

Nebula Control Center



nebula

Application Note

Introduction	3
Challenges Today	3
Deploy Networks	5
Feature Highlights.....	5
How to add Nebula device into NCC by QR code -.....	6
Configuration & Upgrade	7
Configure Switch ports across multiple switches –.....	8
VPN	9
2 steps only to configure Site-Site VPN.....	9
Monitor	12
Site-Wide monitoring and reporting.....	12
Troubleshooting	14

▪ Introduction

- Challenges Today

Network is the greatest communications technology that brings people together through convenience, cost efficiency, and ease of integration with other neighboring networks. But it still has some disadvantage that needs improving when engineers maintain and manage these environments.

1. Multiple sites

Most network operators provides network services across multiple sites. Because of this, it takes time for technical engineers to visit each sites to deploy and install their network devices.

2. Insufficient IT manpower & technical knowledge

It is difficult to allocate technical manpower sufficiently for maintaining network services and supports. It also costs more to train technical engineers for more advanced networking knowledge.

3. No unified management systems

Without any unified management system to manage and maintain all the network devices for each sites, network operators have to upgrade software or renew licenses for each individual devices.

4. Transportation time & cost

During a new network deployment, network operators have to transport the network devices from warehouse to site location. This takes time and manpower to deliver all the hardware to end customers.

5. Complexity & time-consuming

Complicated installation or configuration increase the working time for technical engineers setup the network for just one or two sites a day. In addition, it is inconvenient for operators to change device settings or maintain network service across multiple sites.

6. Lack of End-to-End solution

Network operators have to integrate different devices to fulfill the networking requirement at some sites. This may have potential risks, like compatibility or operating issues and proprietary functions which cannot work with devices from other brands.

▪ Network Deployment

- Yesterday



- On-site technicians are needed for deployments
- Time consuming & high transportation cost
- Installation and provisioning process takes time

- Nebula



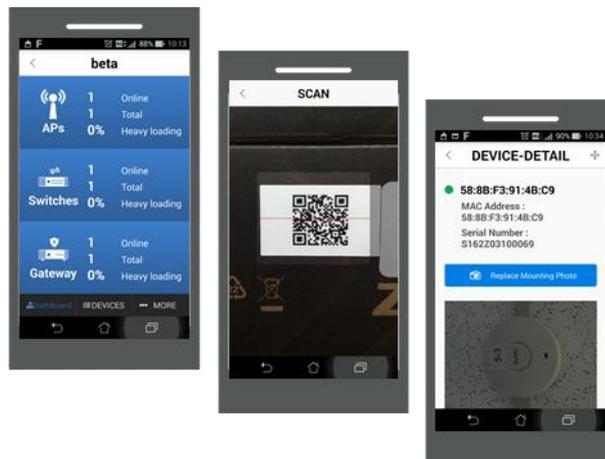
- Nebula Mobile

Nebula Mobile provides a mobile APP that can easily control & locate sites anywhere that requires network deployments.

Feature Highlights

- Built-in QR code scanner for quickly adding hundreds of devices.
- Photo capturing to upload the mounted device's locations.

- Overview of active Nebula APs, Switches and Gateways.
 - Quick selection to view different sites.
- o How to add Nebula device into NCC by QR code -
Before you add device by QR code, it is necessary to have your account with **ORGANIZATION** and **SITE**, and then install the Nebula APP in your cellphone.

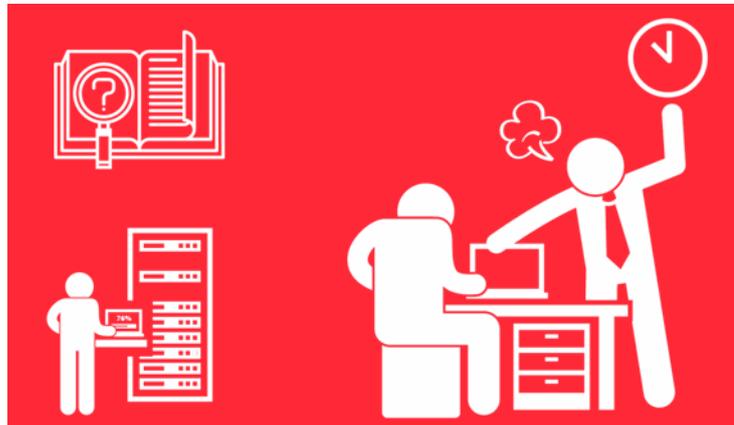


1. Login to your **ORGANIZATION** and **SITE**.
2. Scan the QR code which is labeled on the carton of your device.

You can take a photo of the mounted device to find out where the devices are physically located.

