

Dynamic Network Manager User Guide - Private IP

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Private IP Dynamic Network Manager Overview

Private IP Dynamic Network Manager (DNM) enables you to make changes to your Private IP Ports, Committed Access Rates (CARs), and customer egress profiles.

Features & Benefits

Following are the features and benefits of Private IP Dynamic Network Manager:

- Schedule a Port or CAR change order up to one year in advance
- Make bandwidth changes in minutes through the Verizon Enterprise Center
- Subscribe to electronically delivered activity reports
- Download a site detail report in Microsoft[®] Excel[®]
- Access a Customer Edge (CE) sample configuration
- Issue a specific set of Ping and Show commands on the Provider Edge (PE) Router
- Make real-time application aware network adjustments

Components

Private IP Dynamic Network Manager consists of three components:

- Looking Glass: Allows Users to view the configuration information of their Multiprotocol Label Switching (MPLS) networks. It is a mainly a "view only" interface, but there are Looking Glass orders that allow Users to make certain non-billable Layer 3 configuration changes to their Private IP sites. Looking Glass sample configurations can be downloaded for your CE router. Looking Glass also allows specific PING and Show commands to be issued. Private IP customers can use Looking Glass to see and make settings changes to network service attributes. They can also determine how their sites are configured at the Provider Edge (PE) devices on the network.
- **Dynamic Port (DPORT):** Allows Users to make PIP transport circuit up/down speed changes.
- **Dynamic CAR (DCAR)**: Allows Users to make up/down speed changes to their Expedited Forwarding Committed Access Rate (EF-CAR) speeds including Quality of Service (QOS) egress profiles.

Note: Since DPORT and DCAR enable price impacting changes, they both require specialized Verizon Enterprise Center (VEC) entitlements or permissions. Contact your Account Team for assistance with setting up these permissions.

Business Rules for Private IP Virtual Private Networks (VPNs)

The following business rules apply with Private IP (PIP) Dynamic Network Manager:

- Available to existing and new customers, both customer-managed and those using Verizon Managed Services.
- Available for sites located globally. <u>Note</u>: There are countries where Dynamic Port cannot be supported due to contractual obligations with our partners. Your account team can provide details on availability.
- Available on direct connections
 - For Private IP ports with a W prefix: Dynamic Port is available on direct connections using Time Divisional Multiplexing (TDM) in all regions. Direct Ethernet Access is supported in select countries in Europe.
 - For Private IP ports with a **B** prefix: Dynamic Port is available on both direct connections using TDM access or Ethernet Access in the United States.
 - For Private IP ports with a **C** prefix: Dynamic Port is available on both direct connections using TDM access or Ethernet Access in all regions
- For Private IP ports with a **W** prefix: Dynamic Port requires an initial full port speed of T1, E1, E3, DS3, OC3, STM1, OC12, STM4, and 1 Gigabyte Ethernet (Europe Only)
- For Private IP ports with a **B** prefix: You can order a lower initial Private IP TDM and Ethernet Port speed and then use Dynamic Port to raise or lower the speed to the level you want in the United States.
- For Private IP ports with a **C** prefix: You can order a lower initial Private IP TDM and Ethernet Port speed and use Dynamic Port to raise or lower the speed to the level you want in all regions.
- Some restrictions apply:
 - Dynamic Bandwidth (DCAR and DPORT) is not supported on customer sites using the MPLS VPN Inter-provider Connection (MVIC).
 - DPORT is not available with direct connections using NxT1/NxE1 with MLPPP or MLFR.
 - "DCAR only" (i.e., when not sold with DPORT) is available on the following access types: NxT1 with MLPPP, and MLFR for U.S. sold sites only.
 - Because of contractual agreements, there are countries where Dynamic Port cannot be supported. Contact your Verizon Account Team for more details.
- Below are detailed rules for DPORT changes per day on Private IP ports with a "C" prefix.
 - **Unlimited Speed Change Requests**: you can make more than one speed change request during a 24-hour period. Greenwich Mean Time (GMT) is used as the start/stop reference for a DNM 24 hour time period. DPORT/DCAR speed changes can be made up until (but not after) 11:00 p.m. GMT.
 - Ability to Reverse Speed Change Requests: Within 60 minutes of making a speed upgrade (or downgrade) request, you can "correct" the request (as needed) by reversing the speed change request back to the original speed. After 60 minutes the speed change will be completed from a billing perspective. One speed correction is allowed during a 24-hour period.

- **Billing**: Verizon will continue to bill in 24 hour minimum daily increments. The highest speed change request made during a 24 hour period will be the speed that is passed to billing for that day.
- **Carry Over Speed**: The last speed entered for the day will be the one that gets carried over to the next day and be in effect.

For Your Information:

The Dynamic Network Manager feature does not support Open Shortest Path First (OSPF) or IP Multicasting access at this time. It is important to modify your router configuration for Dynamic CAR and Dynamic PORT in order to keep your router in sync.

If you select Gold CAR (Expedite Forwarding) for Voice over IP calls, a reduction of the CAR value (e.g., 40.456 reduce to 8K) can directly affect the quality of all Voice over IP calls on this link.

Sign In to Verizon Enterprise Center

- 1. Go to http://sso.verizonenterprise.com. The sign in page appears.
- 2. Enter your user name and password and Click Sign In.
- 3. The Verizon Enterprise Center home page appears.

Sign in to business.		Quick tasks	
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Orders by type

Accessing Dynamic Network Manager

Click Dynamic Network Manager on the Verizon Enterprise Center (VEC) home page to go to DNM Dashboard page



Alternative VEC Menu Access to DNM

	Ai	ttention Dynamic Network Manager	r Users <u>View Details</u>	1/3 →
Verizon Manage	e Account Support		다 Portal Updates	Mobile App (Notifications) ~
My Workspace Billing View Invoices View Inquiry Reports Make a Payment Manage Payment Methods Create Inquiry Change Billing Address Update Paperless Billing Make a payment Manage payment methods Setup recurring payments Schedule a payment	Service View Inventory Manage Requests View Alarms My Contract Summary Create Service/Change Request My Price Book Service Management Reporting Submit Move/Add/Change Order Disconnect Services U0197695 USD 52.00 Due date: Dec 0, 20 IN00240448 INR 145769.0 Due date: Dec 5, 20	Orders Create Order View Order Status	Repairs & Troubleshooting Create Repair Ticket View Repair Ticket Original Repairs & Troubleshooting Product Tools Inbound Network Manager Dynamic Network Manager IP Performance Reporting View All	
III Orders	Orders by	type	Action required	

Tip: To avoid having VEC/DNM sessions "time out", you can edit your VEC User Profile to alter the amount of time before sessions will end. See instructions below for making session duration changes.

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Click User Name and then My Profile

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Status	Preferred language	Proactive chat
Active	US English	Disabled
Allow extended session timeout	Time zone	Time format
Yes	GMT	12 Hrs
Date format	Items per page	Preferred contact method
mm-dd-yyyy	10	E-mail
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US	-	
Contact and notification preferences	1	
Direct data billing services	-	

Click Site Preferences Pencil Icon to Edit

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Click Extended Hours to edit/increase VEC session timeout duration

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Choose extended session hours duration and click Update

Dashboard

The DNM Dashboard presents Users with circuits that might require immediate attention. The circuits are arranged by category in horizontal rows. These categories include circuits exhibiting high utilization (thus at risk for packet loss), New Activations, and so on. DNM includes artificial intelligence capability to allow it to learn over time which issues/circuits are of most interest to a User and adjust screen presentation around those preferences.



Select Network to see your Verizon IP Services

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The **Dashboard** displays a menu of your VEC-entitled IP services choices. Choose **Network** to list the circuits in inventory that you have permission to review.

