

## 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

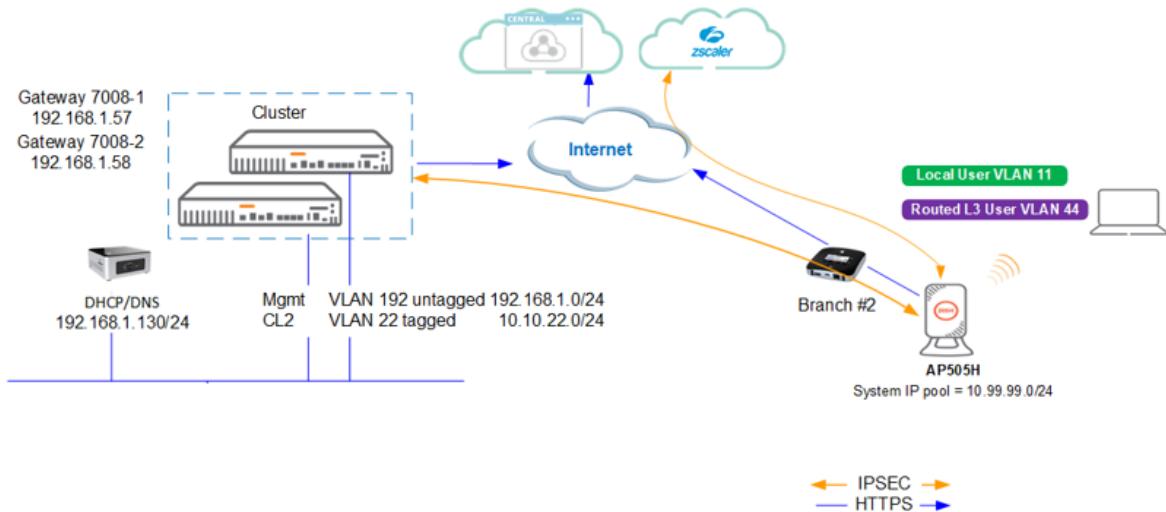
## Revision History

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.

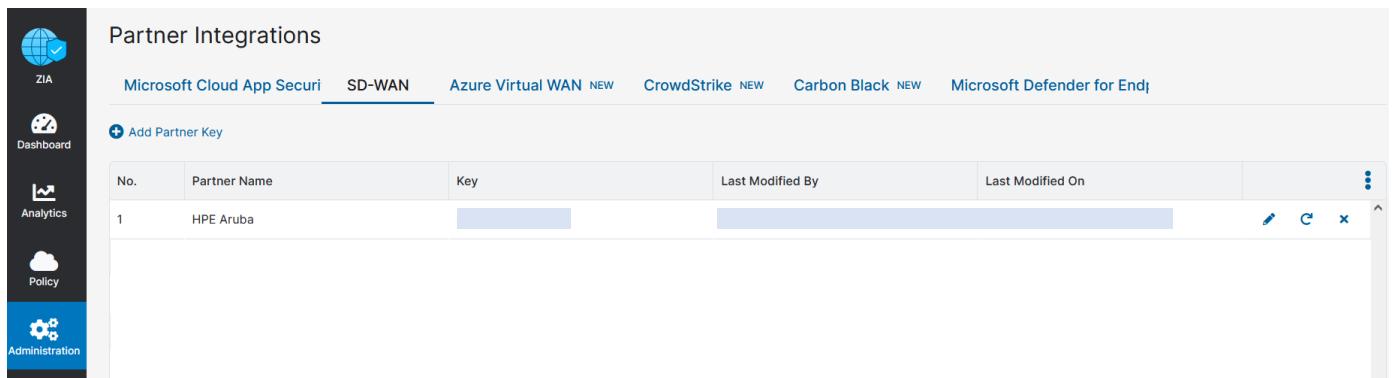
## 1.2 Zscaler Configuration

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.