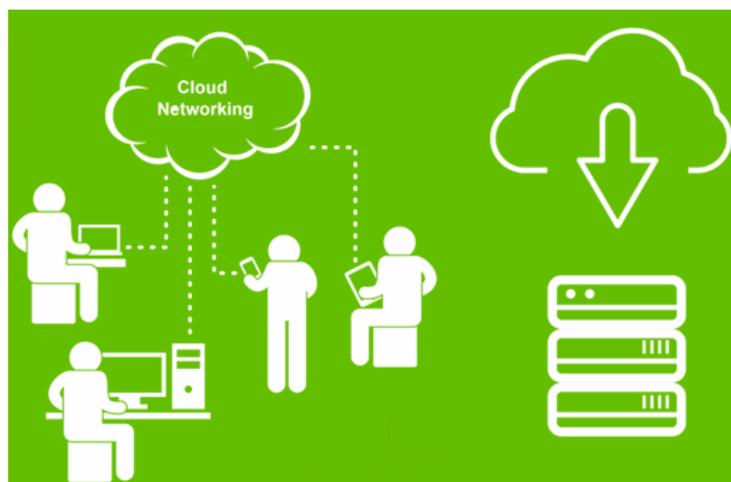
▪ Configuration & Upgrade

- Yesterday



- Complex and repetitive device M-A-C configuration and firmware upgrade.
- Cost a lot of time, effort and manpower to configure networks.

- Nebula



- Provide fast, simple, site-based configuration that are applied to every selected devices with a single click.
- Easy to schedule side-wide firmware upgrade anytime, anywhere.

- Configure Nebula Switch ports across multiple switches –

If you need to reconfigure two network switches with VLAN 10 and 20 fixed at specific ports, it is traditionally necessary to login to every switch to do the configurations.

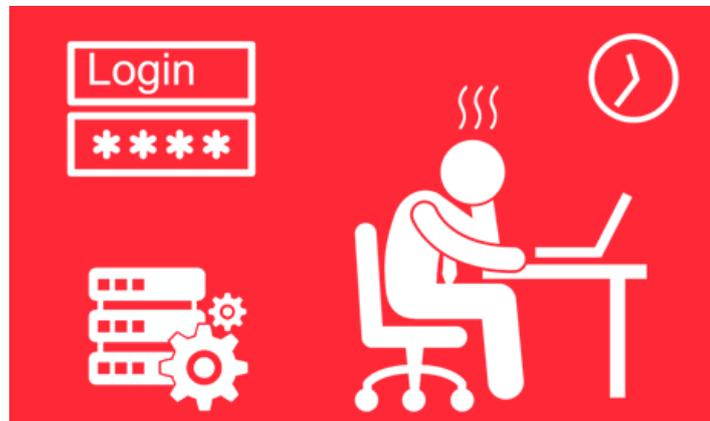
With the Nebula Control Center platform, you only need to configure them all on the same **Switch** page then apply it. It is simple and fast to complete the setup.

