Dynamic Network Manager User Guide - Private IP

Version 7.6
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verizon

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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 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 (VERIZON ENTERPRISE CENTER) 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. Note: 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.

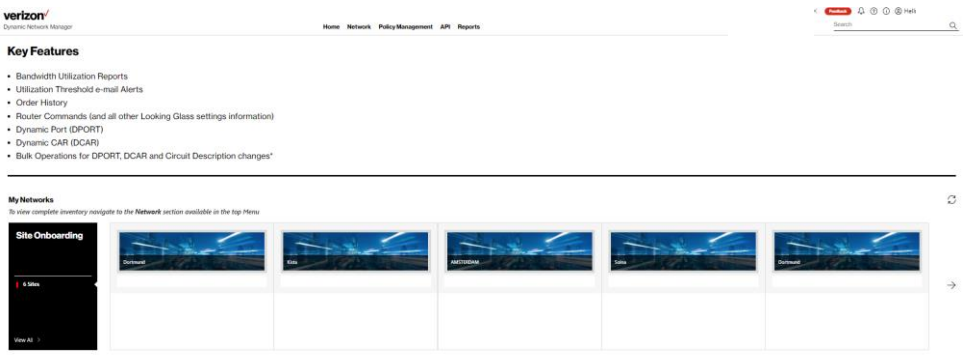
Accessing Dynamic Network Manager

Click Dynamic Network Manager on the Verizon Enterprise Center (VEC) home page to go to the DNM Dashboard page. It can be found under "Managed Accounts / Product Tools" or when you scroll down under product tools.

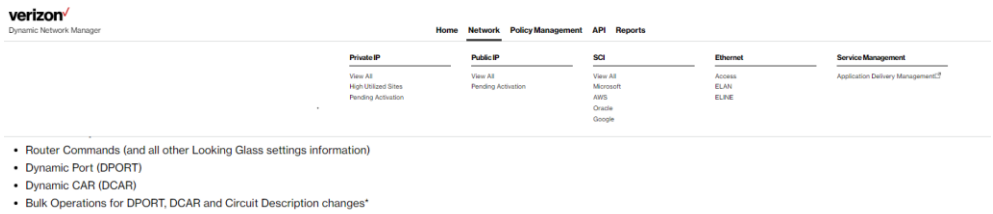
1. Go to http://sso.verizonenterprise.com. The sign in page appears.
2. Enter your user name and password and Click Sign In.
3. Verizon Enterprise Center home page appears.
4. Click on Dynamic Network Manager, found under Product Tools.

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.



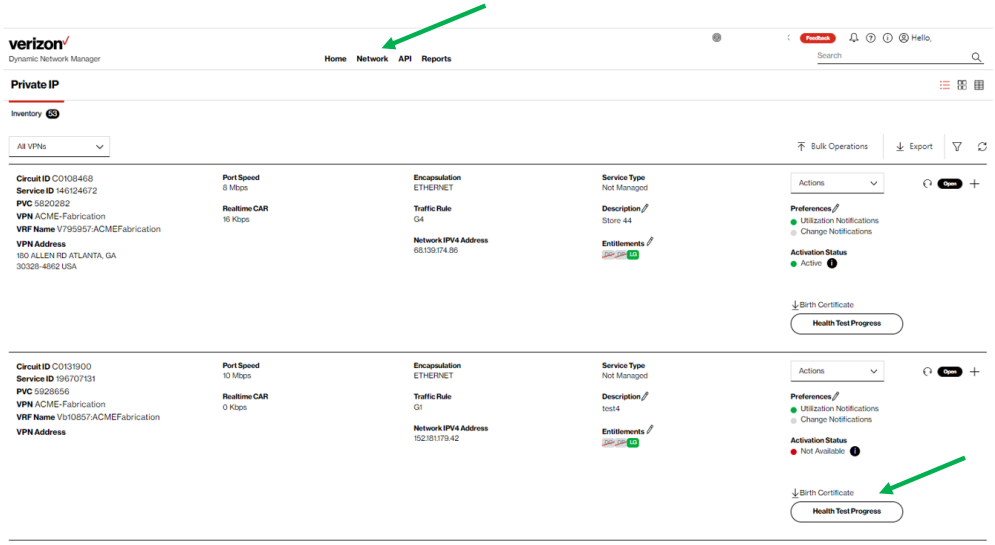
Select **Network** to see your Verizon Private IP, Internet Dedicated, Ethernet Switched E-Line or Secure Cloud Interconnect (SCI) Services.