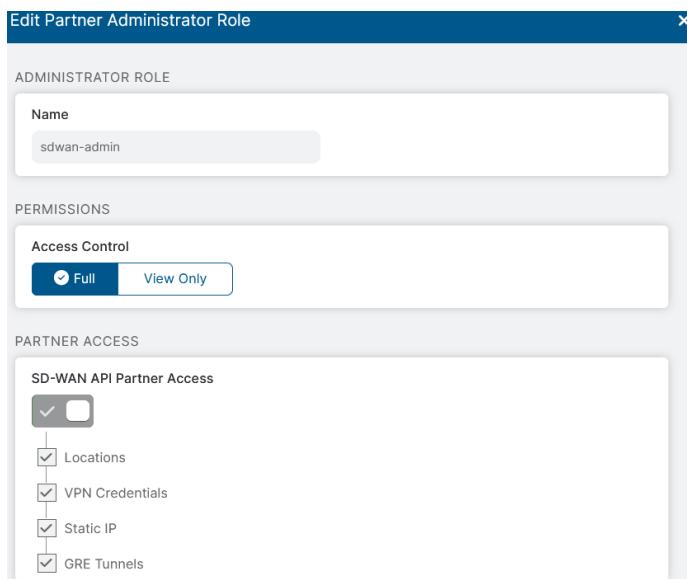
No.	Partner Name	Key	Last Modified By	Last Modified On

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



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.



ADMINISTRATOR ROLE

Name: sdwan-admin

PERMISSIONS

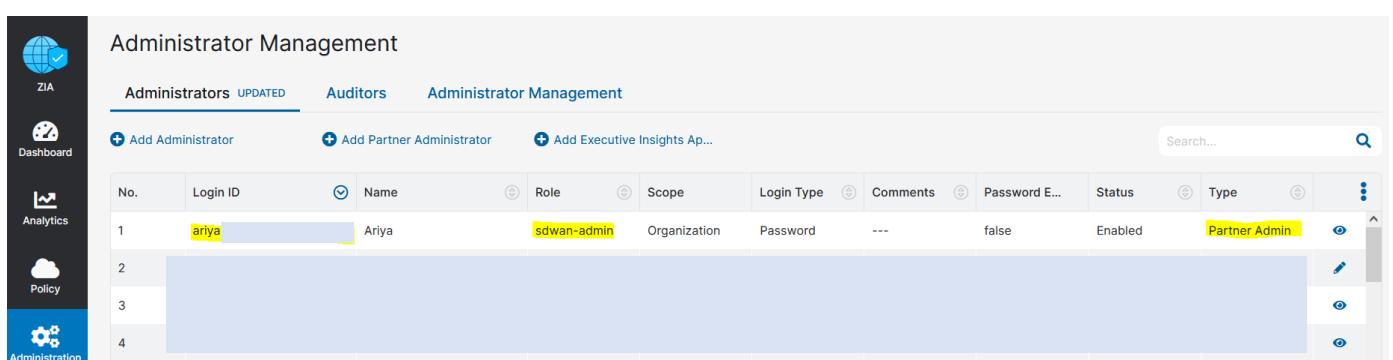
Access Control:  Full  View Only

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.



No.	Login ID	Name	Role	Scope	Login Type	Comments	Password E...	Status	Type
1	ariya	Ariya	sdwan-admin	Organization	Password	---	false	Enabled	Partner Admin

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

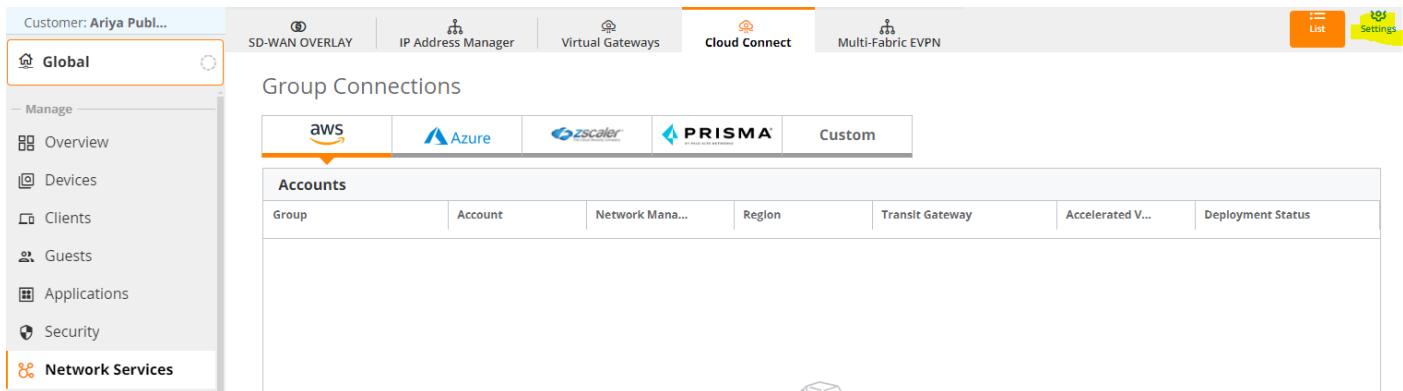
There are a few things you need to note before starting.