Private IP circuit list after selection under Network Menu

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Alternate Circuit List Views

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Search, Notification Alert, Documentation & Help, Interactive Tour



Verizon Enterprise Center Dynamic Network Manager User Guide

Notification Alerts, Documentation & Help

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Search

Search allows Users to look up circuits by circuit ID, service ID, VPN, or location. You can also display search results by Location for multiple service types i.e. Private IP, Public IP, Secure Cloud Interconnect (SCI) and SDWAN Co Management (Versa). You can refine your search further by accessing the "Filter" menu.

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Export

Export allows a User to export the current screen data to a CSV file.

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View Circuit Details

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bouling Protocol BCP /	rizon / nic Network Manager te IP Sircuit D V0V122780 Inrece ID V0V1725102 W10 1795102 PML LemouAPA APAN N/A.SPN botalis Equipment Sircuit Details Final Time Gar Bitation Alart Threshold Rization Alart Threshold Et PAdress	Port Speed 1535 Rips Resting PE Settings PE Settings Current - 10 Rips O % O % H H 2006.05.3110	Home Network API Reports Home Network API Reports Encapsulation FR Trafic Rule GI Explorment IP 205/155/31/7 Orders Disprositios Extensivitities Extensivitities Extensive Exte	tice too too too too too too too to	Current - Lâ Nites ETM GI Seriad/Qu///21	 \$ 1003 @ goodmant @ Hello, Alexander H I E I E Export I E Export I E Export I E Export
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Note: You can change the **description** for each circuit. Click on the "pencil" symbol near the description. View the pop up. Enter the description that needs to be changed. Click on "save changes."

Utilization Notifications allows Users to select when (and how often) DNM proactively alerts them about circuits reaching bandwidth utilization thresholds. This helps Users avoid packet loss if/when a circuit "runs too hot".

Circuit Change Notifications is another subscription option available to all users who are entitled to see/edit particular circuits; all Users who subscribe to this option are notified of changes made by any of the other Users.

	Preferences for V	WOV32760			^		
	Utilization Notif	lications					
	Alert when or above	80 ×	of utilization				
	E-mail	alexander.harvey	@one.verizon.com				
	Recurrence	● Daily ○ Week	ly ○ Monthly		vices		
	Subscribe						
							back
	Circuit Change I	Notifications					Feed
	Start Date / Time Zone	Pick Date	Africa/Abio	ijan ~	Current - 1.5 Mbps		
	Recurrence Pattern	Daily	Weekly	Monthly			
	Daily Options	Every Weekday			ETN		
	End Date	No End Date	End After	End By	G1		
					Seri		
	Subscribe				1.5 M		
	Cancel				~		. 1000

Network Settings

This section contains both Customer Edge (CE) settings and Provider Edge (PE) settings information. You can view the General Interface Configuration, Virtual Route (VRF) Information, Quality of Service Information, and IPv4 eBGP Routing Information. You can also produce an **example CE design** for your router (for a Customer Managed circuit) from the PIP Looking Glass Site Detail screen.

- 1. Click on the "add symbol" to view the details of the circuit ID
- 2. Click on equipment tab to view the customer edge settings details

Virtual Routing and Forwarding (VRF) allows multiple instances of a routing table to exist within the same router at the same time. Because the routing instances are independent, the same or overlapping IP addresses can be used without conflicting with each other. A VRF may be implemented in a network device by having distinct routing tables, also known as forwarding information bases (FIBs), one per VRF.

				→ Bulk Operations	7
Circuit ID C0108468 Service ID 146124672 PVC 5820282 VPN ACME-Fabrication VRF Name V795957;ACMEFabricat n VPN Address 180 ALLEN RD ATLANTA, GA	Port Speed 8 Mbps Realtime CAR 256 Kbps	Encapsulation ETHERNET Traffic Rule R2 Equipment IP 68.139.174.86	Service Type Not Managed Description Description for C0108468 Entitlements CC CC 10	View Details Preferences Utilization Notifications Change Notifications Activation Status Active	Open
Details Network Settings General Interface Configuration	Orders Diagnostics U	tilization Virtual Services	Cloud Services Other VRF		
Router Type	ASR9K	IPv4 Addres	s / Prefix	68.139.174.85 / 30	
Access Type	ETH10Gig	IPv4 MTU			
Access Type					
Interface Name	TenGigE0/7/0/3.427	Shape Adjus	stment for Ethernet	85%	_

Verizon Enterprise Center Dynamic Network Manager User Guide

Virtual Route Forwarding (VRF)			
VRF Name	V795957:ACMEFabrication	WAN Analysis Reporting	No
Тороюду	HUB	MAX Paths	0
Max Routes	1250	Max Paths Routes Load Sharing	No
Quality of Services			
PIP Class of Service	Enhanced Traffic Management	EF Real Time (Gold) CAR	256 Kbps
Port Speed	8 Mbps	Egress Profile	R2-Voice/video centric #1
Policed on Router	YES	MVRF Multicasting Enabled	No
Peak Speed	0 Kbps	Multicasting RP Address	
Queuing Level	Default	Multicasting MDT Address	
FRF 12 Fragmentation	Disabled		

Multihop IP		Hops Away	
Redistribute Static	Yes	Redistribute Connected	Yes
AS Override	No	Send Community	Yes
		Remote AS	1
IPv6 eBGP Routing Information			
Redistribute Static	Yes	Hops Away	0
AS Override	Yes	Redistribute Connected	No
		Remote AS	0

Customer	Edge	Settings
----------	------	----------

IPv4 Address / Prefix	68.139.174.86 / 30	Layer 2 Encapsulation	ETHERNET VLAN : 3
Server Level	Not Managed		
Layer 1/2 Information			
CONNECTOR TYPE	RJ45	CE WAN Interface / Handoff Type	100BASE-TX INTERFACE 100M
VLAN set to	3		
Services(s) Ordered			
Service Order	193608690.0	Work Order	23455498.0
Managed Service	Not Managed		

Dynamic Network Manager User Guide

Demarcation Information						
1249583C	Site Type CUST	Address 180 ALLEN RD ATLANTA GA 30328-4862 USA	LD1: APT LV1: 1	LD2: BSMT LV2: 2	LD3: BAY LV3: 3	
Sample Router Configuration						_
Notice: The router configuration s own risk!if you are not sure about	shown below is intended as an examp the proper use of a command please	le only. You will likely need to add,rer a seek appropriate advice.	nove or change certain elem	ents of this configuration to meet y	you specific requirements. Use at your	
<pre>!Sample interface config interface FastEthernet0/0 for description Verizon MPLS VPN ip address 68.139.174.86 255.</pre>	guration WITHOUT VLAN tagging ena GigabitEthernet0/0 : ACME-Fabrication; Site-Circuit: 255.255.252	bled atlanta-ga_c0108468-146124672-	5820282			*
no shutdown speed 100 lor speed 1000 for full-duplex	GigE	.a				•

STD QoS DPORT, and ETM to STD*

The CE configuration steps are explicit to Cisco switch stages (for customer managed circuits). For other vendor CE, consult the client manual with respect to changing the interface bandwidth speed. We recommend setting up an egress traffic forming rate on your CE router's WAN interface as per your changes in QOS settings. Follow these guidelines to set up your router for Dynamic Port changes.

ETM QoS DPORT, DCAR, Custom Egress, STD to ETM*

The configuration steps are also explicit to Cisco switch stages (for customer managed circuits). For other merchant CPE, consult the client manual with respect to changing the lining parameters. CBWFQ is typical for Silver CAR and LLQ/Priority Queuing is typical for Gold CAR. We prescribe setting up a settled QOS arrangement on your CE switch's WAN interface as per your changed QOS settings. The external (or parent) strategy should shape all traffic as per your selected DPORT speed. The internal (or kid) strategy ought to contain data transfer capacity assignments as indicated by your selected DCAR speed and Custom Egress profile. Adhere to these directions to set up your switch for Dynamic CAR changes.