- Router Commands (and all other Looking Glass settings information)
- Dynamic Port (DPORT)
- Dynamic CAR (DCAR)
- Bulk Operations for DPORT, DCAR and Circuit Description changes*

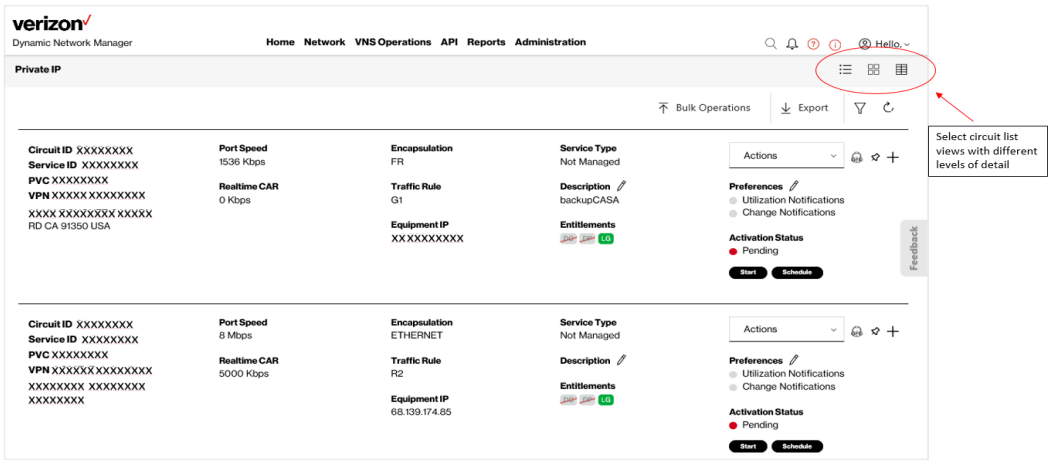
The Dashboard displays a menu of your Verizon Enterprise Center entitled IP services choices. Choose Network to list the circuits in inventory that you have permission to review.

Private IP circuit List after selection under Network Menu



Birth certificate: This option is for information only and allows users to download the initial details for the circuit. This includes the RFC 1564 test, if it exists, the initial activation of a circuit. It will provide the Activation date, user that activated the circuit, RFC 1564 test results if they exist. Current PVC / EVC Configuration and Traffic Utilization.

Health test program: This option is for users to verify the health of the logical systems to ensure all systems are accurate. Users can use this option, if they are seeing order failures to run through to verify DNM that interact with DNM.