- 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.

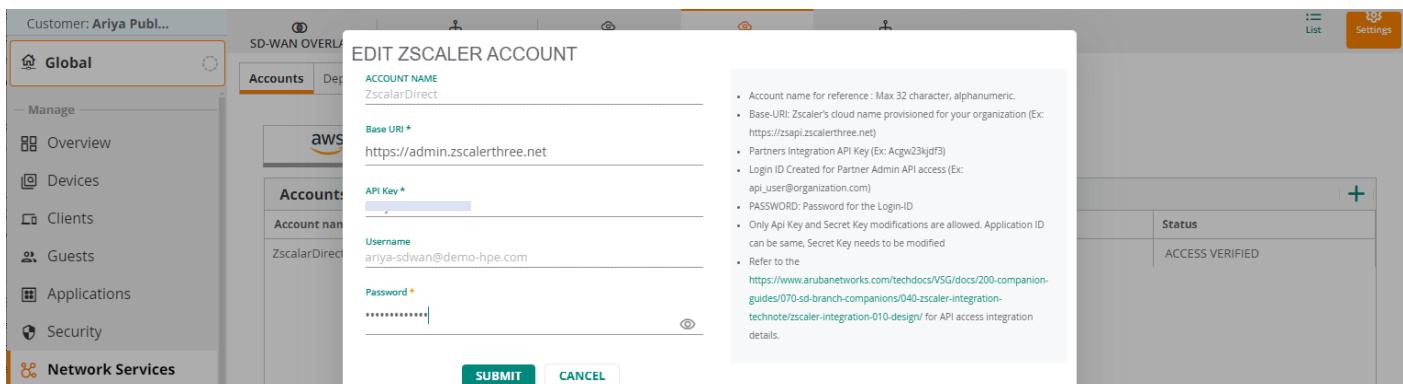
The main tasks are

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.

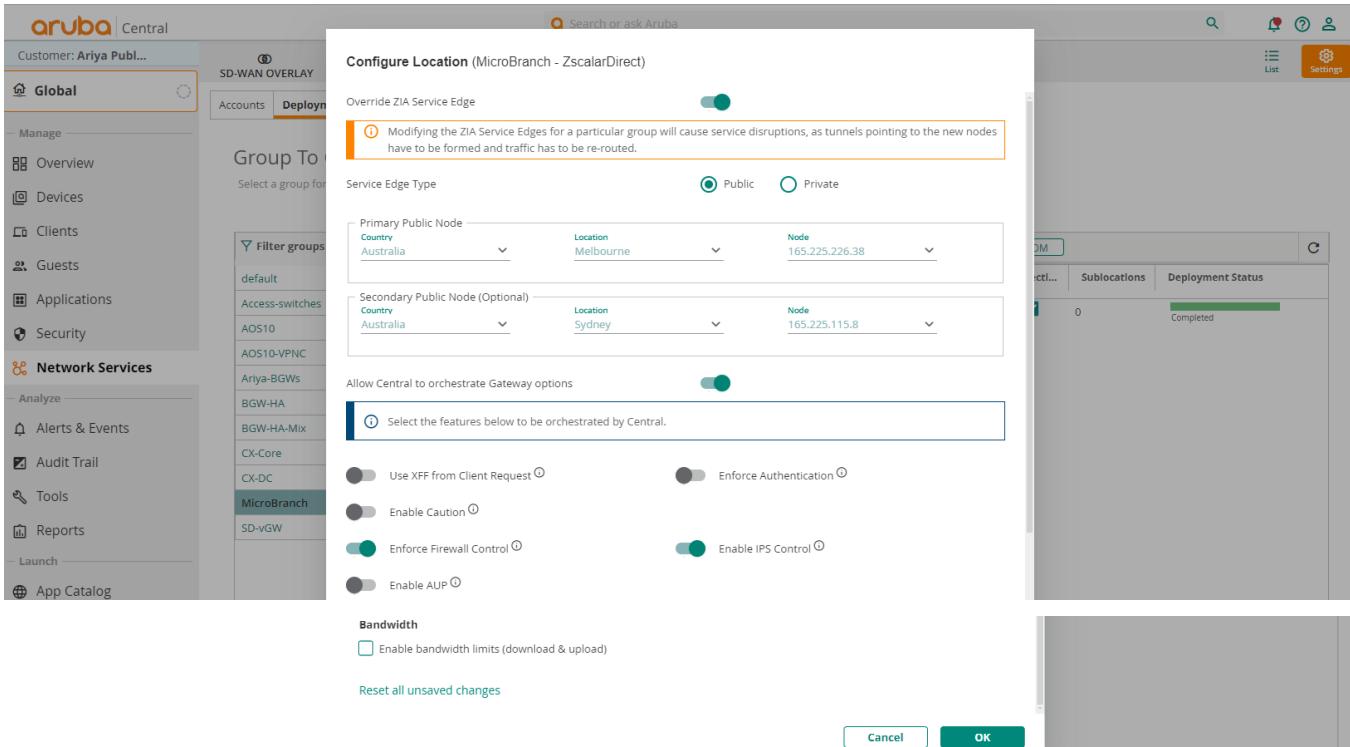
The screenshot shows the Cloud Connect section of a network management interface. The 'Cloud Connect' tab is selected. On the left, a sidebar lists 'Global' and 'Network Services' under 'Manage'. The main area shows an 'Accounts' table with one entry: 'ZscalarDirect' (Account name), 'https://admin.zscalerthree.net' (Base URI), 'ariya' (Username), and a redacted API Key. The 'Status' column shows 'INIT'.

