

NR300 Industrial Cellular VPN Router

Application Note 071

ZeroTier

Version:V1.0.0Date:Oct 2023Status:Confidential





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1. Introduction

1.1 Overview

This document contains information regarding the configuration and use of ZeroTier.

This guide has been written for use by technically competent personnel with a good understanding of the communications technologies used in the product, and of the requirements for their specific application.

1.2 Compatibility

This application note applies to: Models Shown: NR300 router. Firmware Version: V1.1.4 or newer Other Compatible Models: None

1.3 Version

Updates between document versions are cumulative. Therefore, the latest document will include all the content of previous versions.

Release Date	Doc. Version	Firmware Version	Change Description
2023/10/13	V1.0.0	V1.1.4	First released

1.4 Corrections

Appreciate for corrections or rectifications to this application note, and if any request for new application notes please email to: **support@navigateworx.com**



2. Topology



- 1. NR300 router run as ZeroTier Client with any kind of IP and conect the ZeroTier Server.
- 2. PC run as ZeroTier Client with any kind of IP and conect the same ZeroTier Server.
- 3. After ZeroTier tunnels are established, PC and NR300 router be able to PING each other successfully.



3. Configuration

3.1 ZeroTier Server Configuration

1. Go to ZeroTier Official website(https://my.zerotier.com), then navigate to Networks page, then click "Create A Network" Button to create a new ZeroTier Server, the Network ID of our testing is 41d49af6c24b88f0, like below.

Φ ZEROTIER				D	ownload	Knowledge Base	API	Community	Account	Networks	Logout
Your	Networks SEA	Cre RCH networks	ate A Netw	rork							
Netwo	orks: 1	NETWORK ID	NAME*	DESCRIPTION	N SUBI	NET NODES	CRE	ATED			
Autoc	4 A A A A A A A A A A A A A A A A A A A	1d49af6c24b88f0	NR300 TEST	SERVER	172.29)	0.0/16	2023	1-08-04			

2. Then configure the ZeroTier Server like below.

$\overline{\Phi}$ zerotier		Download	Knowledge Base	API Community	Account	Networks	Logout
41d49af6c24b88f0 SERVER							
✓ Settings							
Basics	Network ID Jd43af6c24b88f8 Name MR00 TEST Description SERVER Description Description Server Description Descri						
Advanced	Managed Routes 1/12 1/12 </th <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>						



	Easy		Advanced	
10.147.17.*	10.147.18.*	10.147.19.*	10.147.20.*	
10.144.*.*	10.241.*.*	10.242.*.*	10.243.*.*	
10.244.*.*	172.22.*.*	172.23.*.*	172.24.*.*	
172.25.*.*	172.26.*.*	172.27.*.*	172.28.*.*	
172.29.*.*	172.30.*.*	192.168.191.*	192.1 <mark>6</mark> 8.192.*	
192.168.193.*	192.168.194.*	192.168.195.*	192.168.196.*	
v6 Auto-Assign				
] ZeroTier RFC4193	(/128 for each device)			
ZeroTier 6PLANE (/80 routable for each	device)		
Multicast Recipient	Limit		Broade	cast ble Broadcast
32	t Limit		Broadd Z Ena	c ast ble Broadcast
	: Limit		Broadd ☑ Ena	cast ble Broadcast
32 DNS Requires ZeroTier v Search Domain home.arpa Server Address 10.147.20.190	: Limit ersion 1.6. See Setti	ngs Help below.	Broadd Ena	cast ble Broadcast
32 DNS Requires ZeroTier v Search Domain home.arpa Server Address 10.147.20.190 Submit	: Limit ersion 1.6. See Setti	ngs Help below.	Broadd Ena	cast ble Broadcast
32 DNS Requires ZeroTier v Search Domain home.arpa Server Address 10.147.20.190 Submit Manually Add Men	t Limit ersion 1.6. See Setti	ngs Help below.	Broadd	cast ble Broadcast
32 DNS Requires ZeroTier v Search Domain home.arpa Server Address 10.147.20.190 Submit Vanually Add Men Vode Id	ersion 1.6. See Setti	ngs Help below.	Broadd	cast ble Broadcast
32 DNS Requires ZeroTier v Search Domain home.arpa 10.147.20.190 Submit Manually Add Men Node Id 8badf00d13	ersion 1.6. See Setti	ngs Help below.	Broade	cast ble Broadcast
32 32 DNS Requires ZeroTier v Search Domain home.arpa 10.147.20.190 Submit Manually Add Men Node Id 8badf00d13 Submit	ersion 1.6. See Setti	ngs Help below.	Broadd Ena	cast ble Broadcast
32 32 32 32 32 32 32 32 33 32 34 32 34 34 34 34 34 34 34 34 34 34	ersion 1.6. See Setti nber	ngs Help below.	Broadd	cast ble Broadcast



3.2 Configuration on NR300 router(ZeroTier Client)

1. Go to VPN>ZeroTier>ZeroTier, click Enable button and specify the port.

Overview	Statu	ls	Zerotier						
Link Management	Genera	l Setting	S						
Industrial Interface				Ena	able 🔽				
Network				Local F	Port 9993				
Applications	Networ	k Settin	gs						
VPN	Index	Enable	Description	Network ID	Enable NAT			(Ð
OpenVPN									
GRE Zerotier									
Maintenance									
Huntenance									
							Save	Apply	

2. Click Save>Apply.

3. Enable Network Settings, then specify the Network ID to connect the Zerotier Server.

Overview	Status	Zerotier					
Link Management	General S	ettings					
Industrial Interface		Network Settings					
Network		Network Settings					
Applications	Network		Index	1]		
VPN	Index E		Enable				•
OpenVPN			Description	NR300]		
GRE			Network ID	41d49af6c24b88f0			
 Zerotier 			Enable NAT				
Maintenance					Save	Close	
					Suve	Close	

4. Click Save>Save>Apply. (Note: This is a secondary list, it needs to double click save)

5. Then please do not operate/click anythings, then go to ZeroTier Server Web page, after this page show a new device has joined this Network as below, then check "auth" button to allow NR300 router to join this Network. Or we can manually adds a new device to this network before it joins.