* For more technical details, refer to **Customer Edge Configuration Settings** section in **Appendix**

Order History

DNM coordinates all order updates going to downstream IT systems. Every hour it picks up new orders that have been provisioned and processes them. It then picks up any rejected orders waiting for a retry and computes a time when the next retry should occur: once every 24 hours through the sixth retry, then once every 72 hours. After a certain number of retries, DNM stops retrying and sends an email informing a User the update could not be completed. Each order is processed in its own transaction to avoid timeouts when there are a lot of orders in the back log. Retries are processed via the regular work flow. The outcome is reflected in the order history so the original error message, as well as the latest error message can be viewed.

Circuit ID W0V32760 Service ID PVC 1795192 VPN LemonAPA JAPAN N/A JPN)	Port Speed 1536 Kbps Realtime CAR 112 Kbps		Encapss FR Traffic F G1 Equipm 206.155	ulation tule ent IP 131.17		Service Type Not Managed Description / Entitlements CC CP 200		Actions Preferences / Utilization Notification Change Notification Activation Status Not Available	~ ions Is	0 🛛 –
Details Orders ()	Equipment	PE Settings	s Order	5	Diagnostics	Utilization	Hosted S	Services Cloud	Services	Other VRF Search	
Order Number	CircuitId	Status	Requested Date	Expected Date	Billingld	Order Type	Port Speed	User Id	Status Date	Change Type	
2944149	W0V32760	COMPLETED	2019/09/23 04:30: 05 GMT	2019/09/23 04:30: 05 GMT	00209854	DBW	1536 Kbps	manikanta.segu@o ne.verizon.com	2019/09/23 04:30: 05 GMT		+
2937065	W0V32760	COMPLETED	2019/09/09 04:30: 05 GMT	2019/09/09 04:30: 05 GMT	00209854	DBW	1024 Kbps	anil.kumar.pabbiset ty@one.verizon.co m	2019/09/09 04:30: 05 GMT		+
2924719	W0V32760	COMPLETED	2019/08/11 03:30:0 7 GMT	2019/08/11 03:30:0 7 GMT	00209854	DBW	1536 Kbps	anil.kumar.pabbiset ty@one.verizon.co m	2019/08/11 03:30:0 7 GMT		+
2917444	W0V32760	COMPLETED	2019/07/29 06:30: 05 GMT	2019/07/29 06:30: 05 GMT	00209854	DBW	1024 Kbps	anil.kumar.pabbiset ty@one.verizon.co m	2019/07/29 06:30: 05 GMT		+
2907036	W0V32760	COMPLETED	2019/07/20 17:30: 03 GMT	2019/07/20 17:30: 03 GMT	00209854	DBW	1536 Kbps	anil.kumar.pabbiset ty@one.verizon.co m	2019/07/20 17:30: 03 GMT		+
									•		% 100%

DNM Order Summary

This report allows Users to see multiple circuit change activity versus single circuit events (shown in Order History). You can tailor the report to show a defined range of time and frequency of change orders. Results can be exported to PDF and Excel.

Name Home Network API Reports Sarch	Inderest Manager Meme Network API Reports Sci	Name None Network API Reports None Network API None Network None Network Note Network </th <th>Name Neme Neme Neme Apr Reports Sand</th> <th>erizon[/]</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>Feedback 🗘 🧿 🛈 🙁 Hello,</th> <th>Verizon DNM</th>	Name Neme Neme Neme Apr Reports Sand	erizon [/]							Feedback 🗘 🧿 🛈 🙁 Hello,	Verizon DNM
Prior Prior P Polici P SCI Einenet Macellaneous Did Oder Summary Vier AI SCI Consumption Vier AI Port Analabitity Auto Activation Report	Pindel Padel SC Eternet Mediational Di Oder dammary Nord SC Consurption Nord Par Auduktify Automore Report	Pinter Pinter Pinter Pinter Pinter Pinter Pinter	Note P Note A Sid Consurption Sid Consurption Note Name	amic Network Manager			Home Net	work AP	Reports		Search	0
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	JU-202 JU-202	JN-222 JUL-222	JUN-2020 JUL-2020						DBW	Orders By Change Ty	pe	
	LUN202 JUL202	JUN-2220	JUN 2020 JUL 2020							L		
	JUN2020 JUL2020	JUN-2020 JUL-2020	JUN-2020 JUL-2020 MONTH									
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	JUN-2020 JUL-2020 MONTH	JUL-2020 MONTH	JUN-2020 JUL-2020									
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MONTH									MONTH			

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			Show Less		
Show Ord	ler Pending Order Failed	Order Completed			Enter Search Criteria
Order ID Circuit ID User ID	3074967 W0V32760 verizondnm@gmail.com	Status COMPLETED Order Type DBW	Port Speed 512 Kbps Change Type	Billing ID 00209854 Scheduled Date [GMT] 2020/07/18 18:30:06 GMT	Billing Status Status Date [GMT] 2020/07/18 18:30:06 GMT
Order ID Circuit ID User ID	3073934 W0V32760 verizondnm@gmail.com	Status COMPLETED Order Type DBW	Port Speed 768 Kbps Change Type	Billing ID 00209854 Scheduled Date [GMT] 2020/07/10 22:30:05 GMT	Billing Status Status Date [GMT] 2020/07/10 22:30:05 GMT
Order ID Circuit ID User ID	3073549 C0108468 verizondnm@gmail.com	Status COMPLETED Order Type DBW	Port Speed 8 Mbps Change Type	Billing ID Scheduled Date [GMT] 2020/07/08 21:30:15 GMT	Billing Status BILLING NOTIFIED Status Date [GMT] 2020/07/08 21:30:15 GMT
Order ID Circuit ID User ID	3071966 W0V32760 verizondnm@gmail.com	Status COMPLETED Order Type DBW	Port Speed 512 Kbps Change Type	Billing ID 00209854 Scheduled Date [GMT] 2020/06/29 18:30:09 GMT	Billing Status Status Date [GMT] 2020/06/29 18:30:09 GMT

Diagnostics (Router Commands)

Users can issue router commands to verify specifics in their network.

- 1. Click **Router Commands** under Site Details. The Router Commands section appears above Site Details.
- 2. Select a command from the Select Router Command drop-down list.
- 3. Click **Submit**. The system displays the response from the router.

PVC 1795192 VPN LemonAPA JAPAN N/A JPN		Realtime CAR 112 Kbps		Traffic Rule G1 Equipment IP 206.155.31.17	Descri Entitle CC	ments	Preferences // Utilization N Change Not Activation State Not Availabil	r otifications ifications us e	_
Details	Equipment	PE Settings	Orders	Diagnostics	Utilization	Hosted Services	Cloud Services	Other VRF	
elect Router Command Select	0675-i emon4På1			~					
show ip route in [voo	0575:LemonAPA] (ip-prefix	a							
show ip route vrf [V80 ping vrf [V80575:Lem	ionAPA] ip [target_ip_addre	ess] repeat 5							
show ip route vrf [V80 ping vrf [V80575:Lem show interface [Serial show ip vrf interfaces show ip bgp vpnv4 vrf	onAPA) ip [target_ip_addru 13/0/4/12:1675] [V80575:LemonAPA] [V80575:LemonAPA] sum	inary							

Bandwidth Utilization

Users can view a chart displaying circuit utilization over a time period of 1 day through 30 days. The example below shows received and transmitted results for the Verizon Provider Edge (PE) port. Ingress/Received is what Verizon receives from a customer, and Egress/Transmitted is what Verizon sends to a customer. If you were to view the Customer Equipment (CE) port then you would see the opposite measurements. Verizon PE port measurements and CE port Measurements should closely match.