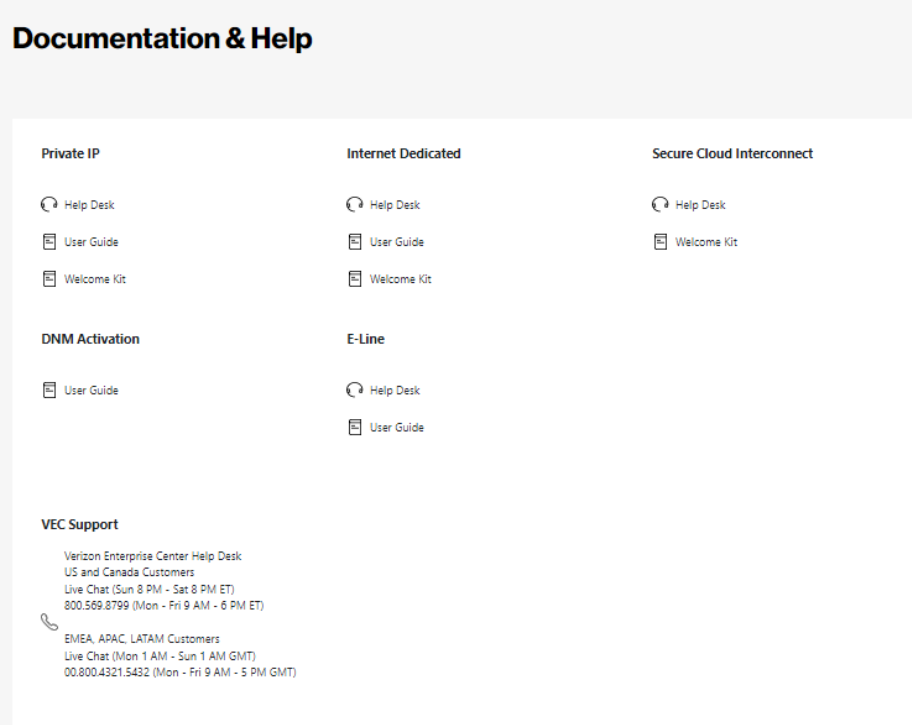


Search, notification alert, documentation & help, interactive tour

The Dashboard offers Search commands, notification alerts as well as documentation and help options. See the Icon list for each below.

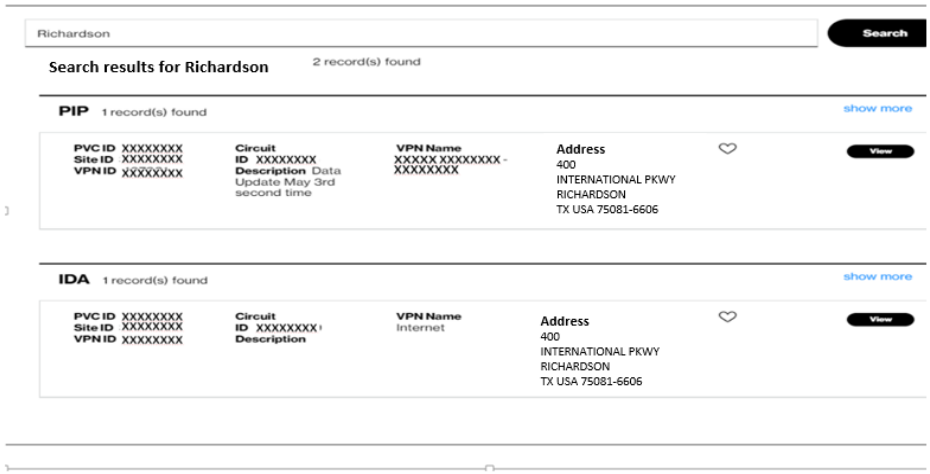
Documentation & help, interactive tour

The documentation help screen provides links to user guides, help desk for each product.

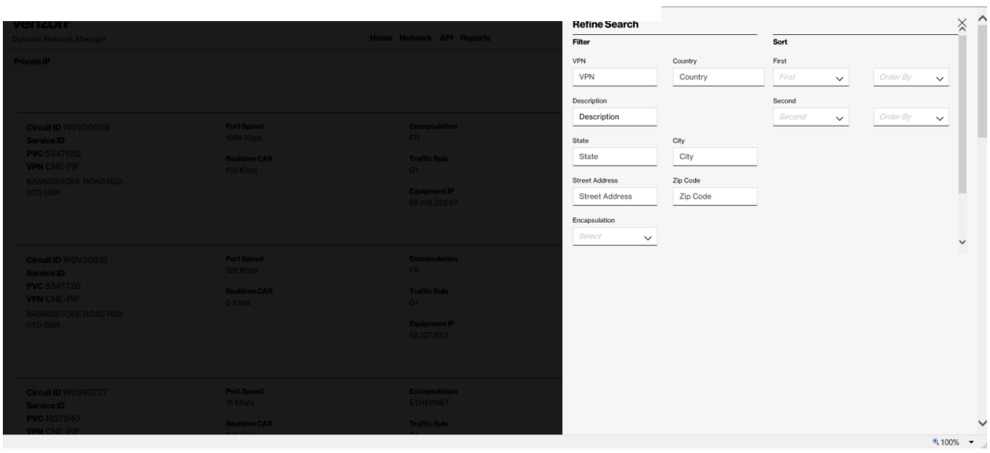


Search

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.

