WAN Assurance in Action Full Stack SE-AIDE-024

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Driven By Experience

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Topology



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WAN Design

Concepts and Methodology



Wan edge Definitions

<u>Hub Profiles:</u> A Hub profile automates the Overlay definition with a path per Hub WAN link

Networks:

Define the subnet. Create LAN segments. Define NAT rules and Users (source addresses to be used in policies)

<u>Applications:</u> Define applications based on addresses, apps, app categories or hostnames.

WAN Edge Template Type: Standalone or Spoke

- Create WAN Interface(s)
- Select overlay path on WAN interface(s)
- Define/Select LAN Network(s)
- Specify the traffic steering preferences
- Define User intent-based Service Policies
- Define Routing policies Static, BGP, OSPF

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Wan edge Definitions: Overlay and paths

An Overlay is the connectivity between the Hub(s) and Spoke(s).

- Adding/removing WAN links in Hub Profiles add/remove paths on the overlay.
- Paths are added to WAN interfaces within a Spoke.
- The Mist CA generates/transfers the certificates used to authenticate the IPSec tunnel(s) created between the Hub(s) and Spoke(s).
- A WAN link probe is created to detect WAN outages. This steers traffic to other WAN links automatically and can be customized in API.



WAN Edge UI navigation

Mist	CORP01					
♂ Monitor	WAN Edge	Templates				
⊞ Marvis™	Filter	Q,				
O) Clients	6 Templates					
_	TEMPLATE			☆ TYPE		SITES
 Access Points 	cluster-spokes-dhcp			Spoke		1
	dc1					0
	Admin	Access	WAN	Wired	Wireless	0
+ WAN Edges	Administrators	Auth Policies	Applications	Campus Fabric	AP Port Templates	6
	Audit Logs	Auth Policy Labels	Application Policy	Switch Templates	Device Profiles	0
Х сыкз	Client Onboarding	Certificates	Hub Profiles BETA		Labels	0
✓ Location	Inventory	ldentity Providers	Network Topology		Mist Edges	
nalytics	Mobile SDK		Networks		Mist Tunnels	
	Settings		WAN Edge Templates		Pre-shared Keys	
Gite Site	Site Configuration		· · ·		RF Templates	
Organization	Subscriptions				WLAN Templates	

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STEP 1: Site Creation and site-specific variables

Mišt	CORPO1			Edit Variables		×
sonitor tarvis ^w ccess Points witches RAN Edge ecation nalytics tetwork rganization	< Site Configuration : dC1	Location reals and the region Series address or standing, longitude The address or standing, longitude The address or standing, longitude the address of the	Mist Tunnels Under Store Present AP Selects 7 Upstream Resource Monitoring Distance & Distance WAN Edge Application Visibility Are provided a valid to optication Visibility Are provided a valid to optication Visibility Are provided a valid to optication Visibility	Matter Variable f(dns_1)} {(dns_1)} Value 1.1.1.1 anton optimized ude 22.03635 2.03635	Delete Save Cancel	ty r monitoring applications a ck license
	RF Template No RF template	Street Address Sunnyvale; CA, USA Latitude Longitude 37,36883 -122.03635	Log Source Interface	109°	Site Variables	Add Variab
			Site Variables	Add Variabk	Variables	Values
	Site Groups	Engagement Analytics	Variables	Values		
	Site Groups +	Engagement Analytics Enable Dwell Time Categories (value in seconds between 0 and 24 hours)	Variables i) {{dc_corp_net}} {{dc_corp_subnet}}	Values 10.0.0 24	{{dc_corp_net}}	10.0.0.0
	Site Groups	Engagement Analytics Denable DevelTime Categories (value in seconds between 0 and 24 hour Categories Min dwell Max dwell Passerby 1 300	variables {(dc_corp_net)} {(dc_corp_submet)} {(drs_1)} {(drs_2)}	wars 100.00 24 1.1.1.1 8.8.8 8.8.8	{{dc_corp_net}} {{dc_corp_subnet}}	10.0.0.0
	Site Groups + AP Firmware Uggrade Firmware Uggrade Uggrade Uggrade Uggrade Uggrade	Engagement Analytics basis DealTime Categories (solar is seconds batween 0 and 24 hour Categories Main deell Accessory 1 500 Cuttomer 301 14400 Accessor 14401 24807	Vuriables ((dc_corp_net)) ((dc_corp_subnet)) ((dcn_2)) ((dcn_2)) ((dcn_2)) ((dc_corp_ph))	10000 24 11.1.1 tween 0 and 24 hours) 88.8 10001 10001 Max dwell	{{dc_corp_net}}} {{dc_corp_subnet}} {{dns_1}}	10.0.0.0 24 1.1.1.1