- 1. Click on the utilization tab to view the utilization details.
- 2. By default the daily summary utilization details will be shown.
- 3. To view 15 min interval usage, select and drag to specific duration so that 15 mins interval usage duration can be viewed.
- 4. Use the toggle buttons next to Egress and Ingress speed to view specific usage details (i.e. Only Egress or Ingress traffic).

View Pending Tickets, Orders and Associated Virtual Route Forwarding (VRF)

Click on the "add symbol" to view the details of the circuit ID. You can view the pending tickets and orders in the right end corner of the details tab.

- 1. Click on "pending tickets" to see the status of the ticket on the separate page.
- 2. Click on "pending orders" to see the status of the ticket on the separate page.

nic Network Manager 2.0		Home Network	VNS Operations A	PI Reports			ar circuit ID
ently PP W0Y45154 (8)							
etails Equipment	PE Settings	Orders	Diagnostics	Utilization	Hosted Services	Cloud Services	Other VRF
ircuit Details						2 Pending tickets	Pending orders 1
F Real Time Car		MoxS	peed 5.4 Mbps	Port Speed	0 % Alert Treshold		
) Kbps	Current - 768 Kbps		5.4 Mbps	64 Kbps	Curre	nt - 6.1 Mbps	6.1 Mbps
tilization Alert Thershold	0 %			Class of Service		ETM	
opology	Н			Egress Profile		G1	
E IP Address	152.187.44	166		Interface Name		rlsq0:7	
ccess Type	TI			Access Speed		6.1 Mbps	
outing Protocol	BGP						

Configure eBGP Routing Parameters

Click on the "add symbol" to view the details of the circuit ID.

- 1. Click on near the routing protocol in details tab. The Configure eBGP Routing Parameters section appears below the Circuit ID details.
- 2. Enter the incentive for each eBGP Routing variable. If you are utilizing eBGP or changing to eBGP, you can change the accompanying parameters:
 - a. **AS Number** BGP autonomous system number for the current network.
 - b. **AS Override** Replaces your AS Number with our AS number if the source and destination AS numbers are the same.
 - c. **Send Community** Allows you to send standard communities to us that we will send across the Cloud.
 - d. **Advertisement Interval** Changes default BGP advertisement timers from 30 seconds to 0 seconds.
 - e. **Distribute List** Site will see a default route only.
 - f. Remove Private AS

Note: AS override, send community, Advertisement Interval, Distribute List, Remove Private AS are toggles.

- 3. Click on schedule toggle to select date and time zone.
- 4. Select the values from the drop down menus for date time zone.
- 5. Click on Submit so that the changes will be effected -or- Click on Cancel so that the changes will not take effect.

Configure Static Routes

Static routing is a form of routing that occurs when a router uses a manuallyconfigured routing entry, rather than information from a dynamic routing protocol to forward traffic.

- 1. Click on the Static tab under circuit ID. The Configure Static Routes section appears above Site Details.
- 2. Select CE IP Address for the following bounce. The IP address is populated in the Next Hop field.

OR

Select Sub Interface for the next hop. The sub-interface is populated in the Next Hop field.

3. Select CE IP Address for the Sending IP. The IP address is populated in the Forwarding IP field.

OR

Select Destination IP Address and enter the IP address in the Forwarding IP field.

- 4. Click Add. Include or expel what should be in the switch or should be expelled from the switch.
- 5. If relevant, enter a Process Date/Time to plan this activity.
- 6. Select a period zone starting from the drop list.
- 7. Click Schedule Order if you are planning for a future date.
- 8. Snap Process Order to present your request. The Process Order Confirmation spring up shows your request number.
- 9. Click Submit.

OR

Click Cancel.

Port Speed Changes

Dynamic Port (DPORT) is a feature of DNM. It allows Users to submit a change order online to raise/lower Private IP transport speeds. After a Private IP port is ordered and provisioned, you can use Dynamic Port to adjust the port to a desired speed size. After VEC entitlements for Dynamic Port (and Dynamic CAR) are confirmed, you must initially wait 24 hours before the first change order can be issued. This is due to the IT processing time for the submitted entitlements/permissions.

Note: 1 Private IP Port (or EF CAR) change is permitted per day for circuits with prefixes **"W"** and **"B"**. For circuits with a **"C"** prefix, the following multi-change-per-day rules apply:

- **Unlimited Port Speed Change and Dynamic CAR Requests:** Users may make more than one port speed change and/or EF CAR change request during a 24 hour period. Greenwich Mean Time (GMT) is used as the start/stop reference for a DNM 24 hour time period. These speed changes can be made prior to) 11:00 PM GMT.
- Ability to Reverse Speed Change Requests: Within 60 minutes of making a speed upgrade (or downgrade) request, a User can "correct" the request (as needed) by reversing the speed change request back to the original speed. After 60 minutes the speed change will be established as the new highest speed for the day. That speed is what will be sent to Billing for that day. One speed correction is allowed during a 24 hour period. Alternatively a User can submit a new change order (within 60 minutes) to reverse the mistake.
- **Billing:** Verizon will continue to bill in 24 hour minimum daily increments. The highest speed change request made during a 24 hour period will be the speed sent to Billing for that day.
- **Carry-Over Speed:** The last speed change request entered for the day is the one that is carried over to the next day. This speed will be billed daily going forward unless another speed change is requested.

If you are using Enhanced Traffic Management (ETM) Class of Service and a circuit's EF CAR value is set to 90% of your current port speed, then a Dynamic CAR change order should be issued first to lower the EF CAR value before attempting to lower the circuit port speed via Dynamic PORT.

Class of Service: Committed Access Rate Speeds and Egress Policies

Dynamic CAR (DCAR) allows Users to submit a change order online to raise/lower Private IP port speeds.

However, Users have two options for defining how to set up CAR speeds for use with Private IP circuits:

- **Standard (STD)** Standard option supports Best Effort (BE) CAR speeds only. It does not support Expedited Forwarding (EF Real-Time aka Gold) CAR speeds. Moving from ETM to Standard may influence the voice traffic present on this connection. Dynamic CAR is not applicable to standard CAR speeds.
- Enhanced Traffic Management (ETM) - You can expand port speed EF Real-Time (Gold) CAR up to 90% of the port speed. Moving from Standard to ETM enables you to use DCAR online to change the Gold CAR rate. You can upgrade or downgrade the Gold CAR (EF Real Time) value within the limitation of Gold CAR. Minimum Gold CAR value is OK, and the maximum Gold CAR value can be set up to 90% of the port speed. Increasing Gold CAR has a CPE performance impact. If you have questions, contact your account team before submitting this change. The Gold CAR is policed on Ingress into the Private IP network. Any traffic marked with EF Real Time that exceeds the subscribed Gold CAR value is discarded. If you select Gold CAR (Expedited Forwarding) and are using this for Voice over IP calls, a reduction of the CAR value (e.g. 40.456 reduce to 8K) can directly affect the quality of Voice over IP calls on this link. Ensure that you make a corresponding reduction on the device that determines the call admission control policy for this link as well as making a reduction on the CE router's QoS queuing policies.
- The maximum configurable CAR value is governed by the port speed as well as the **Egress profile** of the Private IP port in service.
- Users may change their "G" or "R" Egress profiles via DCAR. When the Gold CAR value is equal to or greater than 50% of the port speed DCAR will only display "R" level policies.
- **Ingress** refers to traffic which enters the Private IP Provider Edge (PE) device from the User's CE router.