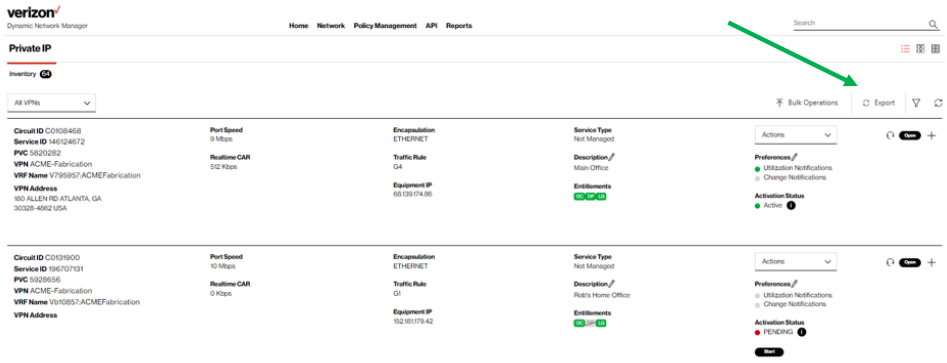


Search Filter Options



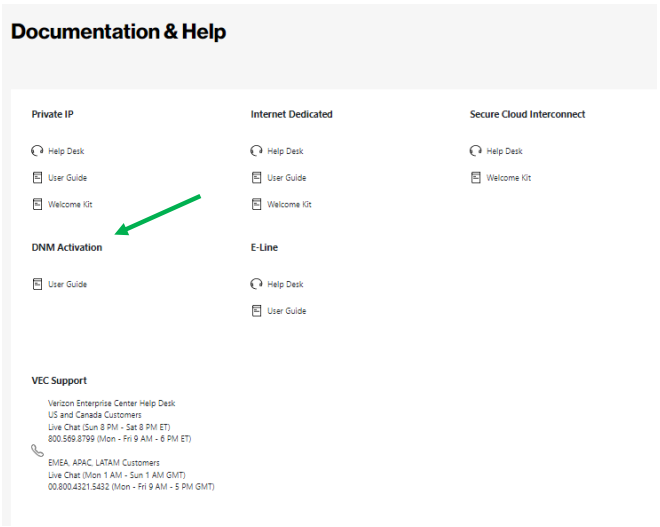
Export

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



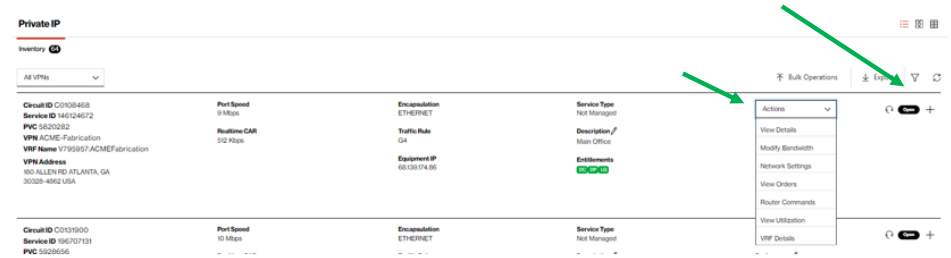
Site activations

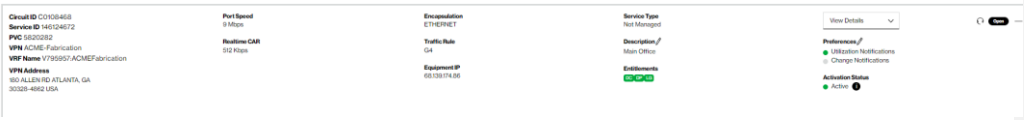
Users can activate their network circuits and EVC's using DNM. Site Activation User guide was developed specific for that function. Refer to the "?" on the top right section of the home page to pull open the documentation and step by step guide.



View circuit details

You can view the details of the circuit by clicking on the + or open the drop-down box and click on View details.