Site variables provide simplicity and flexibility for deployment at scale

★ Please ensure your device has the application signature package installed. Mist will perform this for you if you enable at the site level (WAN Edge Application Visibility) or on the device.

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STEP 2: Networks

"*Who*" are my users & devices?

• How is my network segmented?

Mist	CORP01								TUE, 03:44 PM 🖉 🖓 🕐
🚱 Monitor	Networks								Add Networks
@ Marvis™	Filter Q								
္လ Clients	5 Networks								
	NAME		VLAN ID	USERS	AI	DVERTISED VIA OVERLAY	STATIC SOURCE NAT	DESTINATION NAT	SOURCE NAT POOL
Access Points	dc1-servers	{{dc_corp_net}}/{{dc_corp_subnet}}	{{vlan_id}}	dc1-web_server	×				
Switches	internet	0.0.0/0		-					
	spoke-corp	{{spoke_corp_net}}/{{spoke_mask}}	{{vlan_id}}	spoke_corp_printer		/			
WAN Edge	spoke-corp-agg	10.10.0/16				1			
R CBRS	spoke-guest	{{spoke_guest_net}}/{{spoke_mask}}	{{vlan_id}}						
🗸 Location									
D Analytics									
G Site									
Organization									





Give your network a name and define the subnet. For SRX use a default VLAN id of 1 if untagged.

Enable "Access to Mist Cloud" to permit services from this network to the Mist cloud. Enable "Advertise via Overlay" to announce this network via iBGP.

Add users/hosts representing the LAN segments – these will be used as source in service policies.

Support for Source and Destination NAT



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STEP 3: Applications

"*What*" are my users connecting to?

- Network services
- SaaS apps
- Private subnets
- Cloud workloads

Mist	CORP01			TUE, 03:47 PM 🖉 🤉 🕐
🕢 Monitor	Applications			Add Applications
🖽 Marvis™	6 Applications			
	NAME	😞 ТҮРЕ	TRAFFIC TYPE	
Clients	any	Custom	default	
• Access Points	dc-srvr-ping	Custom	default	
	guest-web	Custom	default	
Switches	public-dns	Custom	default	
🕁 WAN Edge	spoke-corp-agg	Custom	default	
@ CBRS	spotify	Apps	default	
X				
🗸 Location				
D Analytics				
CO Site				
Organization				

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STEP 3: DEFINE applications

Give your application a name and select Custom Apps and provide the IP/Domain along with protocol or select Apps or App categories and choose from the Mist Application list or Application category list.

Support for all protocols including "any".

Edit Application × Edit Application Name Name spotify Type Type Custom Apps O Apps O App Categories IP Addresses Apps 8.8.8.8/32,8.8.4.4/32,1.1.1.1/32,1.0.0.1/32 Spotify × + ADVANCED SETTINGS Override Settings (comma-separated) Traffic Type Domain Names Default (comma-separated) Protocol Protocol Number 🚯 Start Port End Port 53 UDP V Not Applicable 53 ADVANCED SETTINGS Traffic Type \sim Default Delete Application Cancel Delete Application Save Cancel JUNIPE 12

 \star Advanced Settings not in-scope for Phase 1

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STEP 4: Wan edge Hub Profiles

Hub Profiles are assigned to stand-alone or clustered devices and automate Overlay Path creation. Each WAN link will have a path that can be selected on a Spoke Device/Template.