This might take few minutes, be patient.

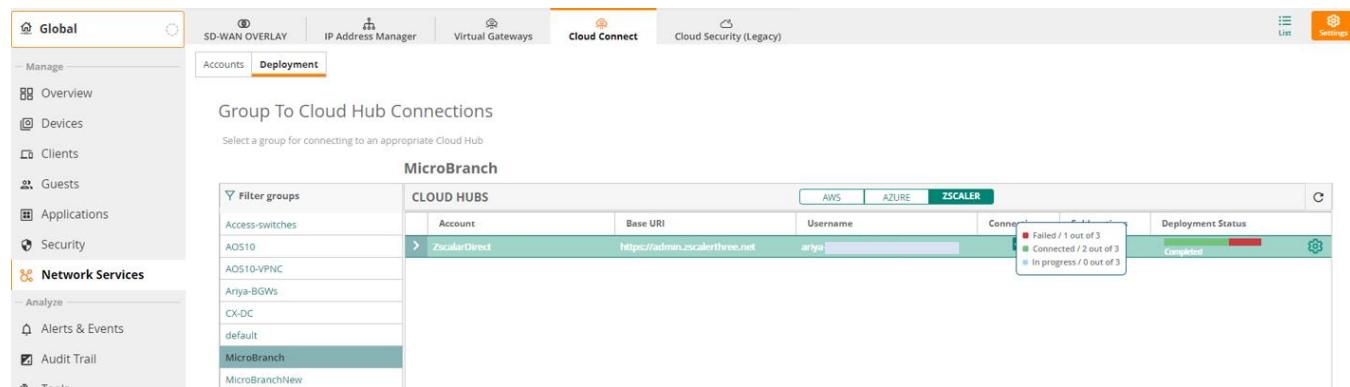
The screenshot shows the Cloud Connect section of a network management interface. The 'Cloud Connect' tab is selected. The 'Deployment' tab is highlighted in the navigation bar. The main area shows an 'Accounts' table with one entry: 'ZscalarDirect' (Account name), 'https://admin.zscalerthree.net' (Base URI), 'ariya' (Username), and a redacted API Key. The 'Status' column shows '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.