SWITCH / PORT	PORT NAME	# PORT	LLDP	RECEIVED BYTES	SENT BYTES	STATUS	POE	TAG
SW101 details		1	Enabled	80.9 KB	1.6 MB	Enabled		
SW102 details		2	Enabled	0 bytes	0 bytes	Enabled		
SW103 details		3	Enabled	130.5 KB	1.5 MB	Enabled		
SW104 details		4	Enabled	168.3 KB	1.3 MB	Enabled		
SW105 details		5	Enabled	0 bytes	0 bytes	Enabled		
SW106 details		6	Enabled	926.4 KB	2.5 MB	Enabled		
SW107 details		7	Enabled	0 bytes	0 bytes	Enabled		
SW108 details		8	Enabled	0 bytes	0 bytes	Enabled		
SW109 details		9	Enabled	0 bytes	0 bytes	Enabled		
SW110 details		10	Enabled	0 bytes	0 bytes	Enabled		
SW111 details	nap102	11	Enabled	1.7 MB	37.3 MB	Enabled		
SW112 details	nap102	12	Enabled	779.7 KB	17.8 MB	Enabled		
SW113 details	nap102	13	Enabled	1.1 MB	10.5 MB	Enabled	3.50 W	
SW114 details	nap102	14	Enabled	1.2 MB	6.7 MB	Enabled	3.50 W	
SW115 details		15	Enabled	0 bytes	0 bytes	Enabled		
SW116 details		16	Enabled	0 bytes	0 bytes	Enabled		
SW117 details		17	Enabled	0 bytes	0 bytes	Enabled		
SW118 details		18	Enabled	0 bytes	0 bytes	Enabled		
SW119 details		19	Enabled	0 bytes	0 bytes	Enabled		
SW120 details		20	Enabled	0 bytes	0 bytes	Enabled		
SW121, 22 LACP details		21, 22	Enabled	0 bytes	0 bytes	Enabled		
SW123 details		23	Enabled	0 bytes	0 bytes	Enabled		
SW124 Uplink details	NSW100	24	Enabled	71.5 MB	11.7 MB	Enabled		
SW125 details		25	Enabled	0 bytes	0 bytes	Enabled		
SW126 details		26	Enabled	0 bytes	0 bytes	Enabled		
SW127 details		27	Enabled	0 bytes	0 bytes	Enabled		
SW128 details		28	Enabled	0 bytes	0 bytes	Enabled		
SW201 details		1	Enabled	0 bytes	0 bytes	Enabled		
SW202 details		2	Enabled	0 bytes	0 bytes	Enabled		
SW203 details		3	Enabled	0 bytes	0 bytes	Enabled		

- Switch 1- Select the port to configure the setting
- Switch 2- Select the port to configure the setting

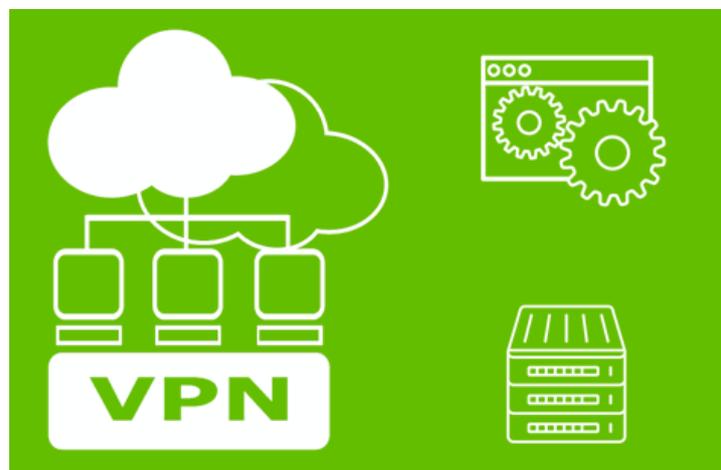
- **VPN**

- Yesterday



- Administrators have to login on each device to configure VPN connections.
 - Complex and repeated procedures

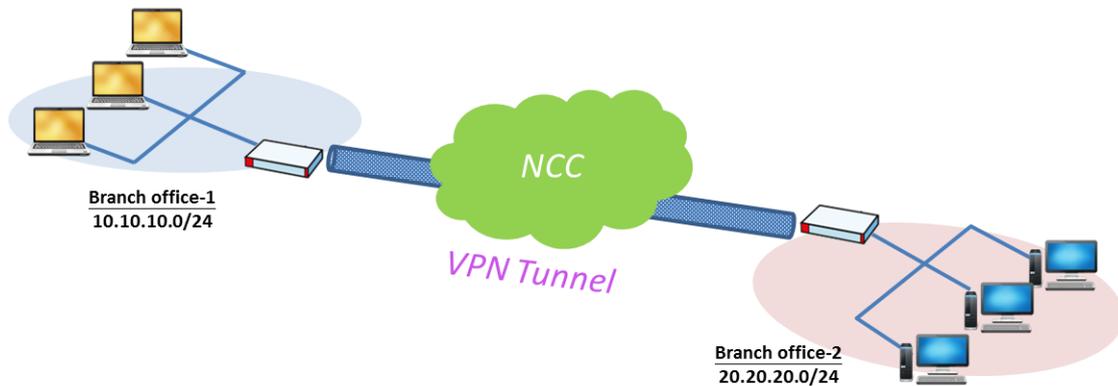
- VPN



- Zero touch site-to-site VPN
 - VPN tunnels are automatically established with just a few clicks on a single platform, without multiple login to every device

- Only two steps to configure Site-to-Site VPN

Simply select the **VPN topology** and **IP network** in each site of the two NSG. VPN tunnel is established, afterwards.