Mist	CORP01		THU, 09:15 AM	2 Ç	?
Nonitor	Hub Profiles			reate Prof	ile
🕮 Marvis™	Filter Q				
On Clients	2 Hub Profiles				
• Access Points	HUB PROFILE 2	dc1			
Switches	h2				
+ WAN Edges					
R CBRS					
🗸 Location					
₀₀ Analytics					
G Site					
Organization					

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STEP 5: Wan edge templates

This is where the "who", "what", "where", "how" constructs come together.



STEP 5: Wan edge template – DNS/NTP settings

Mist	CORP01		TUE, 12:05 AM 🖉 🌻
↔ Monitor	<pre>spoke: spokes-static</pre>		Delete Template More V Save Cancel
⊞ Marvis™			
O) Clients	INFO	APPLIES TO SITES	
• Access Points	Name spokes-static	6 sites 3 wan edges Assign to Sites	
Switches			
+ WAN Edges	NTP	DNS SETTINGS	
R CBRS	NTP Servers pool.ntp.org	DNS Servers	
🗸 Location		(Comma-separated IPs and Max 3)	
oO Analytics	(Comma-separated IPs/Hostnames)	(Comma-separated Domains and Max 3)	
Site			
Organization	WAN 💙		



STEP 5A: Wan edge template – Wan

Mist	CORP01					TUE, 03:56 PM 🖉 🖓
Honitor	wan 🗸					
⊞ Marvis™	Search	٩,				Add WANs
On Clients	2 WANs		WAN TYPE	IP CONFIGURATION	OVERLAY HUB ENDPOINTS	
• Access Points	wan0	ge-0/0/0	broadband	10.13.0.2/30	p1.dc	
Switches	wan1	ge-0/0/1	broadband	10.13.1.2/30	p2.dc	
🖶 WAN Edge						
✓ Location						
DD Analytics	lan 🗸					
G Site	Search	٩,				Add LANs
Organization	2 LANs	INTERFACE	UNTAGGED	VLAN ID	IP CONFIGURATION	рнср
	spoke-corp	ge-0/0/2	Yes	{{vlan_id}}	{{spoke_corp_ip}}/{{spoke_mask}}	Server
	spoke-guest	ge-0/0/3	Yes	{{vlan_id}}	{{spoke_guest_ip}}/{{spoke_mask}}	Server
	TRAFFIC CTEEDING	· • •				



STEP 5A: Wan edge template- wan detail

Name of the security-zone and interface used for your wan link. Add vlan-id if needed. Interface specific options like LTE APN will be shown where necessary.

Static IP/mask of the hub, along with gateway. Spoke can be DHCP.

Select to enable Source NAT and Override the public IP for the Hub if needed when the Hub does not have the IP needed to terminate Auto-VPN.

The endpoint selected here ties the Hub and Spoke together and creates the Auto-VPN tunnel. Edit WAN Configuration Name WAN Type Ethernet OSL (SRX Only) Interface ge-0/0/0 (ge-0/0/1 or reth0 - commas not supported) VLAN ID IP Address Prefix Length / 30 10.11.0.2 Gateway 10.11.0.1 Source NAT (SRX Only) Override Public IP OVERLAY HUB ENDPOINTS Endpoint ▼ 1 p1.dc Add Overlay Hub Endpoints Delete WAN Cancel JUNIPER

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STEP 5B: Wan edge template – Ian

