

Contents

1 Microbranch and Zscaler Integration ..... 2

1.1 Before You Start ..... 2

1.2 Zscaler Configuration..... 2

1.3 Aruba Central Configuration ..... 4

1.4 Integration Verification ..... 7

1.5 Policy Based Routing Configuration ..... 10

1.6 User Testing ..... 11

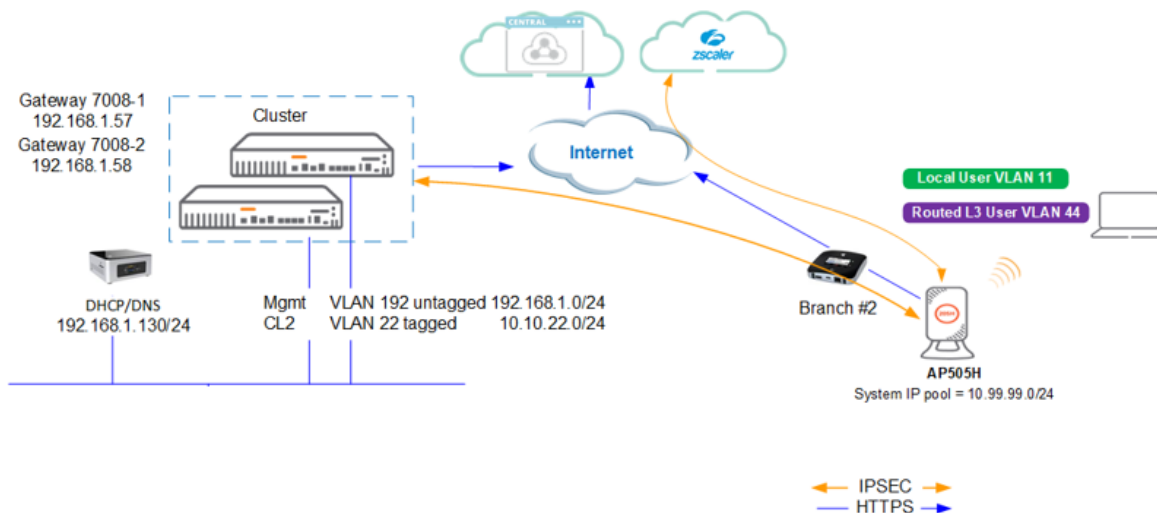
Revision History

DATE	VERSION	EDITOR	CHANGES
10 May 2024	0.1	Ariya Parsamanesh	Initial creation
30 Jun 2024	0.2	Ariya Parsamanesh	Added User Testing section

# 1 Microbranch and Zscaler Integration

The Microbranch (MB) solution can be seamlessly integrated with leading cloud security providers such as Zscaler through the Aruba Central "Cloud Connect" service. This integration facilitates the establishment of a secure connection between the Microbranch AP and one or multiple cloud-hosted enforcement control points. Specifically, in the case of Zscaler, this connection is established with Zscaler Internet Access (ZIA) Public Service Edges.

ZIA is basically an Internet onramp, which will be the next hop to the Internet bound traffic from MB. Aruba Central cloud connect service automatically orchestrates IPSEC tunnels and gets MB to connect to ZIA Public Service Edges. These IPSEC tunnels use Internet Key Exchange (IKE) protocol which provides the ability to traverse NAT boundaries and leverage IKEv2 for authentication, while at the same time limiting the overhead.



## 1.1 Before You Start

I am assuming you have a working Microbranch setup which means the MB access point is

- added and subscribed with Advance AP foundation license in Aruba Central
- configured and part of the AOS10 microbranch group.
- Running the latest firmware in AOS 10.5.x.x or 10.6.x.x series.

## 1.2 Zscaler Configuration

You need to login to the Zscaler cloud portal <https://admin.zscalerthree.net/> to enable API integration between it and Aruba Central. For the API integration between the two we need an API key and user credentials.

First, we need to configure Zscaler for API access by going to Administration >> Partner Integrations >> SD-WAN and add a Partner key.

ZIA

Dashboard

Analytics

Policy

Administration

### Partner Integrations

Microsoft Cloud App Security

SD-WAN

Azure Virtual WAN

CrowdStrike

Microsoft Defender for Endpo...

+ Add Partner Key

No.	Partner Name	Key	Last Modified By	Last Modified On
-----	--------------	-----	------------------	------------------

Select the HPE Partner name for the SD-WAN Type and when you are finished, you should get the API key.

Partner Integrations

Microsoft Cloud App Security SD-WAN Azure Virtual WAN NEW CrowdStrike NEW Carbon Black NEW Microsoft Defender for Endp

+ Add Partner Key

No.	Partner Name	Key	Last Modified By	Last Modified On
1	HPE Aruba	[Redacted]	[Redacted]	[Redacted]

Next, for the user credentials to be used with the API key, we'll create Partner Administrator Role by going to Administration >> Role Management and creating one. Ensure your login role has access to Locations, VPN Credentials, Static IP and GRE Tunnels. In my case the sdwan-admin role has that access.

Edit Partner Administrator Role

ADMINISTRATOR ROLE

Name

sdwan-admin

PERMISSIONS

Access Control

Full View Only

PARTNER ACCESS

SD-WAN API Partner Access

☒ Locations

☒ VPN Credentials

☒ Static IP

☒ GRE Tunnels

In my case the sdwan-admin role has that access, and finally assign this admin-role to the admin user credential.

Administrator Management

Administrators UPDATED Auditors Administrator Management

+ Add Administrator + Add Partner Administrator + Add Executive Insights Ap...

Search...