- Private IP Standard: All traffic coming into the PE device on ingress is marked AF3 (DSCP=24).
- Private IP Enhanced Traffic Management (ETM): Customers subscribe to the EF Class of Service and can use 100% of the port for the five additional data classes: AF4, AF3, AF2, AF1, and BE. The EF Class of Service can range from OK up to 90% of the port.
- Egress refers to the traffic which is exiting on the Private IP PE device and being delivered to the User's CE router with a percentage of bandwidth dedicated to each class of service. Egress policies are based on Low Latency Queuing (LLQ) and Class-Based Weighted Fair Queuing (CBWFQ). LLQ is used exclusively for the EF Class of Service and uses strict priority queuing to allow delay-sensitive data (such as Voice over IP) to be sent first, giving delay-sensitive data preferential treatment over other traffic.
- **Class-Based Weighted Fair Queueing (CBWFQ)** is used for the five data classes of service: AF4, AF3, AF2, AF1, and BE. It allows Verizon to specify a percentage allocation of bandwidth to be allocated for each class of traffic.
- The default egress policy for all Private IP customers is: EF: 50%, AF4: 40%, AF3: 39%, AF2: 16%, AF1: 1%, BE: 4%. This means on egress, up to 50% of the port will be dedicated to the EF class of service. Anything which exceeds 50% on egress is discarded. While a User can still use the port for other traffic classes on egress, the EF traffic is given the highest priority. If you are receiving nothing but AF3 traffic on egress, 100% of the port is used for AF3. If you are receiving both EF and AF3, up to 50% of the port bandwidth is dedicated to the EF traffic.
- Customers with IP Telephony (also referred to as Voice over IP, or VoIP) requirements also have the option to set the EF Class of service up to 90% of the port speed. EF: 90%, AF4: 40%, AF3: 39%, AF2: 16%, AF1: 1%, BE: 4%

Note: More information about EF CAR & Egress settings is available in **Appendix** section

How to Modify Port Bandwidth and EF CAR

Click **Modify Bandwidth** in the Actions Menu (or in the Expanded Details view, bottom left of screen)

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PAN N/A JPN	Realtime CAR 112 Kbps	Traffic Rule G1	Description /	Modify Bandwidth
		206.155.31.17	OC DP	Activation Status Not Available



Dynamic Port Speed Menu example:

Dynamic Network Manager User Guide



Scheduler: User may optionally schedule Port/CAR changes out to a year in advance

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							I	Egress Profile*					
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Order Confirmation Pop-Up

Dynamic Network Manager User Guide

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4	Confirm Your Order	start at
128 Kbps Current Speed	You acknowledge that by submitting this order, the monthly charges billed to this account may increase or decrease, in accordance with your contract and the changes you have made to your network bandwidth. Note that these changes may impact your network performance if they are not in accordance with the technical and business rules. Note that these changes may impact your network performance if they are not in accordance with the technical and business rules.	16 Kbps Current Speed
Port Speed	NOTE - You are limited to one successful bandwidth change per 24 hours per site.	EF Realtime CAR
	If your network is not managed by Verizon, please be sure to implement any corresponding CE configuration changes.	
	Click "Accept" below to acknowledge your acceptance of these changes to your account.	
hedule change to happen later	Preview Accept Cancel	
Cancel		

Select "Preview" button to see Before/After Speed Changes before Accepting



Dynamic Network Manager User Guide



Change Order Acceptance (Full Text):

Please ensure that the Port speeds you request are set above the existing CAR for each site. If not, your orders will not be processed.

If your network is not managed by Verizon, please be sure to implement any corresponding CE configuration changes.

Depending on the Private IP PE platform, Verizon could provision 'bandwidth shaping' overhead adjustments on Ethernet Interfaces at the PE Egress, These adjustments may reduce the actual bandwidth available to you, depending on your traffic profile. You must apply policies at your CE egress to prevent packet loss due to Ethernet protocol overhead used within the Company Network. Further details can be obtained from your account team.

You acknowledge that by submitting this order, the monthly charges billed to this account may increase or decrease, in accordance with your contract and the changes you have made to your network bandwidth. Note that these changes may impact your network performance if they are not in accordance with the technical and business rules.

The changes to your network will normally be completed within approximately 15 minutes for customer-managed and DNM Full Automation Managed circuits. If you request simultaneous multiple changes, the changes may take longer. For requests submitted on circuits terminating on Verizon Managed Services Customer Edge (CE) routers without support for Dynamic Network Manager (DNM) Full Automation, your requested changes may take up to 72 hours before the CE routers are manually updated by Verizon. Contact your account team for information about how to upgrade your CE device configuration to allow Full Automation. If your site is not managed by Verizon Business, please be sure to implement any corresponding CE configuration changes.

Depending on the Private IP PE platform, Verizon could provision 'bandwidth shaping' overhead adjustments on Ethernet Interfaces at the PE Egress, These adjustments may reduce the

actual bandwidth available to you, depending on your traffic profile. You must apply policies at your CE egress to prevent packet loss due to Ethernet protocol overhead used within the Company Network. Further details can be obtained from your account team.

NOTE - You are limited to one successful bandwidth change per 24 hours per site (except for "C" prefixed circuits).

Please print a copy of this request for your records.

Click "Accept" below to acknowledge your acceptance of these changes to your account.

Note for Private IP Ethernet Ports with a prefix of B or C

Ethernet Access goes from the customer premise to the nearest Layer 2 device. A Network to Network Interface (NNI) connects the Layer 2 device to the nearest Private IP Provider Edge over a shared interface. The bandwidth on the NNI is not reserved. In the event the NNI or Provider Edge device has reached capacity it will not be possible to increase your Ethernet Port speed. You will however be able to lower the speed. The dropdown menu on Dynamic Port will reflect the port speeds available based on the amount of bandwidth on the NNI. If the NNI or Provider Edge has been capped you will need to engage your Verizon account team (or the Verizon Enterprise Help Desk) to enable submission of an order to increase bandwidth. As part of the ordering process your Ethernet Port will be migrated to an NNI with sufficient bandwidth to support the higher port speed. There will be no change in the Circuit ID; it will remain the same.

Network to Network Interface (NNI) Toggling for DPORT

NNI Toggling allows users to increase the bandwidth speed of a Private IP (PIP) circuit even when the NNI connecting the circuit to a PIP provider edge router (PE) is blocked. NNI Toggling is designed to automatically move a PIP circuit to an adjacent NNI if one is available with sufficient capacity. Blocking can occur for many reasons, most notably when max routes have been reached or there is insufficient bandwidth on an NNI. Such blocking restricts the addition of new circuits to a PE and/or bandwidth upgrades on circuits connected to the PE. Bandwidth downgrades are not impacted by PE/NNI blocking.

NOTE: This feature is available only to <u>US Domestic Commercial</u> customers at this time.

If you are outside of the domestic U.S and experience a similar DPORT issue, please contact your Account Team and have them submit a standard (manual) speed change order. You can also try to submit a DPORT change later since NNI blockages are often temporary.

How It Works

DPORT with NNI Toggling is an automated process that requires your permission to proceed. When the Toggling feature is enabled a new message will display next to bandwidths and will highlight the specific speeds that exceed the current NNI bandwidth (see the screenshot below). The "red" bar (next to the speed) represents the current NNI speed, while the "black" bar represents the speeds that exceed the NNI bandwidth.

In the screenshot below, you can see that the Current Bandwidth is at 8Mbps. If a Port change was made to 9Mbps, it would trigger the NNI Toggling process, assuming there is an alternative NNI available locally with 9Mbps of capacity.



When a User selects a speed that is greater than NNI Capacity + Current Port Speed then a message will appear next to the bandwidth selected (see below). The message notifies the user that the selected bandwidth increase will require a "hot cut" (re-provisioning) order which will

bring down the network for approximately 15 minutes. During this down time, the system will automatically attempt to move the circuit from the blocked NNI to an adjacent NNI with capacity.

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a 10 MDps	56 Kbps	 require brief service down time lasting up to 15 minutes. 	Conversion of the second secon
, 1	Class Of Service*	DPORT /DCAR speed change	,
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Schedule change to happen later			

A confirmation window of the DPORT transaction will be provided. You will need to accept the terms to submit the order.

