

How to use zerotier to connect your remote Observatory from anywhere in the world

[Zerotier](#) has the capabilities of VPN and SD-Wan and can be used without any extra hardware cost. The main reason mostly is that you like to be independent on the remote facility as much as possible. No need to define settings in the border router.

In general, it works like TeamViewer to access the desktop of your remote pc. Which is still handy.

On all your device you need to install a small agent. The agent will arrange extra IP address on the network card besides your existing one. In short zerotier creates a second network private network but then over the internet. Due to zerotier you can access your equipment even with mobile devices everywhere in the world on a secure matter based on IP address.

The below example is a very simple IP connection based, but when diving deeper in to zerotier you can do lot more

In this example in our Remote Observatory we have installed zerotier on the following equipment.

On the Observatory Remote

- Observatory Control System (OCS)(Webserver),
Raspberry PI 4, with node-red Dashboard, MQTT broker, Alpaca Roll off Roof Driver.
- AAG Solo, Weather station of [Lunaticastro](#), (Webserver)
- Allsky Camera (Webserver)
Raspberry Pi 3, with node-red, [AllSky software](#) of Thomas Jacquine
- Windows 10 PC with [Voyager](#) & [ASCOM Remote Server \(ALPACA\)](#)

AT Home/ somewhere in the world

- Mac or windows PC (laptop), one or more
- NAS Synology
- Mobile Phone/Tablet (IOS or Android)

The follow YouTube show in an simple way how Zerotier is working [Remote Access: Securely connect your devices over the internet with ZeroTier](#)

To install zerotier clients check the following link
<https://www.zerotier.com/download/>

See above YouTube video how to create a network on the zerotier website.

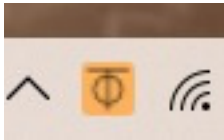
Collect the "**Network-ID Number**" from the site this is need as input for the installation of the clients

To join the created network on each device you need to install the zerotier agent. To access for example the web Dashboard of Voyager. This document gives high level overview how to

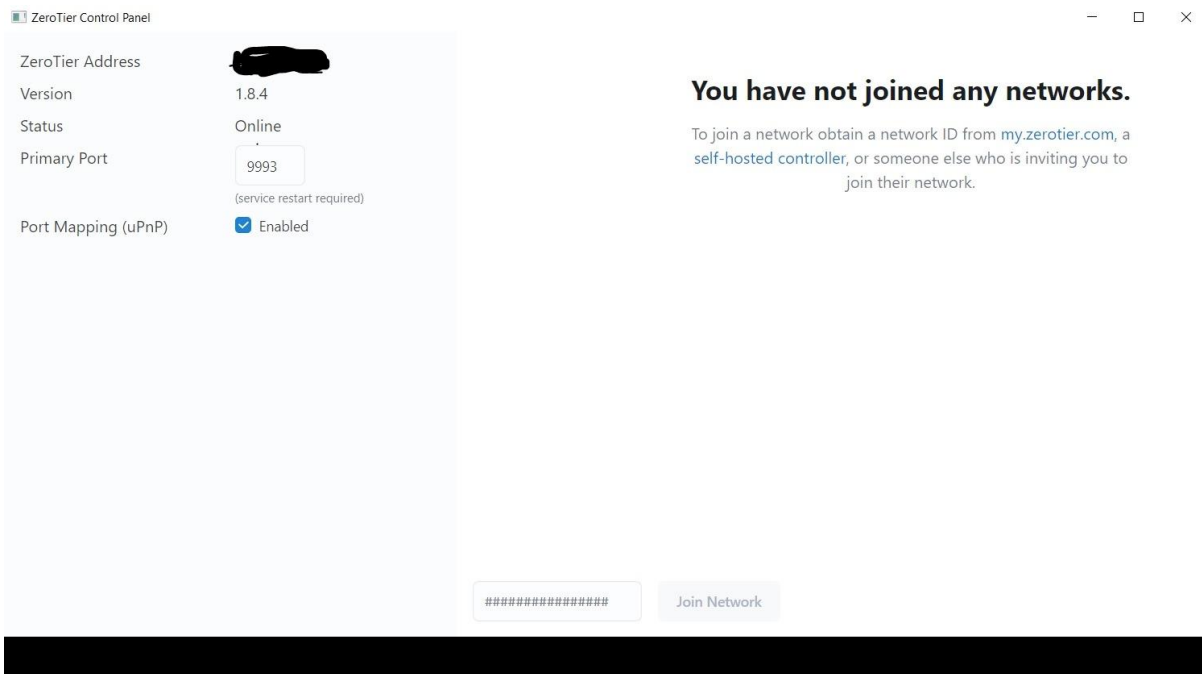
install zerotier and to use. But there are many ways to Rome. Google is good friend to check out any issues. But in general installation is strait forward.

Install Zerotier on Windows.