No.	Login ID	Name	Role	Scope	Login Type	Comments	Password E...	Status	Type
1	ariya	Ariya	sdwan-admin	Organization	Password	---	false	Enabled	Partner Admin
2	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
3	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
4	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]

use this login credentials along with the Key from (Administration > Partner integration) to configure the Zscaler account in Aruba Central.

## 1.3 Aruba Central Configuration

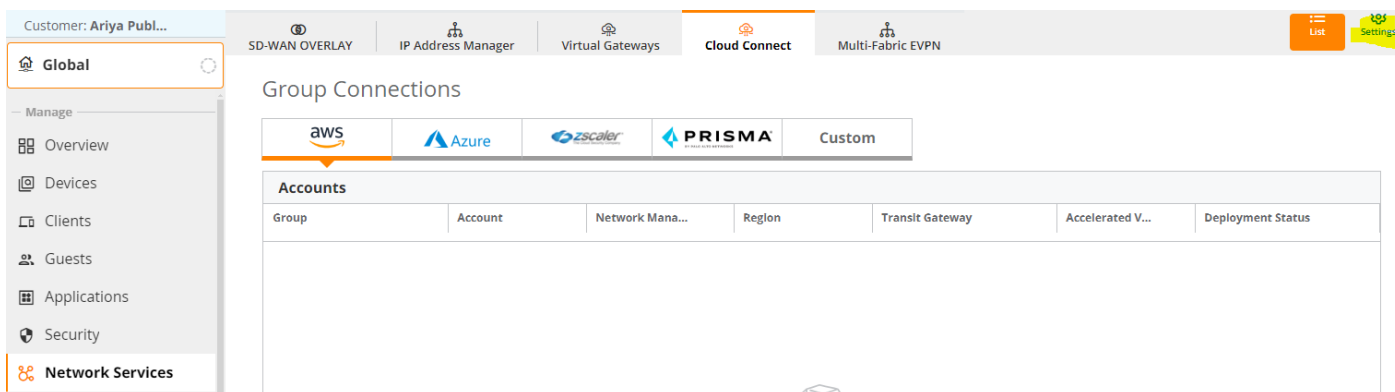
There are a few things you need to note before starting.

- Zscaler integration through Cloud Connect service for Microbranch APs requires firmware AOS 10.3.x
- Microbranch APs require an Advanced AP license for Zscaler integration through Cloud Connect service.

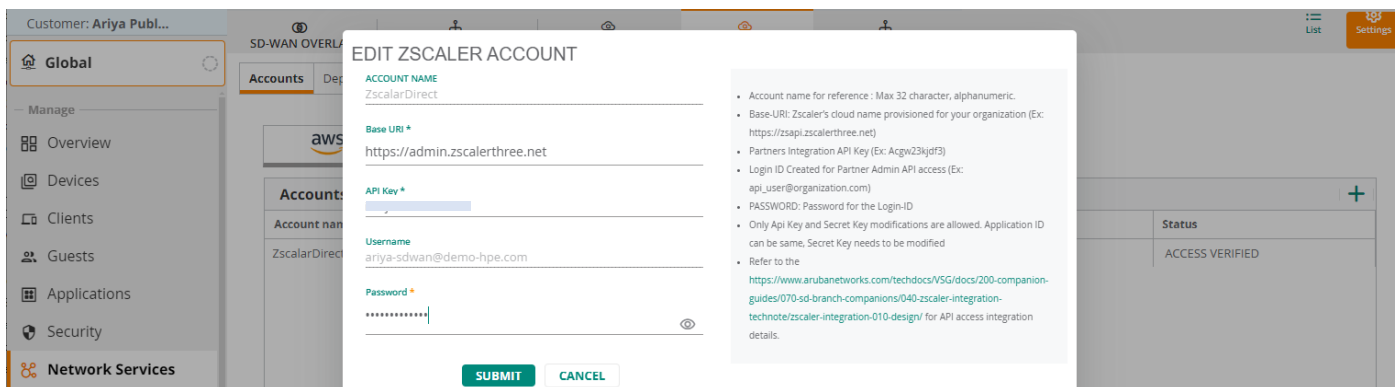
The main tasks are

1. Adding a Cloud Provider Account in Aruba Central
2. Enabling Orchestrating Zscaler tunnels to select groups.

Here we'll start with adding the Zscaler account in Aruba Central, by going selecting Network Services and clicking on the Cloud Services tab and then the setting icon.



Select the Zscaler tab and add the new account.



Here is the side note that is displayed when you are adding/editing the Zscaler account.

- Account name for reference : Max 32 character, alphanumeric.
- Base-URI: Zscaler's cloud name provisioned for your organization (Ex: https://zsapi.zscalerthree.net)
- Partners Integration API Key (Ex: Acgw23kjdf3)
- Login ID Created for Partner Admin API access (Ex: api\_user@organization.com)
- PASSWORD: Password for the Login-ID
- Only Api Key and Secret Key modifications are allowed. Application ID can be same, Secret Key needs to be modified.
- Refer to the <https://www.arubanetworks.com/techdocs/VSG/docs/200-companion-guides/070-sd-branch-companions/040-zscaler-integration-technote/zscaler-integration-010-design/> for API access integration details.

Once you save it you get this display with status being INIT.

The screenshot shows the 'Cloud Connect' section of the interface. The 'Accounts' tab is selected, and the 'Zscaler' provider is chosen. The 'Accounts' table displays the following data:

Account name	Base URI	Username	API Key	Status
ZscalerDirect	https://admin.zscalerthree.net	ariya		INIT

This might take few minutes, be patient.