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		Confirm Your Order		
		You acknowledge that by submitting this order, the monthly charges billed to this account may increase or decrease, in accordance with your contract and the changes you have made to your network handwith. Note that these changes may impact your network performance if they are not in accordance with the technical and business rules. Note that these changes may impact your network performance if they are not in accordance with the technical and business rules.	and the second	
		Depending on the Private IP PE platform, Verizon could provision 'bandwidth shaping' overhead adjustments on Ethernet Interfaces at the PE Egress, These adjustments may reduce the actual bandwidth available to you, depending on your traffic profile. You must apply policies at your CE egress to prevent packet loss due to Ethernet protocol overhead used within the Company Network. Further details can be obtained from your account team. NOTE - You are limited to one successful bandwidth change per 24 hours per site.	56 Kbps International State	
		If your network is not managed by Verizon, please be sure to implement any corresponding CE configuration changes.		
		Click "Accept" below to acknowledge your acceptance of these changes to your account.	EF Realtine CAR	
		Preview Accept Cancel		

How to know the status of your DPORT order including NNI Toggling

Users can track the progress of their DPORT change order (and associated NNI Toggling) in the **Order Status** section. Go there to review order status for the specific PIP circuit change request. If the NNI Toggling automation did <u>not</u> complete for the change order then the following message will display within the Order Status field: **"Layer 2 provisioning failed"**

For assistance at this point the user can click the "Activation Support" button. This will trigger

the Verizon Support team to begin work resolving the technical issue as quickly as possible. Verizon's Support Team for US Commercial customers is available 7 days a week 24 hours a day. They will at a minimum roll the bandwidth change back to bring the network back up. Most often they will resolve the issue and then assist Users with completing the original DPORT speed upgrade request.

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Complete the above Contact Information and "Submit" the request.

Bulk Operations

This Dynamic Network Manager (DNM) feature allows Users to submit multiple circuit changes at one time. There are three categories of DNM bulk changes: 1) **Circuit Descriptions**, 2) **Bandwidth** (Dynamic PORT), **CAR** (Dynamic CAR), **Profile** (Egress) and 3) **Bulk Subscription** (Utilization Threshold Alerts and Circuit Change Activity). Bulk change requests can be manually entered directly into the tool or via a DNM spreadsheet template (where applicable).

<u>Please note that only Private IP Single VRF (virtual route forwarding) and PORT Multi-VRF circuits</u> are supported for Bulk speed changes currently. PVC Multi-VRF circuit support is targeted for 4Q20.

Tip: If you elect to use the DNM spreadsheet template to enter your circuits, you can first use DNM's Export function to download the VPN/circuit list you wish to modify and then copy/paste the appropriate values into the Bulk spreadsheet template fields.

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Circuit Description

This option allows changes to Circuit descriptions (only). You can <u>manually enter</u> circuit information or enter it into a DNM spreadsheet template.

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Note: Circuit information submitted via spreadsheet for <u>any</u> DNM Bulk change request must be entered in a DNM spreadsheet template format. If data does not match the Template format provided, the sheet will not be uploaded.

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After the Excel file (or your manually entered list) has been entered, Click Upload

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Dynamic Network Manager User Guide

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Completed Tab displays the jobs that have been processed

Bandwidth, CAR, Profile - Change with pre-set speeds

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Enter Bandwidth, CAR and Profile selections in drop down menus

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Select the Circuit IDs and PVC IDs Search by Circuit ID/PVC ID/VPN Name/Bandwidth/CE Realtime CAR/Egress profile/Location	v		

Click Circuits bar to search & select circuits for Bulk changes

Dynamic Network Manager User Guide

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Click Upload to submit circuits for Bulk Changes

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Click Validate

Dynamic Network Manager User Guide

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Click Confirm Validation

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Important Note: DNM will send you an email confirmation when all submitted circuits are processed after the **Confirm Validation** step. If however, you go to the **Jobs in Progress** tab to review status before receiving the DNM email, then hit **Refresh** to see the most current list of validated circuits (or hit **Refresh All** for in-progress status of all active requests). DNM processes circuit validations in batches so you may need to hit

Refresh/Refresh All several times. Click **Revalidate** after making corrections (or deletions).

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Click **Place Order** once Revalidation is complete.

This is the final step to entering the Bulk change request.

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Success Tab show circuits that have been successfully submitted

Bandwidth, CAR, Profile - Upload Excel with custom speeds

DNM allows you to drag & drop an Excel spreadsheet into DNM with your defined circuit changes. This spreadsheet must be in the same format as the accessible DNM Excel template.

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Click Upload after dropping Excel file into DNM

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DNM Speed Change Template

Dynamic Network Manager User Guide

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When finished editing, click Validate

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Click Confirm Validate

Dynamic Network Manager User Guide

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Important Note: DNM will send you an email confirmation when all submitted circuits are processed after the **Confirm Validation** step. If however, you go to the **Jobs in Progress** tab to review status before receiving the DNM email, then hit **Refresh** to see the most current list of validated circuits (or hit **Refresh All** for in-progress status of all active requests). DNM processes circuit validations in batches so you may need to hit **Refresh/Refresh All** several times. Click **Revalidate** after making corrections (or deletions).

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Click **Place Order** once Revalidation is complete.

This is the final step to entering the Bulk change request.

Bulk Subscriptions

Bulk subscription changes work very similarly to single changes that are made in the "Preferences" section displayed for individual circuits. Alternatively here you can apply changes to multiple circuits/VPNs.

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Select one or all listed circuits to submit for Alerts/Notifications subscription

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Schedule the desired frequency of Emailed Alerts

Modify Shaping Adjustment

The Ethernet cards handle shaping and policing based on L2 overhead. In the case of Ethernet encapsulation when shaping, the router does not include Inter-Frame Gap (IFG), Preamble, Start Frame Delimiter (SFD). When dealing with small frames, this overhead could be considerable. The marketed sold Ethernet speeds and the transmission equipment assumes L1 payload. To adjust for this discrepancy, the shaping rate on the PEs can be adjusted to compensate for the Ethernet overhead depending on the type of service that the customer is buying (voice, voice/data combined, data).

Circuit Details				2. endin	g tickets 0 🗄 Pending
EF Real Time Car		Max Speed 12.3 Mbps	Port Speed	sshold	
0 Kbps	Current - 512 Kbps	12.3 Mbps	1 Mbps	Current - 10 Mbps	3
Utilization Alert Thershold	0 %		Class of Service	ETM	
Тороlogy	н		Egress Profile	G1	(
CE IP Address	152.177.14.66		Shaping Profile	93%	(
Access Type	ETH10Gig		Interface Name	TenGigE0/1/0/3	
Routing Protocol	BGP	Ø	Access Speed	20 Mbps	
Modify Bandwidth Edit Shaping Profile					
Shaping Profile*					
Scheduling					
Submit Cancel					

- 1. Click on shaping profile in the details tab. The Modify Shaping Adjustment for Ethernet Overhead section appears above the Site Details.
- 2. Select 76, 85, or 94 from the Shape PE departure data transmission to drop-down rundown.
- 3. Enter a Process Date/Time to plan this activity, if relevant.
- 4. Select a period zone starting from the drop list.
- 5. Click Schedule Order on the off chance that you are booking this for a future date.
- 6. Click Process Order to present your request. The Process Order Confirmation spring up shows up.
- 7. Click Accept to recognize that the solicitation may affect your system and that you oversee rolling out any related improvements required on your client edge (CE) switch. You will get an email when the solicitation is finished. There is no restriction to the quantity of non-billable design changes that can be mentioned, yet please permit 24 hours for changes submitted Monday through Friday to be finished. On the off chance

that a solicitation is made on an end of the week or US occasion, it will be handled on the following industry day.