Mist	CORP01					TUE, 03:56 PM 🖉 🖓 🥐
Honitor	wan 🗸					
🕮 Marvis™	Search	Q				Add WANs
လို Clients	2 WANs		WAN TYPE	IP CONFIGURATION	OVERLAY HUB ENDPOINTS	
• Access Points	wan0	ge-0/0/0	broadband	10.13.0.2/30	p1.dc	
Switches	wan1	ge-0/0/1	broadband	10.13.1.2/30	p2.dc	
WAN Edge						
R CBRS						
🗸 Location 🗖						
□□] Analytics	lan 🗸					
G Site	Search	٩				
	2 LANs					Add LANS
Ciganization	NETWORK Spoke-corp	INTERFACE ge-0/0/2	Ves	VLAN ID IP C {{vlan id}} {{si	onFiguration	DHCP
	spoke-guest	ge-0/0/3	Yes	{(vlan_id}) {{si	poke_guest_ip)/{{spoke_mask}}	Server
	TRAFFIC CTERRING					





STEP 5B: Wan edge template - Ian detail

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STEP 5C: Wan edge template – traffic steering

"*How*" to steer the user traffic?

- Path preference
- Routing , Overlay, Underlay
- SLA
- QoS

Mist	CORP01					TUE, 08:20 PM 🖉 🖓
Monitor	lan 💙					
🕮 Marvis™	Search	Q				Add LANs
Clients	2 LANS	WITEFACE	INTACCED	W AN ID	IN CONFICURATION	
• Access Points	spoke-corp	ge-0/0/2	Yes	{{vlan_id}}	{{spoke_corp_ip}}/{{spoke_mask}}	Server
	spoke-guest	ge-0/0/3	Yes	{{vlan_id}}	{{spoke_guest_ip}}/{{spoke_mask}}	Server
Switches						
WAN Edge						
R CBRS						
✓ Location						
D Analytics	TRAFFIC STEERING 💙					
G Site	Search	a,				Add Traffic Steering
	3 Traffic Steering					The name second
W organization	NAME		STRATEGY		PATHS	
	overlav		ECMP		n1.dc n2.dc	
	underlay		Ordered		wan0, wan1	



STEP 5C: Wan edge template - traffic steering detail

MON, 06:02 PM 🖉 🖓 🕐	Underlay Path	LAN Path	Overlay Path
Add Traffic Steering ×	• Phase 1 supports Ordered only.	Phase 1 supports Ordered only.	Phase 1 supports ECMP only.
Name	Edit Traffic Steering ×	Edit Traffic Steering ×	Edit Traffic Steering
lan	Name	Name	Name
Ordered Weighted	Strategy Ordered Weighted	act-servers Strategy Ordered	Strategy Ordered
СЕСМР		 Weighted ECMP 	Weighted ECMP
PATHS Add Paths	Type	PATHS Add Paths	PATHS Add Paths
Туре	WAN: wan0 WAN: wan1	Type LAN: dc1-servers	vype Overlay: p1.dc Overlay: p2.dc
No Paths defined			
Add Path 🖌 🗡			
Overlay name is required			
Type Overlay			
Overlay			
LAN			

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STEP 5D: Wan edge template – access policy

CORP01 SUN, 03:38 PM 🚊 🔉 🕐 Mist AUU LAINS 1 LAN Nonitor NETWORK INTERFACE VLAN ID IP CONFIGURATION DHCP 🚥 Marvis™ dc1-servers ge-0/0/2 {{dc_corp_ip}}/{{dc_corp_net}} Yes {{vlan id}} Server 🔄 Switches 🕱 CBRS TRAFFIC STEERING 💙 🗸 Location Add Traffic Steering 3 Traffic Steering BO Analytics NAME PATHS dc1-servers Ordered dc1-servers ECMP overlay p1.dc, p2.dc Organization underlay Ordered wan0, wan1 ACCESS POLICIES 💙 \ (SRX Only) Please ensure traffic steering policies are elected, if not, corresponding policies for the networks and applications will not be available on the device for SRX to pass traffic 2 Access Policies Add Policy Edit Applications □ NO. NAME RK / USER (MATCHING ANY) ACTION APPLICATION / DESTINATION (MATCHING ANY) TRAFFIC STEERING 1 internet + dc1-servers × \longrightarrow any × + underlay × □ 2 dc-ping spoke-corp × dc-srvr-ping × 🕂 dc1-servers × ~ Q, Search dc1-servers dc1-web_server.dc1-servers internet spoke-guest **1**

"Who" can access "what" and "how"?