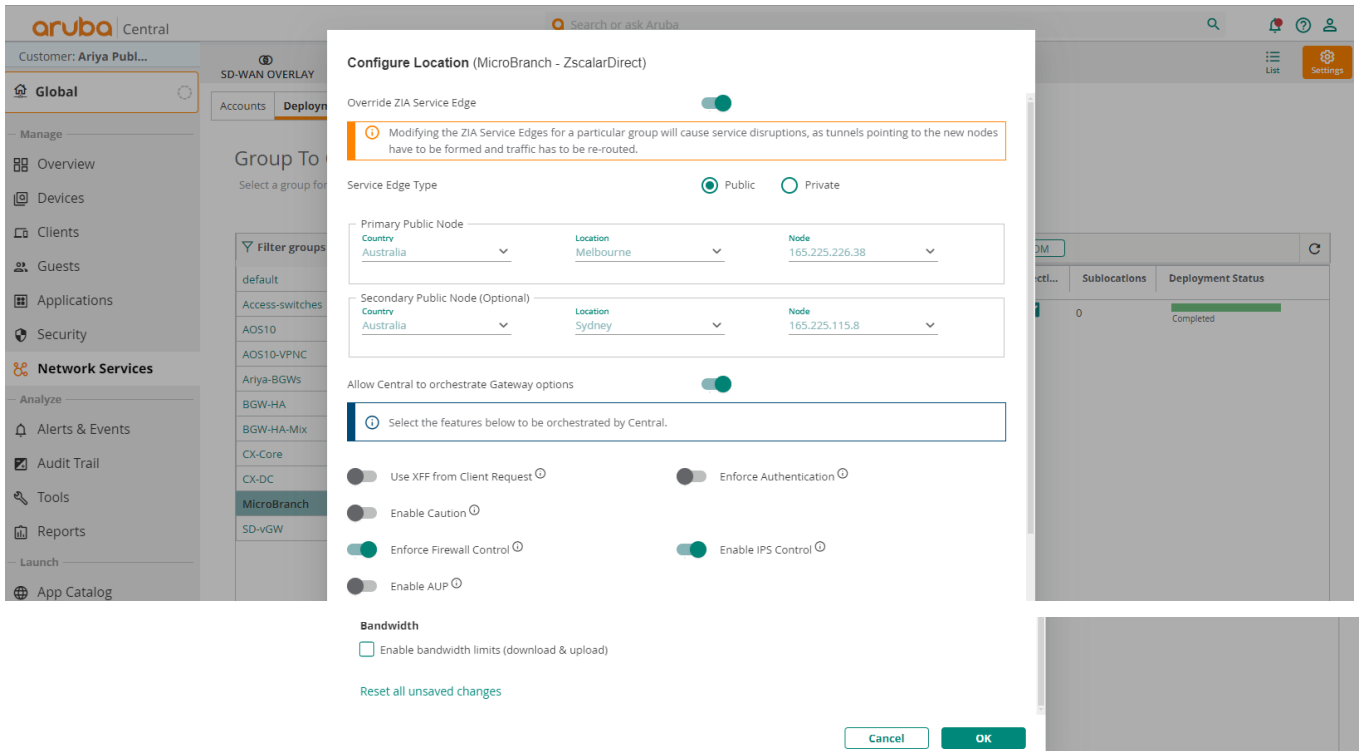
The screenshot shows the 'Cloud Connect' section of the interface. The 'Accounts' tab is selected, and the 'Zscaler' provider is chosen. The 'Accounts' table displays the following data:

Account name	Base URI	Username	API Key	Status
ZscalerDirect	https://admin.zscalerthree.net	ariya		ACCESS VERIFIED

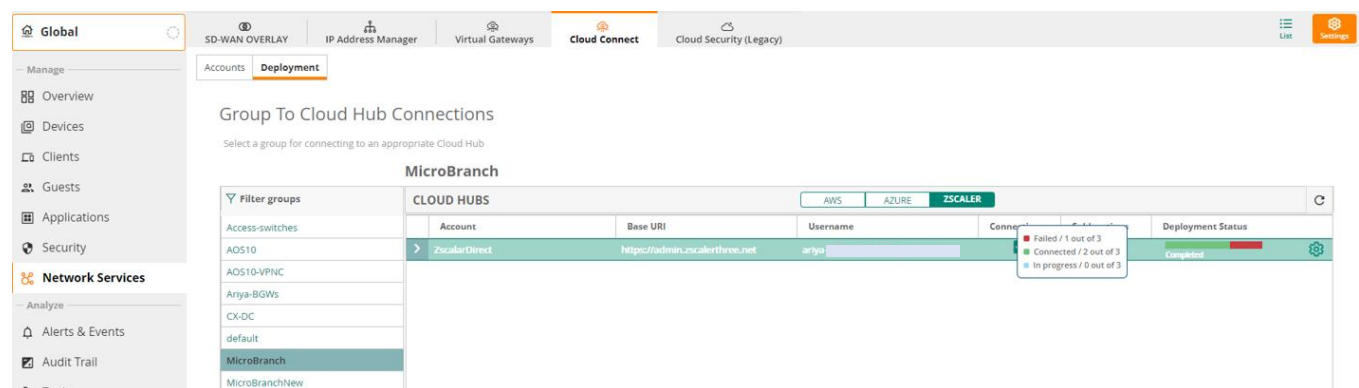
Now that the account status is “Access Verified”, we click on the “Deployment” tab and choose the group that you want to associate the Zscaler account with, in my case it’s the microbranch group.