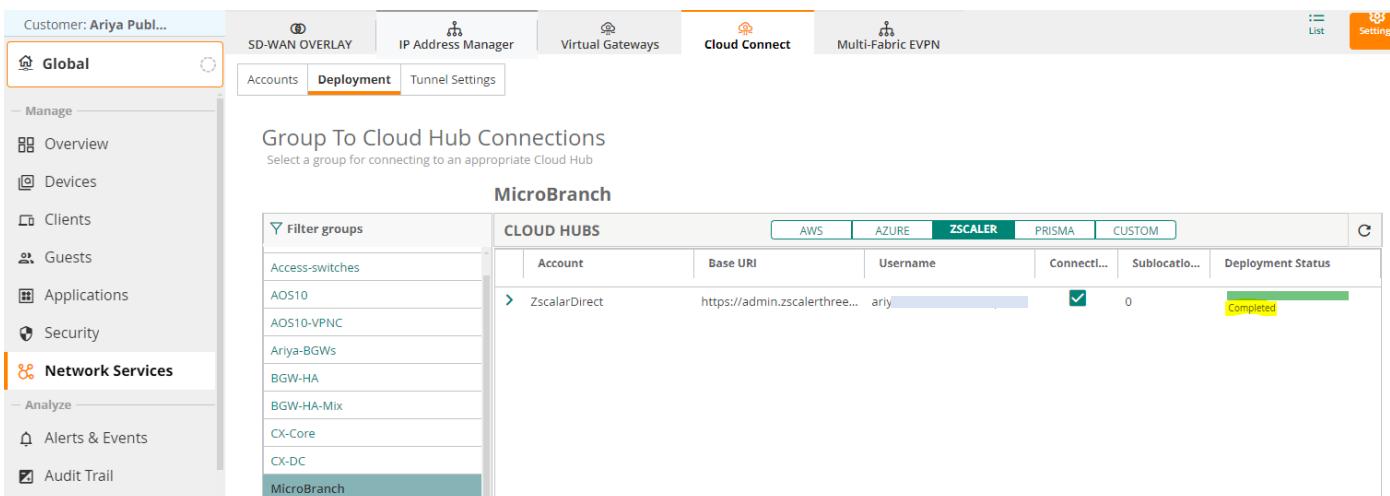
The screenshot shows the 'Deployment' tab of the Cloud Connect section. The main area displays a table titled 'Group To Cloud Hub Connections' with the heading 'MicroBranchNew'. The table lists 'CLOUD HUBS' with columns for 'Account', 'Base URI', 'Username', 'Connecti...', 'Sublocatio...', and 'Deployment Status'. A row for 'ZscalarDirect' is selected, showing 'ariya' in the 'Username' field and a green checkmark in the 'Deployment Status' field. The 'Deployment Status' column for the row is also green. The 'Deployment' tab is highlighted in the navigation bar.



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-zscalardirect-primary-lte-uplink  165.225.226.38  0          0          0
zs-init-zscalardirect-primary-e0-uplink    165.225.226.38  230        0          230
zs-init-zscalardirect-secondary-e0-uplink  165.225.115.8   229        0          229
zs-init-zscalardirect-secondary-lte-uplink 165.225.115.8   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 13d 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-blab-0612c0de2a69
276a6d41-b41c-4676-8bd2-f3e2cbc2036e  zs-init-zscalardirect-primary-e0-uplink  0x50003 Up    119768694
```

```
zs-init-zscalardirect-secondary-e0-uplink 0x50004 Up 119768695
6d4017ef-94c1-4aaaf-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-zscalardirect-primary-e0-uplink 165.225.226.38 tun1 18750/36423
1714608/37751975 0/0 0/0
zs-init-zscalardirect-secondary-e0-uplink 165.225.115.8 tun2 0/0 0/0
0/0 0/0
zs-init-zscalardirect-secondary-lte-uplink 165.225.115.8 0/0 0/0
0/0 0/0
zs-init-zscalardirect-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/Missed/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 N/A
1970-01-01 11:00:00
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-964dd27ffffef 165.225.226.38 SM_STATE_INIT
LTE-Uplink -4993 IPSEC NULL 0/0/0/0 N/A
1970-01-01 11:00:00
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 Addre...	Descri...	Proxy ...	Use XF...	Auth...	Fire...	Band...	Virtu...	IPS C...	Group	Man...	Loca...	Actions
1														
2														
3														
4	MicroBranch1...	---	---	---	---	Enabled	---	---	Enabled	Unassign...	HPE Aru...	Corpora...	---	
5	MicroBranch2...	---	---	---	---	Enabled	---	---	Enabled	Unassign...	HPE Aru...	Corpora...	---	

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

MicroBranch1

Site Health Summary Wi-Fi Connectivity WAN Health AI Insights Topology Floor Plan

Overlays VLANs Show Device Names

MicroBranch1

Zscaler(...lbourne) Zscaler(...-Sydney) Aruba7008\_VPNC1

Aruba-29...2G-2SFPP

MicroBranch1

MicroBranch2

Site Health Summary Wi-Fi Connectivity WAN Health AI Insights Topology Floor Plan

Overlays VLANs Show Device Names

MicroBranch2

Zscaler(...lbourne) Zscaler(...-Sydney) Aruba7008\_VPNC1

Aruba-29...2G-2SFPP

MicroBranch2

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

MicroBranch1

Online since 11 Hours 38 Minutes 46 Seconds

Device Health Good

Radio Health 2 0 0 0

Tunnels 3 0 2

Virtual Controller

RF Routing

Actions Go Live

1 month

NETWORK			
ETH0	SPEED (Mbps) / DUPLEX	VLAN	LLDP Details
Up	1000 / Full	Access (0)	
ETH1	---	-	
ETH2	---	-	

VPNC TUNNELS SUMMARY

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.