✓ Members
Une device has joined this network.
A ZeroTer network should have at least 2 member devices.
os et az zonten bre applient you tennes to point a zones to Czenolo to. Virit the download coart to act the ano
Search (Address / Name) Display Filter Sort By Authorized Inactive Active Active Active Active INAAuthorized INAAu
(1.1./1) Autor Advance Managellance Managed (Tr. Last Sauge Manipella)
Autri Address Name/Lesciption Managed ins Lastisen version Physical P
□
E-Mail Join Instructions Manually Add Member alice@example.com ####################################
> Members Help
> Flow Rules
> Administrators

Note: If the page do not show a new device join to the network Or the Status of NR300 router is ACCESS_DENIED, please kindly adds a new device to this network manually in ZeroTier Server Web page.

6. Then it will be assigned a IP automatically.

Auth?		Address	Name/Description	Managed IPs	Last Seen	Version	Physical IP	
	ş	a03e42adfc	NR300	172.29.117.138	LECC THAN A MINUTE	100		m 39
		f2:28:75:80:5b:6	5 NR300	+ 172.29.0.x	LESS THAN A MINUTE	1.0.0	UNKNOWN	

7. Go to VPN>ZeroTier>Status, ZeroTier have been connected successfully.

Overview	Stat	us	Zerotier	Reset							
Link Management	Zerotie	er Status									
Industrial Interface					Enable tru	le					
Network				Network	Address a0	3e42adfc					
Applications	Netwo	rk Status									
VPN	Index	Enable	Description	Network ID	Name	MAC	Status	Туре	Device	Assigned ips	
OpenVPN	1	true	NR300	41d49af6c24b88f0	NR300-TEST	f2:28:75:80:5b:66	ОК	PRIVATE	zt1	172.29.117.138/16	
GRE					Index 1						
Zerotier					Enable tru	le					
Maintenance				De	scription NF	1300					
				Ne	twork ID 41	d49af6c24b88f0					
					Name NF	1300-TEST					
					MAC f2	28:75:80:5b:66					
					Status Of	(
					Type PR	IVATE					
					Device zt						
				Assi	gned ips 17	2.29.117.138/16					



3.3 Configuration on PC(ZeroTier Client)

1. Open ZeroTierOne Software on PC, then Right Click ZeroTier software and Join New Network.



、,

		U	^
Enter 16-digit Network ID to Join:			
41d49af6c24b88f0			
1		l	
	_	ancei	Join

3. Then go to ZeroTier Server Web page, after this page show a new device has joined this Network as below, then check "auth" button to allow PC(ZeroTier client) to join this Network.

iearch (Address / Name)	Display Filter					
	Authorized Inactive Not Authorized Active Bridges Hidden	Sort By				
Auth? Address a b 98e7851446 f2:10:ac:47:e2:c	Name/Description NR300 NR300	Managed IPs 172.29.202.228 + 172.29.0x	Last Seen	Version 1.8.8	Physical IP	8
□	(short-name) (description)	+ 172.29.0.x	LESS THAN A MINUTE	-1-1-1	UNICHOWN	8

4. Then it will be assigned a IP automatically.

Auth?		Address	Name/Description	Managed IPs	Last Seen	Version	Physical IP		
	ş	a03e42adfc f2:28:75:80:5b:0	NR300 6 NR300	172.29.117.138 + 172.29.0.x	LESS THAN A MINUTE	1.8.8	UNKNOWN		8
	ş	a2055c8705 f2:2a:4e:9e:71:5	PC	172.29.151.26 + 172.29.0.x	LESS THAN A MINUTE	1.10.6	14.19.8.2	Ì	8



4. Testing

1. Ping from NR300 router to PC(ZeroTier client), it is working correctly.

Overview	Ping Traceroute AT Debug Sniffer					
Link Management	Ping Settings					
Industrial Interface	Host Address 172.29.151.26					
Network	Ping Count 5					
Applications	Local IP Address					
VPN Maintenance Upgrade Software System System Comparation ► Debug Tools	ING 172.29.151.26 (172.29.151.26): 56 data bytes 4 bytes from 172.29.151.26: seq=1 ttl=128 time=40.112 ms 34 bytes from 172.29.151.26: seq=2 ttl=128 time=3.834 ms 4 bytes from 172.29.151.26: seq=2 ttl=128 time=43.00 ms 54 bytes from 172.29.151.26: seq=4 ttl=128 time=12.241 ms					
	Start Stop					

2. Ping from PC(ZeroTier client) to NR300 router, it is working correctly.

C:\Users\Mosen>ping -S 172.29.151.26 172.29.117.138 正在 Ping 172.29.117.138 从 172.29.151.26 具有 32 字节的数据:
来自 172.29.117.138 的回复: 字节=32 时间=481ms TTL=64
来自 172.29.117.138 的回复: 字节=32 时间=3ms TTL=64
来自 172.29.117.138 的回复: 字节=32 时间=11ms TTL=64 172.29.117.138 的回复: 字节=32 时间=11ms TTL=64 就据包: 已发送 = 4, 已接收 = 4, 丢失 = 0 (0% 丢失), 往返行程的估计时间(以毫秒为单位):
最短 = 3ms,最长 = 481ms,平均 = 124ms

3. Test successfully.