The screenshot shows the 'Cloud Connect' section of the interface. The 'Deployment' tab is selected. The 'Group To Cloud Hub Connections' section displays the following data:

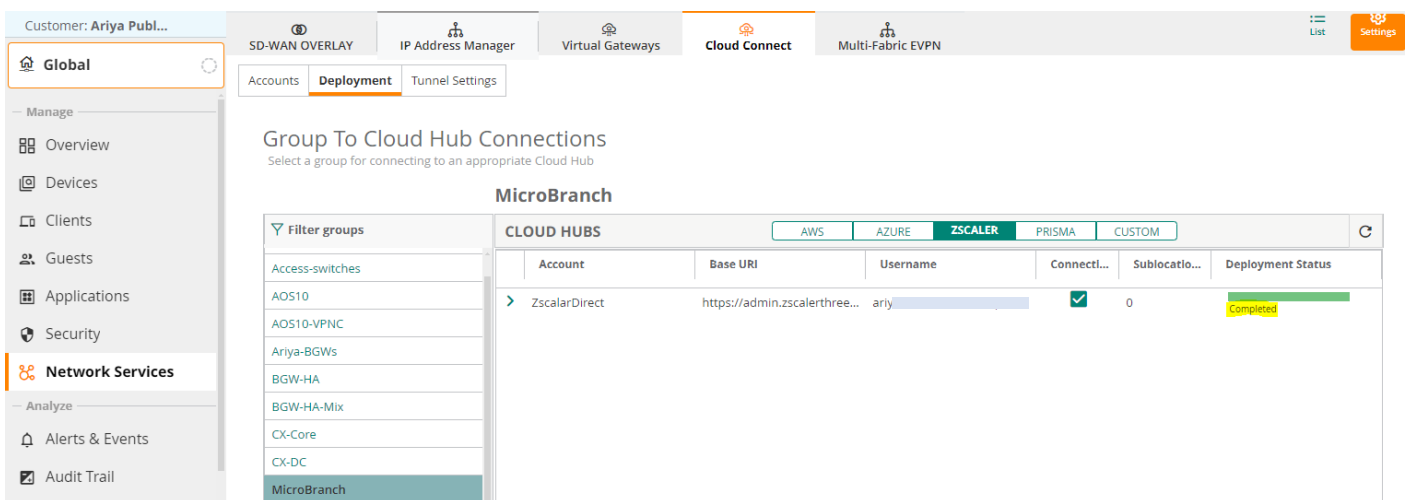
Filter groups	Account	Base URI	Username	Connect...	Sublocatio...	Deployment Status
Access-switches	ZscalerDirect	https://admin.zscalerthree...	ariya	<input checked="" type="checkbox"/>	0	
AOS10						
AOS10-VPNC						
Ariya-BGWs						
CX-DC						
default						
MicroBranch						
MicroBranchNew						
SD-WGW						



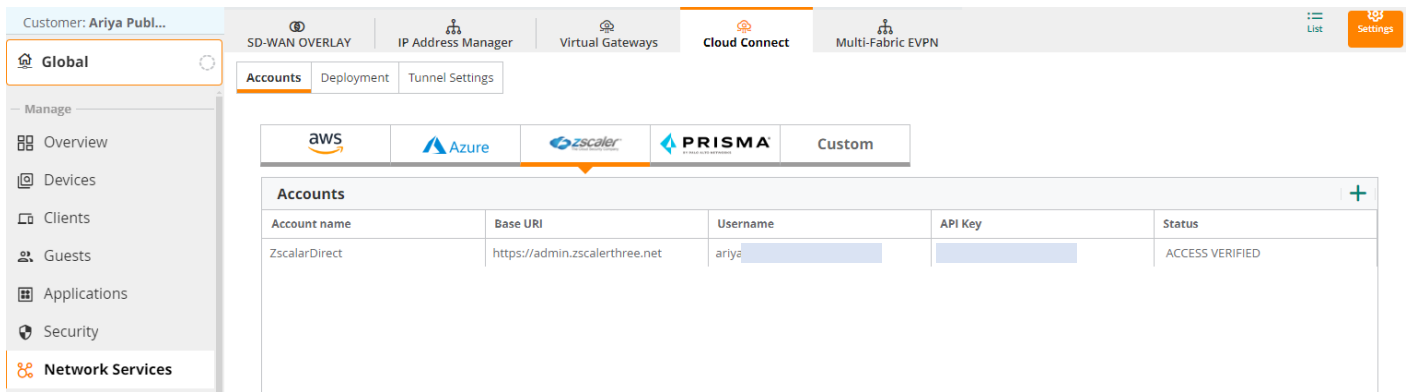
You then need to select Preview at the bottom of the page and Submit.



This will take a few minutes.



Once this is done, you can see it under accounts as shown below.



## 1.4 Integration Verification

At this point the devices (in my case APs) in that group which you have just setup Zscaler orchestration for, should have by now established the IPSEC tunnels.

The WebUI will take some time, but for now use the CLI to verify, remember that ZIA tunnels will use ISAKMP.

```
MicroBranch2# sh crypto-local isakmp key

ISAKMP KEY
-----
IP/FQDN          KEY                                     HEX
-----
165.225.115.8/32  57fb1df199583b2d803<strings removed>444199161880b27191becb  N
165.225.226.38/32  6719bf025333adsdsds<strings removed>595810be92b8f457a6dsds  N
Total ISAKMP KEY Count: 2

MicroBranch2#
```

```
MicroBranch2# sh crypto isakmp dpd

IPSEC MAP DPD STATS
-----
MAP NAME          PEER IP          REQUEST SENT  REQUEST RESENT  REPLY
RECVD  REQUEST RECVD  REPLY SENT  PEER_DEAD
-----
zs-init-zscalarsdirect-primary-lte-uplink  165.225.226.38  0            0            0
0            0            0
zs-init-zscalarsdirect-primary-e0-uplink    165.225.226.38  230          0            230
0            0            0
zs-init-zscalarsdirect-secondary-e0-uplink  165.225.115.8   229          0            229
0            0            0
zs-init-zscalarsdirect-secondary-lte-uplink  165.225.115.8   0            0            0
0            0            0
Total IPSEC MAP Count: 4

MicroBranch2#
```