Site1- Branch office-1

- Select the Topology: **Site-to-Site**
- Local networks: LAN1 – 10.10.10.0/24 (**YES** - USE VPN)

Organization: HQ
Site: Branch_office-1

Organization: nebula.cso@gmail.com

SITE-WIDE AP SWITCH **GATEWAY** ORGANIZATION HELP

Site-to-Site VPN

Mode: Split tunnel (send only site-to-site traffic over the VPN)

Topology: **Site-to-Site**

NAT traversal: (IP or FQDN)
Remote VPN peer connect to this Nebula gateway using the public IP address you specify.

Local networks:

NAME	SUBNET	USE VPN
LAN1	10.10.10.0/24	Yes
LAN2	192.168.1.0/24	No

Remote VPN participants:

NETWORK	SUBNET(S)
Branch_office-2	20.20.20.0/24

Site1- Branch office-2

- Select the Topology: **Site-to-Site**
- Local networks: LAN1 – 20.20.20.0/24 (**YES** - USE VPN)

The screenshot shows the ZYXEL nebula web interface for configuring a Site-to-Site VPN. The top navigation bar includes 'SITE-WIDE', 'AP', 'SWITCH', 'GATEWAY', 'ORGANIZATION', and 'HELP'. The 'GATEWAY' tab is active. The page title is 'Site-to-Site VPN'. The 'Organization' is set to 'HQ' and the 'Site' is 'Branch_office-2'. The 'Mode' is 'Split tunnel (send only site-to-site traffic over the VPN)' and the 'Topology' is 'Site-to-Site'. The 'NAT traversal' field is empty. The 'Local networks' table has two rows: 'LAN1' with subnet '20.20.20.0/24' and 'USE VPN' set to 'Yes', and 'LAN2' with subnet '192.168.9.0/24' and 'USE VPN' set to 'No'. The 'Remote VPN participants' table has one row: 'Branch_office-1' with subnet '10.10.10.0/24'.

Organization: HQ

Site: Branch_office-2

Search for...

SITE-WIDE AP SWITCH **GATEWAY** ORGANIZATION HELP

Site-to-Site VPN

Mode: Split tunnel (send only site-to-site traffic over the VPN)

Topology: Site-to-Site

NAT traversal: (IP or FQDN)

Remote VPN peer connect to this Nebula gateway using the public IP address you specify.

Local networks

NAME	SUBNET	USE VPN
LAN1	20.20.20.0/24	Yes
LAN2	192.168.9.0/24	No

Remote VPN participants

NETWORK	SUBNET(S)
Branch_office-1	10.10.10.0/24

▪ Monitor

- Yesterday



- IT with high skillset are needed for network management and monitoring.
- There is a lack or incomplete multi-site unified network monitoring, reporting, or measuring tools.

- Nebula



- 24/7 site-wide monitoring, reporting & measuring.
- MSP portal, and Organization overview for centralized multi-organizations & site management.

Site-Wide monitoring and reporting

Display overall network statistic for the selected site, such as bandwidth usage, power usage, top devices, top clients or SSIDs.

Organization: HQ
Site: Branch_office-1

nebulaco@gmail.com

SITE-WIDE AP SWITCH GATEWAY ORGANIZATION HELP

Site-wide - Summary report

Last week | Email report

Top devices by usage

NAME	MODEL	USAGE	CLIENT
1 10:74:0D:FF:8F:E8	NSG100	8.02 GB	4
2 54:8F:6D:1D:54:6F	NSW100.28P	255.56 MB	10
3 58:8B:F3:91:4B:C9	NAP102	838.69 KB	1

Top SSIDs by usage

SSID	# CLIENT	% CLIENT	USAGE	% USAGE
1 SSID1	1	100 %	1.1 KB	100 %

Clients (Total: 5 distinct client(s)) | Daily Average: 1.38 client(s)

Clients per day

Top clients

DESCRIPTION	USAGE	% USAGE
1 "nony-PC"	6.91 GB	97 %
2 "NSW100"	102.08 MB	2.5 %
3 "nony-PC"	22.11 MB	0.3 %
4 "nap102"	18.24 MB	0.3 %
5 54:AD:50:91:77:1F	1.1 KB	0 %

Usage details

Top switches by power usage

NAME	MODEL	POWER USAGE
1 04:8F:6D:1D:54:6F	NSW100.28P	2357.6 W

Top client device manufacturers by usage

MANUFACTURER	CLIENT	% CLIENT	USAGE	% USAGE
1 ASUS/ASUS COMPUTER INC.	1	100 %	1.1 KB	100 %

Ethernet power

Power rate over time (Avg: 3.6 W Max: 6.5 W Min: 2.4 W)

Top operating systems by usage

OS	# CLIENT	% CLIENT	# USAGE	% USAGE
----	----------	----------	---------	---------

Last login: about 1 hour ago from your current IP address. Make a wish
Copyright © 2016 ZYXEL Communications Corp. All rights reserved | Build version: 8006.20160726.191518

NCC also provides an **EVENT Log** for each Nebula devices in the network.