Download the windows installer and install zerotier. After installation In the active icon bar, you find the symbol of zerotier you can find there the machine address



Right click on the symbol and select open the Control panel, you get the following window

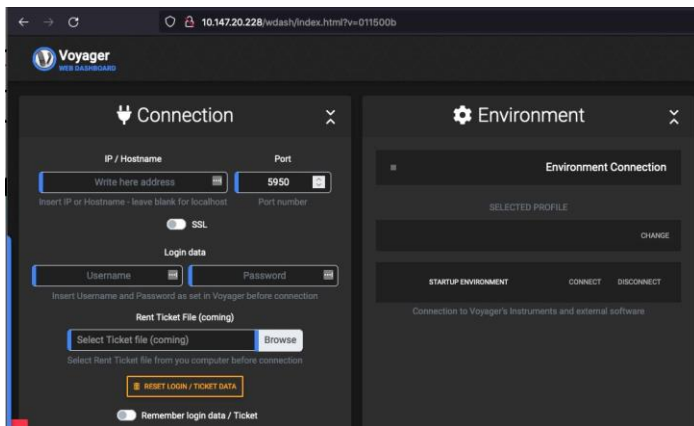


At the bottom you can add the "Network-ID Number" and click join Network

Login on the zerotier website

Click on your network ID you will find the windows PC in de device overview check the device to authorize it to join the network. You will see the IP address which can be used to contact the device





Also install Zerotier client on your management device and you can contact remote your machine. Be aware it's not a method for remote Desktop like teamviewer, VNC or another brand you still need this.

Below example of the web dashboard of voyager on an iPhone



Installation of Zerotier on a synology NAS
<https://docs.zerotier.com/devices/synology/>

The NAS becomes part of your zerotier network, mapping a drive on your remote PC is possible. Images can be direct saved on the NAS. The next morning direct available for processing. Check zerotier website for other NAS brands

Other example for a raspberry client in this case our AAG/SOLO tested for the SOLO 3.0 and higher. **Remark: Installing Zerotier on the AAG/Solo is for own responsibility**

For installing the zerotier on AAG/Solo please check first

<http://lunaticoastro.com/solo-cloud-watcher/moreinfo/>

And check "Tweaking the Solo" Here you find a description how to access the SOLO via SSH (terminal)

When you login please follow the steps below

```
pi@aagsolo:~ $ rootrw
```

```
pi@aagsolo:~ $ curl -s https://install.zerotier.com | sudo bash
```

```
*** ZeroTier One Quick Install for Unix-like Systems
```

```
..... lot of information fly's over the screen
```

```
*** Success! You are ZeroTier address [ 1345168910 ].
```

```
pi@aagsolo:~ $ sudo zerotier-cli status
```

```
200 info 1345168910 1.6.5 ONLINE
```

```
pi@aagsolo:~ $ sudo zerotier-cli join "Network-ID Number"
```

```
200 join OK
```

```
pi@aagsolo:~ $ sudo zerotier-cli listnetworks
```

```
200 listnetworks <nwid> <name> <mac> <status> <type> <dev> <ZT assigned ips>
```

```
200 listnetworks "Network-ID Number" "AAGSOLO" 0e:0e:0e:c2:aa:97 OK PRIVATE
```

```
"xxxxxx" 10.147.20.22/24      <= Your zerotier IP Address of the SOLO is shown here
```

```
pi@aagsolo:~ $ sudo touch /var/lib/zerotier-one/networks.d/Network-ID  
Number.conf
```

```
## Attention replace "Network-ID-Number" collect from the website in above comand
```

```
pi@aagsolo:~ $ sudo reboot
```

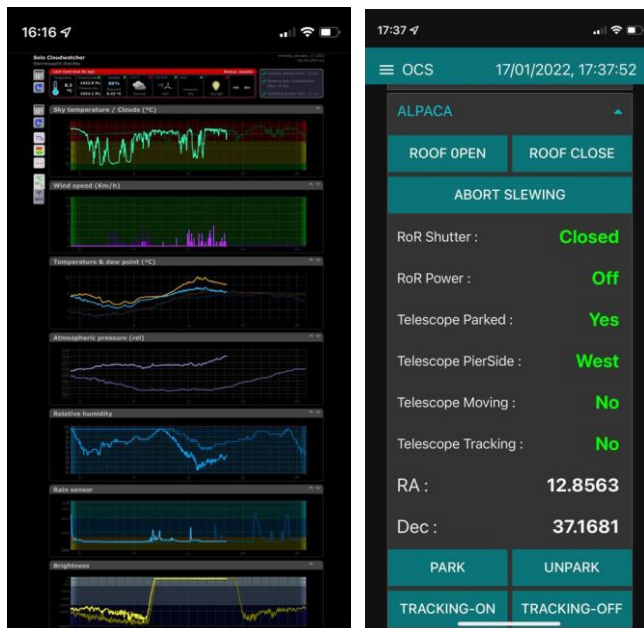
Login on Zerotier

Authorize the SOLO in the central zerotier portal. You can specify your own ip adres if needed.

If you want to access the SOLO from home than you need to install also zerotier client on home PC or your mobile

You need the zerotier IP address to access in the case the AAG/SOLO

Below the example the remote weather station AAG/SOLO and de OCS on iPhone with zerotier active. Be aware the zerotier client must always be activated.



Always when activating a zerotier client authorize the device in the zerotier.com portal otherwise it will never work ;-)

There also possibilities integrate the zerotier network wit your own network and for example assign names to the devices. This tutorial explains only the basics