Note that microbranch APs use Overlay Agent Protocol (OAP) to connect to Aruba Central Route/Tunnel orchestrator to get the all the information about routing and tunnels that needs to be established.

```
MicroBranch2# sh l3d oap tunnels

L3D OAP Tunnel Table
-----
Peer MAC          Map Name          Map Id  State  GenId
Pair UUID
-----
20:4c:03:0a:b9:e0 gw-ipsecmap-20:4c:03:0a:b9:e0-e0-uplink  0x50001  Up    119768693
019cbfdf-a087-4b72-b1ab-0612c0de2a69
276a6d41-b41c-4676-8bd2-f3e2cbc2036e  zs-init-zscalarsdirect-primary-e0-uplink  0x50003  Up    119768694
```

```

zs-init-zscalarsdirect-secondary-e0-uplink 0x50004 Up 119768695
6d4017ef-94c1-4aaf-8957-703ee72c0bb4
MicroBranch2#

```

Next, we'll check the IPSEC stats.

```

MicroBranch2# sh crypto ipsec stats

IPSEC STATS
-----
MAP NAME                                IP ADDR          DEVNAME  TX/RX PACKETS  TX/RX BYTES
TX/RX DROPS  TX/RX ERRORS
-----
gw-ipsecmap-20:4c:03:0a:b9:e0-e0-uplink 194.223.11.109  tun0     33402/31319
3732456/3418448  0/0          0/0
gw-ipsecmap-20:4c:03:0a:b9:e0-lte-uplink 194.223.11.109          0/0          0/0
0/0          0/0
zs-init-zscalarsdirect-primary-e0-uplink 165.225.226.38  tun1     18750/36423
1714608/37751975  0/0          0/0
zs-init-zscalarsdirect-secondary-e0-uplink 165.225.115.8  tun2      0/0          0/0
0/0          0/0
zs-init-zscalarsdirect-secondary-lte-uplink 165.225.115.8          0/0          0/0
0/0          0/0
zs-init-zscalarsdirect-primary-lte-uplink 165.225.226.38          0/0          0/0
0/0          0/0
Total IPSEC Count: 6

MicroBranch2#