8. Click Print to print a duplicate of your solicitation.

Modify Admin Status

- 1. Click next to **Interface Name** in the Site Details. The Modify Admin Status section appears above the Site Details.
- 2. Enter a Process Date/Time to schedule this job, if applicable.
- 3. Select a time zone from the drop-down list.
- 4. Click **Schedule Order** if you are scheduling this for a future date.
- 5. Select **no-shutdown** or **shutdown** from the New Admin Status drop-down list.
- 1. Click **Process Order** to submit your order. The *Process Order Confirmation* pop-up appears.
- 2. Click Accept.

Utilization Alert Thershold	0 %		Class of Service	ETM	
Тороlogy	Н		Egress Profile	G1	\frown
CE IP Address	68.138.222.58		Interface Name	Serial0/9/2/0/1/1/1/2:1	0
Access Type	E1		Access Speed	0 Kbps	
Routing Protocol	BGP	I			

	ModifyBasedvidth
/	Edit Admin Status
	Admin Status* Select
	Schedule change to happen later
	Submit Cancel

Open Quick (Trouble) Ticket

1. Click **Headphone** icon under *Site Details*. The *Create Quick Ticket* pop-up appears.

→ Bulk Op	perations	⊥ Export	Y	S
Actions		~	ল চ	-
Preferences // Utilization No Change Noti	otifications fications			
Activation Statu Active	S			ck
Cloud Services	Oth	er VRF		Feedbac

- 2. When you open a ticket, the circuit ID for which you are viewing in the *Site Details* automatically populates. Enter a different circuit ID, if applicable.
- 3. Click **Next** to verify service and enter the ticket information.

Network Transit Delay

This section displays Verizon metrics for Network Transit Delay (Latency) between Private IP PE (provider edge) devices. This is not a report but rather a listing of those metrics. You can see what Verizon's Service Level Agreements (SLA) Latency metrics are between the selected sites.



Select the region you want, if applicable. Then use the filters to view the region, country, or city that you want to view on the map. By clicking on any Verizon PE location/city we can display the latency measurements between that location and all other Verizon PE locations.



You can also view Network Transit Delay for User VPN sites by adding a VPN site(s) and clicking to see the relative transit delay metrics. In the below graph we added a user VPN site (Tokyo, Japan). By clicking now on Tokyo we can show its relative Network Transit Delay measurements between that location and all other Provider Edge router locations.



Network Transit Delay



APPENDIX

Quality of Service (QoS) Egress Traffic Profiles

PIP ETM General Configuration, PIP STD, PIP Data Centric and PIP Data/Voice Combined

The egress QoS policies referenced in the table below are for customers using 50% or less of the EF/Voice over IP CoS and are allocating more bandwidth for other applications, such as data and video.

Profile #	Profile Identifier	EF Egress	AF4	AF3	AF2	AF1	BE	Comments
1	_G1	50%	40%	39%	16%	1%	4%	Default profile – balanced allocation
2	_G2	50%	48%	20%	16%	12%	4%	Video-centric #1
3	_G3	50%	68%	12%	10%	8%	2%	Video-centric #2
4	_G4	50%	15%	20%	20%	1%	4%	Data-centric with emphasis on bulk- transfer applications
5	_G5	50%	15%	60%	60%	1%	4%	Data-centric with emphasis on transactional applications
6	_G6	50%	15%	40%	40%	1%	4%	Data-centric with balanced bulk-transfer and transactional applications
7	_G7	50%	15%	10%	10%	5%	30%	Data-centric with large percentage of unmarked (BE- marked) applications and bulk-transfer applications
8	_G8	50%	30%	10%	10%	5%	25%	Balanced QoS w/ ample video for a 384K video on a T1
9	_G9	50%	20%	30%	30%	10%	5%	Data-centric w/ balanced applications (matches HSBC policy)

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Profile #	Profile Identifier	EF Egress	AF4	AF3	AF2	AF1	BE	Comments
10	_G10	50%	15%	20%	20%	5%	40%	Data-centric with large percentage of unmarked (BE- marked) applications and transactional applications
11	_G11	50%	30%	20%	20%	10%	20%	Data centric with balanced allocation
12	_G12	50%	60%	5%	10%	5%	20%	Video centric/minimum control traffic
13	_G13	50%	10%	40%	30%	5%	15%	Data balanced apps #2
14	_G14	50%	20%	25%	25%	10%	20%	Data balanced AF3/AF2 centric
15	_G15	50%	20%	10%	20%	40%	10%	Data centric with emphasis on Scavenger/Standard data apps

PIPETM Voice Centric Configuration

The egress QoS policies referenced in the table below are for customers using 90% of the EF/Voice over IP (VoIP) CoS for VoIP and are allocating more bandwidth for other applications, such as data and video.

Profile #	Profile Identifier	EF Egress	AF4	AF3	AF2	AF1	BE	Comments
1	_RT	90%	40 %	39 %	16%	1%	4%	Voice default- centric
2	_R2	90%	48 %	20 %	16%	12%	4%	Voice-centric and video-centric #1
3	_R3	90%	68 %	12%	10%	8%	2%	Voice-centric and video-centric #2

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4	_R4	90%	15%	60 %	20 %	1%	4%	Voice-centric and data-centric with emphasis on bulk- transfer applications
5	_R5	90%	15%	20 %	60 %	1%	4%	Voice-centric and data- centric with emphasis on transactional applications
6	_R6	90%	15%	40 %	40 %	1%	4%	Voice-centric and data- centric with balanced bulk- transfer and transactional applications
7	_R7	90%	15%	30 %	10%	5%	30 %	Voice-centric and data-centric with large percentage of unmarked (BE- marked) applications and bulk-transfer applications
8	_R8	90%	30 %	20 %	10%	5%	25 %	Balanced QoS w/ ample video for a 384K video on a T1
Profile #	Profile Identifier	EF Egress	AF4	AF3	AF2	AF1	BE	Comments
9	_R9	90%	20 %	35%	30 %	10%	5%	Voice-centric w/ balanced applications (matches HSBC policy)
10	_R10	90%	15%	10%	20%	5%	40%	Voice-centric w/ large percentage of unmarked (BE- marked) applications and

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								transactional applications
11	_R11	90%	30%	20%	20%	10%	20%	Voice centric with balanced allocation
12	_R12	90%	60%	5%	10%	5%	20%	Video centric/minimum control traffic
13	_R13	90%	10%	40 %	30 %	5%	15%	Voice/Data Balanced apps #2
14	_R14	90%	20 %	25%	25 %	10%	20 %	Data Balanced AF3/AF2 Centric
15	_R15	90%	20 %	10%	20 %	40 %	10%	Data-centric with emphasis on Scavenger/Stand ard Data Apps

Customer Edge Configuration Settings

STD QoS DPORT, and ETM to STD (Customer Managed)

The following configuration steps are specific to Cisco router platforms. For other vendor CPE, consult the user manual with regards to changing the interface bandwidth speed.

We recommend setting up an egress traffic shaping rate on your CE router's WAN interface according to your changed QOS settings. Follow these instructions to prepare your router for Dynamic Port changes.

!

policy-map parent

class class-default

shape average < DPORT-in-bps>

!

The policy map needs to be applied to the WAN interface in the outgoing direction.

!

interface <WAN Interface>

service-policy output parent

!

For smaller and mid-size Cisco routers, the shape command uses a Tc default value of 25 milliseconds if no Bc, and Be values are specified with the shape command. For Ethernet WAN circuits, we recommend lowering the shape Tc value to 4 milliseconds and setting the Be to 0 to avoid buffering issues in the transmission path.

If your router does not shape to layer 1 speeds (most Cisco routers will not), be aware that the layer 2 encapsulation overhead is added AFTER the router shaped the traffic to the configured rate.