STEP 5D: Wan edge template – access policy detail

Access policy consists of:			
- Name			
 Network/User (source) Selected from the network/users already defined under Network 	ACCESS POLICIES V		
- Action - Permit or Dony	No. NAME 1 internet	NETWORK / USER (MATCHING ANY) ACTION APPLICATION / DESTINATION (MATCHING ANY) + dctservers ×	TRAFFIC STEERING
 Application / Destination Selected from the application(s) already define under Applications 	2 dc-ping	spoke.corp_printer.spoke.corp	dc1-servers × ····
 Traffic Steering Path Select from the Paths already defined for traffic steering. Destination zone is determined by the traffic steering path 	ROUTING ¥		
Note: Traffic steering is mandatory for SRX in Access policy			

STEP 5D: Wan edge template – access policy spoke example

ACCESS POLICIES 💙

5 Access Poli	cies				Add Policy	Edit Applications
□ NO.	NAME	NETWORK / USER (MATCHING ANY)	ACTION	APPLICATION / DESTINATION (MATCHING ANY)	TRAFFIC STEERING	
0 1	local-breakout	+ spoke-corp ×		any 🛛 +	underlay ×	
□ 2	guest-local-breakout	spoke-guest ×	~	guest-web × public-dns × +	underlay ×	
□ 3	corp-spoke-out	spoke-corp-agg.spoke-corp	~	spoke-corp-agg × +	overlay ×	
□ 4	corp-spoke-in	+ spoke-corp-agg ×	~	spoke-corp-agg × +	corp-lan ×	
0 5	corp-overlay	spoke-corp ×	~	any × +	overlay ×	

Policy 1 - addresses local breakout via underla	ıy.
Policy 2 - addresses local breakout via underla tcp/80,tcp/443,udp/53	y for guest allowing only ports
Policy 3&4 - addresses spoke<->spoke traffic ou	t/in using aggregate network attached to overlay.
Policy 5 - addresses Internet breakout via ove	erlay at the Hub .

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STEP 5D: Wan edge template – access policy hub example

ACCESS POLICIES 💙

3 Access Policies			Add Policy Edit Applications
NO. NAME	NETWORK / USER (MATCHING ANY)	ACTION APPLICATION / DESTINATION (MATCHING ANY)	TRAFFIC STEERING
□ 1 local-breakout	+ dc1-servers ×	any 🛛 +	underlay ×
□ 2 dc-ping	+ spoke-corp ×	dcsrvr-ping × +	dc1-servers ×
3 hub-int-breakout	+ spoke-guest ×	\longrightarrow any \times +	underlay ×

Policy 1	- addresses	local brea	kout to interne	et via underlay.
----------	-------------	------------	-----------------	------------------

- Policy 2 addresses connectivity to a server behind the Hub.
- Policy 3 addresses Internet breakout at the Hub here spoke-guest network breaks out to Internet at the hub using Hub underlay.



STEP 5E: Additional cli

For configuration settings that are not natively supported in Mist model use the Additional CLI commands. Additional CLI is available within the template and at the device level. Additional CLIs from the template are merged with the CLIs at the device level.

CLI CONFIGURATION 💙	
CLI CONFIGURATION	KX KX
Additional CLI Commands for SRX set protocols lldp interface all	

STEP 6: Wan edge template – site assignment

Assign the WAN Edge template to site (s)

Assign Te	mplate to Sites			×
2 sites, 1 Select Site Filter	WAN Edges using template dc1 es to assign to template <i>dc1</i>			
				< 1-3 of 3 >
	SITE	WAN EDGE	CONFIGURATION TEMPLATE	*
	Primary Site	0	dc1	
	dc1	1	dc1	
	branch-10	1	spokes-static	
			This will replace existing template in selected sites.	Apply Cancel

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