```

Finally you can also use the following command to see more details about the tunnels that are established from the AP.

```

MicroBranch2# sh ata endpoint status

ATA Endpoint Status
-----
UUID                                IP ADDR          STATE          TUN DEV  TUN
SPI(OUT/IN)  LINK TAG  VALID TIME(s)  TUNNEL TYPE  GRE VLANs  HBT(Jiff/Missd/Sent/Rcv)
INNER IP      UP TIME(s)
-----
60fbe82a-19a7-4ecb-8eff-34a6fd946127 203.214.83.128  SM_STATE_CONNECTED  tun0
af5b0800/c5f9e000  E0-Uplink  124970          GREoIPSec  1,22,192,4094  4993/0/4618/4618
10.99.99.4  2024-04-11 10:06:11
aea605cf-7d2e-486a-941a-c64394938471 203.214.83.128  SM_STATE_INIT
96bd8100/2e4a900  LTE-Uplink  129567          GREoIPSec  1,22,192,4094  0/0/0/0
10.99.99.4  1970-01-01 11:00:00
f9c5cc3b-c3ce-44a6-af73-e4e0f229aab6 165.225.226.38  SM_STATE_CONNECTED  tun1
30d3f7f0/2ce43b00  E0-Uplink  24182          IPSEC      NULL         0/0/0/0
10.99.99.4  2024-04-11 10:06:20
49437d16-d6f2-4676-b4ad-1cc2b5af8e70 165.225.115.8  SM_STATE_INIT
LTE-Uplink  -4993          IPSEC      NULL         0/0/0/0          0/0
1970-01-01 11:00:00          N/A
62e670ed-c134-4859-bc42-d1cbebc0019a 165.225.115.8  SM_STATE_CONNECTED  tun2
1524b377/4da09e00  E0-Uplink  24203          IPSEC      NULL         0/0/0/0
10.99.99.4  2024-04-11 10:06:40
29b6476c-b9b3-42ee-8bea-964dd27fffeef 165.225.226.38  SM_STATE_INIT
LTE-Uplink  -4993          IPSEC      NULL         0/0/0/0          0/0
1970-01-01 11:00:00          N/A
Total Endpoints Count: 6

MicroBranch2#

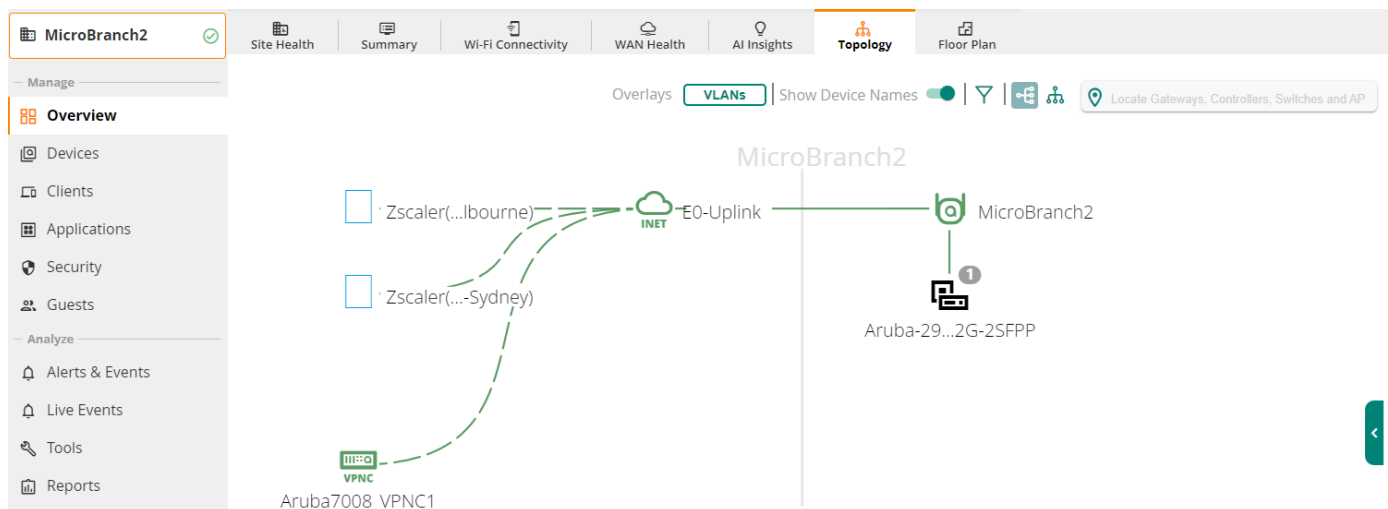
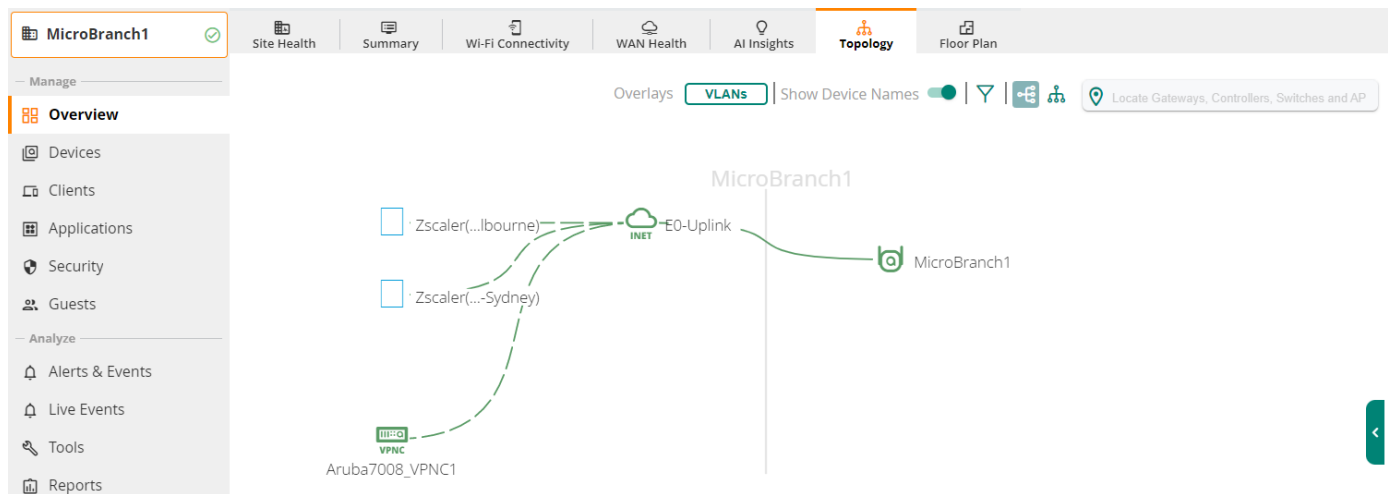
```

You should be able to see the new location in Zscaler portal as well. You need to search for the Aruba Central group name that you enabled for Zscaler orchestration.

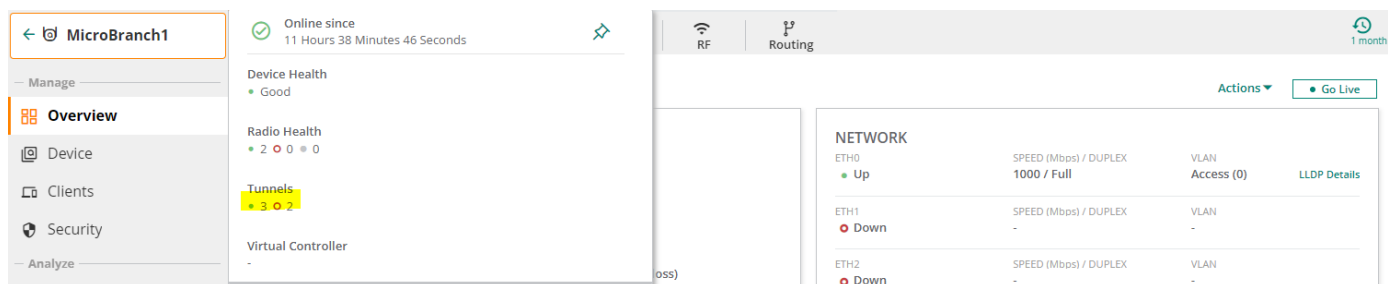


Location Management													
Locations (5)   Location Groups (12) UPDATED   Azure Virtual WAN Locations (0) NEW													
Add Location   Import Locations   Download CSV   Sample Import CSV file													
No.	Name	IP Address	Description	Proxy	Use XF	Auth	Fire	Band	Virtu	IPS C	Group	Man	Loca
1													
2													
3													
4	MicroBranch1...	---	---	---	---	---	Enabled	---	---	Enabled	Unassig...	HPE Aru...	Corpora...
5	MicroBranch2...	---	---	---	---	---	Enabled	---	---	Enabled	Unassig...	HPE Aru...	Corpora...