Nebula AP - Event log

Organization: HQ
Site: Branch_office-1

nebulaco@gmail.com

SITE-WIDE AP SWITCH GATEWAY ORGANIZATION HELP

AP - Event log

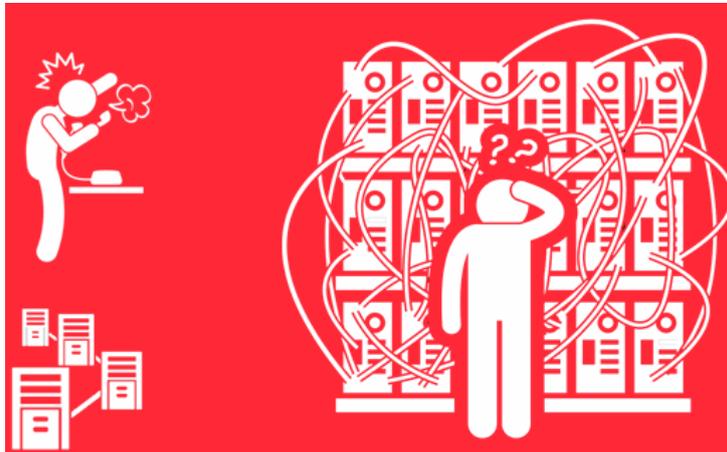
Access point: Any | Keyword: Any | Category: Any | Before: 2016-08-14 09:42 | 6h | Search

< Newer | Older > | 3 Event logs | Export

TIME	ACCESS POINT	CATEGORY	DETAIL
2016-08-14 05:59:08	58:8B:F3:91:4B:C9	wlan-dcs	Radio1 DCS start channel selection procedure
2016-08-14 05:59:09	58:8B:F3:91:4B:C9	wlan-dcs	Radio2 cannot find channel better than current channel 153
2016-08-14 05:59:09	58:8B:F3:91:4B:C9	wlan-dcs	Radio2 DCS start channel selection procedure

▪ Troubleshooting

- Yesterday



- Hard to locate devices especially for wireless Aps.
- Difficult to perform remote troubleshooting.

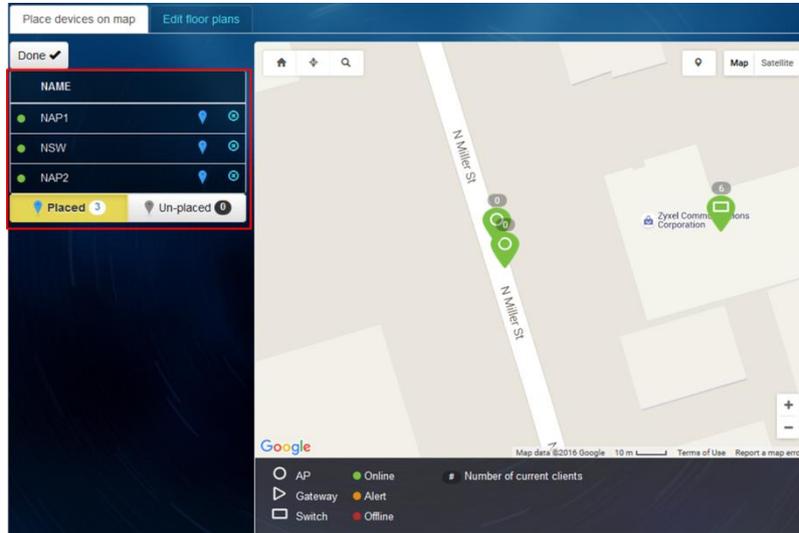
- Nebula



- Map & floor plan with Geo-IP and add a mounting photo using Nebula Mobile to help identify and record the physical locations of Nebula devices on the NCC.
- Automated topology and Live tools for easy, remote troubleshooting.

Site-WIDE → Map & floor plan

- ✧ Place devices on map



- ✧ Floor plan