**Aliases**

**Edit Network Alias**

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.

**POLICIES**

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

**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**

**Edit Rule**

Source Alias: RFC1918

Destination Alias: RFC1918

Service/App: Any

Action: Forward

**Second Rule**

**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.

**Access Points**

**Policies & Access Control**

**Roles**

Role
CL2
EO-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

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

**Access Points**

**NETWORKS > CONFIGURATION - RL3**

General VLANs Security Access Summary

Name (SSID): RL3

> Advanced Settings

MicroBranch Access Points Networks > Configuration - RL3

General VLANs Security Access Summary

Traffic forwarding mode: L3 Routed/NATed

Client VLAN Assignment: Static

VLAN ID: Branch-RL3 (vlan:44)

Security Level: Enterprise

Key Management: WPA2-Personal

Passphrase Format: 8-63 chars

Passphrase:

Retype:

MicroBranch Access Points Networks > Configuration - RL3

General VLANs Security Access Summary

Security Level: Enterprise

Key Management: WPA2-Personal

Passphrase Format: 8-63 chars

Passphrase:

Retype:

MicroBranch Access Points Networks > Configuration - RL3

General VLANs Security Access Summary

Access rules: Role Based

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 Clients

CLIENTS ALL 1

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

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...	Sourc...	Desti...	Proto...	Sourc...	Dest ...	Action	Flags	Pack...	St...
Domain Name ...	10.44.44.20	1.1.1.1	UDP	53855	53	Permit	RIFCA	1	Active
Domain Name ...	10.44.44.20	1.0.0.1	UDP	54845	53	Permit	RIFCA	1	Active
Domain Name ...	10.44.44.20	1.0.0.1	UDP	54837	53	Permit	RIFCA	1	Active
Domain Name ...	1.1.1.1	10.44.44.20	UDP	53	60875	Permit	IFA	1	Active
Brightcove	10.44.44.20	104.119.101.35	TCP	58552	443	Permit	RC	14	Active
Brightcove	10.44.44.20	104.119.101.35	TCP	58553	443	Permit	RC	9	Active
Domain Name ...	10.44.44.20	1.0.0.1	UDP	54997	53	Permit	RIFCA	1	Active
Domain Name ...	10.44.44.20	1.1.1.1	UDP	53954	53	Permit	RIFCA	1	Active
Domain Name ...	1.1.1.1	10.44.44.20	UDP	53	60831	Permit	IFA	1	Active
Domain Name ...	1.1.1.1	10.44.44.20	UDP	53	60772	Permit	IFA	1	Active
Domain Name ...	10.44.44.20	1.1.1.1	UDP	54021	53	Permit	RIFCA	1	Active
Domain Name ...	10.44.44.20	1.1.1.1	UDP	54267	53	Permit	RIFCA	1	Active
Domain Name ...	1.1.1.1	10.44.44.20	UDP	53	60722	Permit	IFA	1	Active
Domain Name ...	10.44.44.20	1.1.1.1	UDP	54215	53	Permit	RIFCA	1	Active

Look for the R flag which indicates redirection.

DESKTOP-FCNA7N6

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...	Sourc...	Desti...	Proto...	Sourc...	Dest ...	Action	Flags	Pack...	St...
Domain Name ...	10.44.44.20	1.1.1.1	UDP	53855	53	Permit	D = Deny 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

Finally from the client laptop you can browse to ip.zscaler.com and get the following information that shows the traffic is going through ZIA service.

https://ip.zscaler.com

**zscaler** Connection Quality Zscaler Analyzer Cloud Health Security Research

You are accessing the Internet via Zscaler Cloud: Melbourne II in the zscalerthree.net cloud.

Your request is arriving at this server from the IP address 165.225.226.224  
The Zscaler proxy virtual IP is 165.225.226.36  
The Zscaler hostname for this proxy appears to be zsc3-me12-1b2-sme

aruba

Sorry, we couldn't load the page.

Invalid Request: Authentication is disabled for your location  
Error Code: 211000

Need help? Contact our support team at +91-9000000000, support@11365593.zscalerthree.net

009

zscaler Your organization has selected Zscaler to protect you from internet threats.

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.

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