After some time you should be able to the Zscaler tunnels in corresponding Site topology view



You should also be able to see the tunnels as well.



MicroBranch1

Manage

Overview

Device

Clients

Security

Analyze

Live Events

Alerts & Events

Audit Trail

Tools

VPN

VPN

GATEWAY

VPNC TUNNELS SUMMARY

TOTAL	UP	DOWN	PEERS
5	3	2	3

Tunnel	Status	Source	Destination
vpn_tun_gw-ipsecmap_165.225.114.24_0 Primary (Active)	Down	10.99.99.7	165.225.114.24
vpn_tun_gw-ipsecmap_165.225.226.38_0 Primary (Active)	Up	10.99.99.7	165.225.226.38
vpn_tun_gw-ipsecmap_27.32.172.235_0 Primary (Active)	Down	10.99.99.1	192.168.1.57
vpn_tun_gw-ipsecmap_165.225.115.8_0 Primary (Active)	Up	10.99.99.7	165.225.115.8
vpn_tun_gw-ipsecmap_194.223.11.109_0 Primary (Active)	Up	10.99.99.7	192.168.1.57

## 1.5 Policy Based Routing Configuration

You need to configure a Policy Based Routing (PBR) and then associate it with a user role, in order to redirect some traffic to ZIA tunnels. Here we want the Internet traffic to be policy routed through the ZIA tunnels.

1. Create a RFC1918 alias to group all the private IP subnets.

MicroBranch

Manage

Overview

Devices

Clients

Guests

Applications

Security

Analyze

Alerts & Events

Audit Trail

Tools

Reports

Access Points

Policies & Access Control

Roles, Aliases, Denylist, Custom blocked URL, Intra VLAN allowlist, Firewall Settings

Roles

Aliases

Edit Network Alias

Name

Description

Private IP Range

ITEMS (3)

Type	IP Address/Domain Name/host Name	Network/Range
Network	10.0.0.0	255.0.0.0
Network	172.16.0.0	255.240.0.0
Network	192.168.0.0	255.255.0.0

2. Create a PBR policy.

MicroBranch

Manage

Overview

Devices

Clients

Guests

Applications

Access Points

Policy-based routing

POLICIES

Names	Rules	Roles
DC-Nets-PBR	2	CL2
ZIA-PBR	2	RL3
default policy	1	

MicroBranch

Manage

Overview

Devices

Clients

Guests

Access Points

Policy-based routing

ZIA-PBR - RULES (2)

Source	Destination	Service / Application	Action
= alias	alias	any	forward
= any	any	any	forward_to_ip_sec_map

The rules are as follows.

First Rule

MicroBranch

Manage

Overview

Devices

Clients

Guests

Applications

Security

Analyze

Alerts & Events

Access Points

Edit Rule

Source Alias

Source Alias RFC1918

Destination Alias

Destination Alias RFC1918

Service/App Any

Action Forward

Second Rule

MicroBranch

Manage

Overview

Devices

Clients

Guests

Applications

Security

Access Points

Edit Rule

Source Any

Destination Any

Service/App Any

Action Forward to IPsec Map

IPsec map name zs-init-zscalardirect-primary-E0-Uplink

3. Associate the PBR policy with a user role.

MicroBranch

Manage

Overview

Devices

Clients

Guests

Applications

Security

Analyze

Alerts & Events

Audit Trail

Tools

Access Points

Policies & Access Control

Roles, Aliases, Denylisting, Custom blocked URL, Intra VLAN allowlist, Firewall Settings

Roles

ROLES (6)

Role

CL2

E0-Uplink

RL3

br-local

default\_wired\_port\_profile

wired-SetMeUp

RULES (2)

Access Rules For Selected Roles

Policy-Based Routing ZIA-PBR

Allow any to all destinations

Summary

List

Config

Alternatively, you could also use NextHop list instead. This is where you add all the IPSEC tunnels to the NextHop list so we can then use it in our PBR. NextHop list makes it easier for cases where you have 2 or more IPSEC tunnels that we can forward traffic. In our case we have 2x IPSEC tunnels for each of the uplinks (eth0 and LTE). You can check my technote on microbranch and Aruba SSE integration, where I use NextHop list.

## 1.6 User Testing

Here we have configured a RL3 SSID which has a default user role of RL3

MicroBranch

Manage

Overview

Devices

Clients

Guests

Applications

Access Points

NETWORKS > CONFIGURATION - RL3

General

VLANs

Security

Access

Summary

Name (SSID):

RL3

Advanced Settings

Summary

List

Config

MicroBranch

Manage

Overview

Devices

Clients

Guests

Applications

Security

Analyze

Alerts & Events

Access Points

Summary

List

Config

NETWORKS > CONFIGURATION - RL3

General

VLANs

Security

Access

Summary

Traffic forwarding mode:

L3 Routed/NATed

Internet

Client VLAN Assignment:

Static

Dynamic

Native VLAN

VLAN ID

Branch-RL3 (vlan:44)

To add/edit DHCP scope profile

Show Named VLANs

MicroBranch

Manage

Overview

Devices

Clients

Guests

Applications

Security

Analyze

Alerts & Events

Audit Trail

Tools

Reports

Maintain

Access Points

Summary

List

Config

NETWORKS > CONFIGURATION - RL3

General

VLANs

Security

Access

Summary

Security Level:

Enterprise

Personal

Visitors

Open

Key Management:

WPA2-Personal

Passphrase Format:

8-63 chars

Passphrase:

\*\*\*\*\*

Retype:

\*\*\*\*\*

MicroBranch

Manage

Overview

Devices

Clients

Guests

Applications

Security

Analyze

Alerts & Events

Access Points

Summary

List

Config

NETWORKS > CONFIGURATION - RL3

General

VLANs

Security

Access

Summary

Access rules

Role Based

Network Based

Unrestricted

ACCESS RULES FOR SELECTED ROLES

Policy-Based Routing ZIA-PBR

Allow any to all destinations

We will start testing by connecting to RL3 SSID.

