller and manual configure. The proxy server needs to maintain a table to record the necessary information of all the clients using its service, including IP address; port number and SIP line number..., etc. Some proxy servers can support this feature, such as WellSIP 6500, but some servers can not do it, like SER server. If your server supports this feature, there is no additional configuration needs to set in your CPE, because your Proxy server can handle all the situations. If your server does not support this feature, you need to configure some necessary settings like P2P mode, including "ipsharing function". And you must set different port for different device in the same LAN. Of course, you should set the port mapping function in your NAT Router, too.

Note: If your server can support Session Controller function, we strongly recommend you do not enable the "ipsharing" function in "Network Interface Configuration" page.

Manual configure in Proxy mode



WG3504

- IP Information

```
ifaddr -ip 192.168.1.1 -gate 192.168.1.254 -mask 255.255.255.0
ifaddr -ipsharing 1 61.218.41.183 (enable the ipsharing function and input the WAN public IP address)
```
- SIP configuration

```
sip -mode 1 (set to proxy mode)
sip -px 218.32.223.140 (set proxy IP address)
SIP -line1 351 -line2 352 -line3 353 -line4 354 (set line number for Port 1 to port 4)
```
- Security configuration

```
security -line 1 -name 351 -pwd 351
security -line 2 -name 352 -pwd 352
security -line 3 -name 353 -pwd 353
```

security –line 4 –name 354 –pwd 354 (set registered account and pwd)

LP 302-1

- IP Information

ifaddr –ip 192.168.1.2 –gate 192.168.1.254 –mask 255.255.255.0

ifaddr –ipsharing 1 61.218.41.183 (enable the ipsharing function and input the WAN public IP address)

- SIP configuration

sip –mode 1 (set to proxy mode)

sip –px 218.32.223.140 (set proxy IP address)

SIP –line1 321 (set line number)

sip –port 5061 (change the SIP listen port to 5061)

sip –rtp 16484 (change the RTP port to 16484)

- Security Configuration

security –name 321 –pwd 321 (set registered account and pwd)

Note: Because the 3504 and LP302-1 are behind the NAT router, so you must define different SIP listen port and RTP port for these two CPE.

LP 302-2

- IP Information

ifaddr –ip 61.220.126.1 –gate 61.220.126.177 –mask 255.255.255.240

- SIP configuration

sip –mode 1 (set to proxy mode)

sip –px 218.32.223.140 (set proxy IP address)

SIP –line1 322 (set line number)

- Security Configuration

security –name 322 –pwd 322 (set registered account and pwd)

NAT Router

In your NAT Router, you must forward the SIP message and voice media to correct destination.

In this example, you must set the “port mapping” function as below:

UDP 5060 ---- > IP 192.168.1.1 (forward SIP port 5060 to WG3504)

UDP 5061 ---- > IP 192.168.1.2 (forward SIP port 5061 to LP302-1)

UDP 16384 to 16391 ---- > IP 192.168.1.1 (forward RTP port to WG3504)

UDP 16484 ---- > IP 192.168.1.2 (forward RTP port 16484 to LP302-1)