We recommend lowering the shape rates accordingly, especially for Ethernet WAN circuits. For Ethernet WAN circuits, our generic recommendation is to adjust the shaping speed to:

76% of your DPORT speed in case of pure VoIP traffic (avg. packet size of 78 bytes)

85% of your DPORT speed in case of mixed data and VoIP traffic (avg. packet size of 140 bytes)

94% of your DPORT speed in case of pure data traffic (avg. packet size of 404 bytes)

The recommended configuration is:

!

policy-map parent

class class-default

shape average <adjusted DPORT-in-bps> <adjusted DPORT-in-bps x 0.004> 0

!

EXAMPLE:

For a Fast Ethernet WAN circuit with a selected DPORT speed of 60 Mbit/s on a Cisco 7200, and a mixed VoIP and data traffic pattern, the recommended values and configuration are:

<adjusted DPORT-in-bps>: 60,000,000 x 85% = 51,000,000

<adjusted DPORT-in-bps x 0.004>: 51,000,000 x 0.004 = 204,000

!

policy-map parent

class class-default

shape average 51000000 204000 0

!

```
interface FastEthernet0/0
```

service-policy output parent

!

ETM QoS DPORT, DCAR, Custom Egress, and STD to ETM

The following configuration steps are specific to Cisco router platforms. For other vendor CPE, consult the user manual with regards to changing the queuing parameters. CBWFQ is typical for Silver CAR and LLQ/Priority Queuing is typical for Gold CAR.

We recommend setting up a nested QOS policy on your CE router's WAN interface according to your changed QOS settings. The outer (or parent) policy should shape all traffic according to your selected DPORT speed. The inner (or child) policy should contain bandwidth allocations according to your selected DCAR speed and Custom Egress profile. Follow these instructions to prepare your router for Dynamic CAR changes.

```
!
```

policy-map child

class realtime

priority <DCAR-in-kbps>

police <DCAR-in-bps> conform-action transmit exceed-action drop

```
!
```

class priority

bandwidth remaining percent <% for AF4 according to selected custom Egress profile #>

random-detect dscp-based

class missioncritical

bandwidth remaining percent <% for AF3 according to selected custom Egress profile #>

random-detect dscp-based

class transactional

bandwidth remaining percent <% for AF2 according to selected custom Egress profile #>

random-detect dscp-based

class general

bandwidth remaining percent <% **for AF1** according to selected custom Egress profile #> random-detect dscp-based

class class-default

bandwidth remaining percent <% for BE according to selected custom Egress profile #> random-detect dscp-based

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! policy-map parent class class-default shape average <DPORT-in-bps> service-policy child

!

The parent policy map needs to be applied to the WAN interface in the outgoing direction.

!

interface <WAN Interface>

service-policy output parent

!

For smaller and mid-size Cisco routers, the shape command uses a Tc default value of 25 milliseconds if no Bc, and Be values are specified with the shape command. For Ethernet WAN circuits, we recommend lowering the shape Tc value to 4 milliseconds and setting the Be to 0 to avoid buffering issues in the transmission path.

If your router does not shape to layer 1 speeds (most Cisco routers will not), be aware that the layer 2 encapsulation overhead is added AFTER the router shaped the traffic to the configured rate.

We recommend lowering the shape rates accordingly, especially for Ethernet WAN circuits. For Ethernet WAN circuits, our generic recommendation is to adjust the shaping speed to:

76% of your DPORT speed in case of pure VoIP traffic (avg. packet size of 78 bytes)

85% of your DPORT speed in case of mixed data and VoIP traffic (avg. packet size of 140 bytes)

94% of your DPORT speed in case of pure data traffic (avg. packet size of 404 bytes)

The recommended configuration for the parent policy is:

!

policy-map parent

class class-default

shape average <adjusted DPORT-in-bps> <adjusted DPORT-in-bps x 0.004> 0

service-policy child

!

EXAMPLE:

For a Fast Ethernet WAN circuit with a selected DPORT speed of 60 Mbit/s, DCAR speed of 10 Mbit/s, a G1 Custom Egress profile on a Cisco 7200, and a mixed VoIP and data traffic pattern, the recommended configuration is:

<**DCAR**-in-kbps> : 10,000 <DCAR-in-bps>: 10,000,000 <% for AF4 > : 40 <% for AF3 > : 39 <% for AF2 > : 16 <% for AF1 > : 1 <% for BE > : 4 <adjusted DPORT-in-bps>: 60,000,000 x 85% = 51,000,000 <adjusted DPORT-in-bps x 0.004>: 51,000,000 x 0.004 = 204,000 ! policy-map child class realtime priority 10000 police 1000000 conform-action transmit exceed-action drop ! class priority bandwidth remaining percent 40 random-detect dscp-based class missioncritical bandwidth remaining percent 39

- random-detect dscp-based
- class transactional

bandwidth remaining percent 16

random-detect dscp-based

class general

bandwidth remaining percent 1

random-detect dscp-based

class class-default

bandwidth remaining percent 4

random-detect dscp-based

!

policy-map parent

class class-default

shape average 51000000 204000 0

service-policy child

!

interface FastEthernetO/0

service-policy output parent

!

Glossary

Looking Glass is a no cost network statistics reporting functionality that is available to all Private IP customers globally. It provides the ability for view only 'Looking Glass' into your Private IP Network parameter settings. The following Network Attributes are available for viewing:

- VPN Level Information
- VPN Defaults
- Site Information
- PE Interface Info
- CE Interface info
- Class of Service Info
- VRF Parameters
- BGP Routing Info
- RIP Routing Info
- PIP Static Routes
- Site of Origin information

Configuration Parameter	Description						
Multicasting RP Address	Multicasting Rendezvous Point Address						
Multicasting MDT	Multicast distribution tree IP address						
Apply Static RP ACL	Removes access list 20, only used by ICB for multiple static rendezvous points						
Multicasting VPN	Turn up new sites with multicasting						
Multicasting Number of Routes	Multicasting number of routes						
Multicasting Routes Threshold	Multicasting routes threshold at which to generate warning message						
Change Admin Status	Do a shutdown or no shutdown to set the admin status on the interface						
МТU	Mean transmission unit						
IP Verify Unicast	An anti-spoofing command, also needed on host sites with hub and spoke topologies						
VPN Topology	Type of VPN topology						

Redistribute	Redistribute routes learned from					
Maximum Routes	Maximum routes for the VFR					
Concord Enabled	Concord reporting enabled					
Maximum Paths	Number of expected sites that will be sending out the same routes to load share amongst					
EIBGP Load Sharing	Allows for external and internal BGP load sharing					
BGP Import Optimization	Make the PE import the paths learned via all the route reflectors					
Default Info Originate	A method of sending out a default route across our network					
OSPF Default Info Originate	Redistributes the default route from BGP to OSPF					
Routing Protocol	Routing protocol between the CE and PE					
BGP Remote AS	BGP autonomous system number for the customer network					
OSPF Cost	OSPF costing for the interface					
Timers Keepalive	Changes the default BGP keepalive from 60 seconds					
Timers Hold time	Changes the default BGP hold time from 180 seconds					
BGP Send Community	Allows customers to send standard communities to us and we will send across the cloud					
Allow AS In	Allows our own AS number to be seen by our PE routers x number of times					
Default AS Override	Replaces the customer's AS number with our AS number if source and destination AS numbers are the same					
Replace AS	Replace our private AS number 65000 with our registered AS number 1684 or a private one in range 64512-65535					

Customer Support & Training

Customer Support

Contact customer support for product and general platform questions or errors.

Contact your account team with any account specific questions on equipment or service, pricing information, or adding additional users to the Verizon Enterprise Center.

Click on your name in the top right corner of the screen. Click **Contact Us & Send Feedback**.

- U.S. Call 1.800.569.8799 (Mon Fri 9 AM 6 PM ET)
- Live Chat: Icon located in VEC, Networx and Calnet Portals
- EMEA Customers: 00.800.4321.5432
- APAC Customers: vec-support@verizon.com

Training

Go to https://customertraining.verizon.com to enroll in training or to download user and other reference guides. Log in with an existing login or create a new one.