MicroBranch

Manage

Overview

Devices

Clients

Guests

Applications

clients

3 hours

List

Summary

CLIENTS

ALL

1.34 MB ( 461.76 KB | 910.95 KB )

All

Connecting

Connected

Failed

Offline

Blocked

Wireless

Wired

Remote

CLIENTS

Client Name

Status

IP Address

VLAN

Connected To

SSID/Port

AP Role

Gateway Role

DESKTOP-FCNA7N6

Connected

10.44.44.20

44

MicroBranch2

RL3

RL3

NA

And browse the Internet to generate some traffic to match with our PBR rules. Next, we'll check the sessions table.

←

DESKTOP-FCNA7N6

Summary

AI Insights

Location

Sessions

Profile

Manage

SESSIONS

ACCESS POINT

Total sessions: 576

Last refreshed: 8:48:39 PM

Overview

Applications

Security

Analyze

Live Events

Events

Tools

IP Address | 10.44.44.20 (576)

Appli...	Source...	Desti...	Proto...	Source...	Dest ...	Action	Flags	Pack...	St...
> Domain Name ...	10.44.44.20	1.1.1.1	UDP	53855	53	Permit	R I F C A	1	Active
> Domain Name ...	10.44.44.20	1.0.0.1	UDP	54845	53	Permit	R I F C A	1	Active
> Domain Name ...	10.44.44.20	1.0.0.1	UDP	54837	53	Permit	R I F C A	1	Active
> Domain Name ...	1.1.1.1	10.44.44.20	UDP	53	60875	Permit	I F A	1	Active
> Brightcove	10.44.44.20	104.119.101.35	TCP	58552	443	Permit	R C	14	Active
> Brightcove	10.44.44.20	104.119.101.35	TCP	58553	443	Permit	R C	9	Active
> Domain Name ...	10.44.44.20	1.0.0.1	UDP	54997	53	Permit	R I F C A	1	Active
> Domain Name ...	10.44.44.20	1.1.1.1	UDP	53954	53	Permit	R I F C A	1	Active
> Domain Name ...	1.1.1.1	10.44.44.20	UDP	53	60831	Permit	I F A	1	Active
> Domain Name ...	1.1.1.1	10.44.44.20	UDP	53	60772	Permit	I F A	1	Active
> Domain Name ...	10.44.44.20	1.1.1.1	UDP	54021	53	Permit	R I F C A	1	Active
> Domain Name ...	10.44.44.20	1.1.1.1	UDP	54267	53	Permit	R I F C A	1	Active
> Domain Name ...	1.1.1.1	10.44.44.20	UDP	53	60722	Permit	I F A	1	Active
> Domain Name ...	10.44.44.20	1.1.1.1	UDP	54215	53	Permit	R I F C A	1	Active

DESKTOP-FCNA7N6

Summary
AI Insights
Location
Sessions
Profile

Manage

SESSIONS

ACCESS POINT

Total sessions: 576

Last refreshed: 8:48:39 PM

Overview

Applications

Security

Analyze

Live Events

Events

Tools

IP Address | 10.44.44.20 (576)

Appli...	Sour...	Desti...	Proto...	Sour...	Dest ...	Action	Flags	Pack...	St...
> Domain Name ...	10.44.44.20	1.1.1.1	UDP	53855	53	Permit	D = Dory R = Redirect V = VOIP I = Deep Packet Inspect S = Source NAT N = Destination NAT F = Fast age Y = No SYN H = High priority T = Set TOS P = Set priority C = Client U = Locally destined M = Mirror G = Media Signal E = Media Deep Inspect a = RTP Analysis A = Application Firewall Inspect B = Permanent L = ALG Session O = OpenFlow w = Waiting for Classification	1	Active
> Domain Name ...	10.44.44.20	1.0.0.1	UDP	54845	53	Permit		1	Active
> Domain Name ...	10.44.44.20	1.0.0.1	UDP	54837	53	Permit		1	Active
> Domain Name ...	1.1.1.1	10.44.44.20	UDP	53	60875	Permit		1	Active
> Brightcove	10.44.44.20	104.119.101.35	TCP	58552	443	Permit		14	Active
> Brightcove	10.44.44.20	104.119.101.35	TCP	58553	443	Permit		9	Active
> Domain Name ...	10.44.44.20	1.0.0.1	UDP	54997	53	Permit		1	Active
> Domain Name ...	10.44.44.20	1.1.1.1	UDP	53954	53	Permit		1	Active
> Domain Name ...	1.1.1.1	10.44.44.20	UDP	53	60831	Permit		1	Active
> Domain Name ...	1.1.1.1	10.44.44.20	UDP	53	60772	Permit		1	Active
> Domain Name ...	10.44.44.20	1.1.1.1	UDP	54021	53	Permit		1	Active
> Domain Name ...	10.44.44.20	1.1.1.1	UDP	54267	53	Permit		1	Active

Note that normally when you browse to ip.zscaler.com, from anywhere else you get this message that shows the request did not come from the Zscaler IP.



[Connection Quality](#) [Zscaler Analyzer](#) [Cloud Health](#) [Security Research](#)

---

The request received from you didn't come from a Zscaler IP therefore you are not going through the Zscaler proxy service.

Your request is arriving at this server from the IP address 203.214.83.128

Your Gateway IP Address is most likely 203.214.83.128