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 / threshold alerting options

Utilization notifications allow customers to set up Utilization Bandwidth alerts. Customers can choose which circuit to enable threshold alerting as well as the percentage of utilization from 30% up to 90%. They can decide to alert daily, weekly or monthly based on their preferences. Follow these steps to activate threshold alerting on your specific sites. Utilization Alerting is a user selected option. The tool will notify the user who has subscribed to the alert only. The alert will come via email to the specific user.

There are two types of Utilization Alerting to choose from

1) Busy Hours. This allows each circuit to be set up to alert when the circuit utilization exceeds the selected percentage. The user is provided the option to select the following options:
   a) Alerting time period average: Day, Week, or Month. The Utilization statistics are summed together and averaged over this time period.
   b) Busy Hours: User chooses the busy hours for the given circuit
   c) Days to monitor: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday
   d) Time Zone: User is allowed to select the time zone for that circuit
   e) Alerting Percentage: User selected the percentage, 60, 70, 80% when the average exceeds this percentage an alert is provided

Users will select the specific criteria. Based on the selections, the Utilization Statistics will be averaged and alert if the value exceeds the given alert percentage value.

Example: Circuit C123456 is in New York. User selects these options:

a) Alert Average of weekly
b) Busy hours of 7 am to 6 pm
c) Days to monitor: Monday through Friday
d) Time Zone of EST
e) Alerting Percentage of 80%

Tool will average the Utilization Statistics weekly for this circuit. The utilization data will be pulled for all 5 minutes increments within the 7 am to 6 pm EST for Monday through Friday. If the average for the week exceeds 80% an email alert will be sent to the user who subscribed to the alerts.

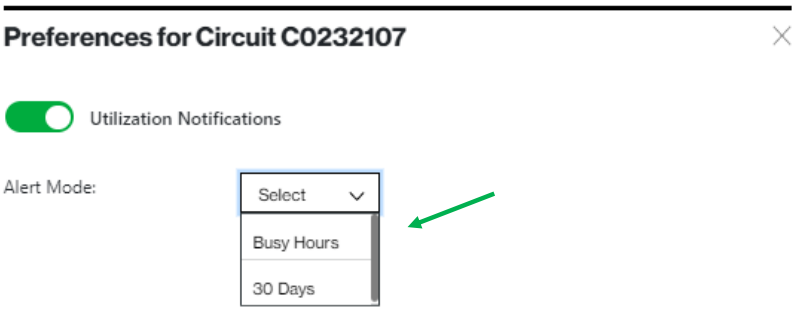
2) 30 Days or Daily Average. This is the daily average of the sum of the utilization statistics captured for the 30 days for each 5-minute increment within a 24-hour day.

Example: All Utilization data is summed together for the full month, for every 5-minute increment and averaged for the number of days. If the average exceeds the percentage selected the tool will alert the user who subscribes to the alert.

How to set up utilization notifications

From the Circuit listing page

Next to the preferences, Click on pencil.

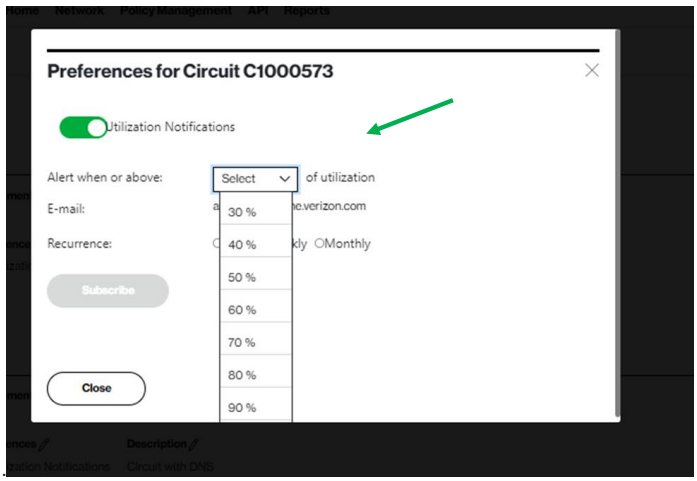


Click the Utilization Notifications toggle to change it from Red to Green.

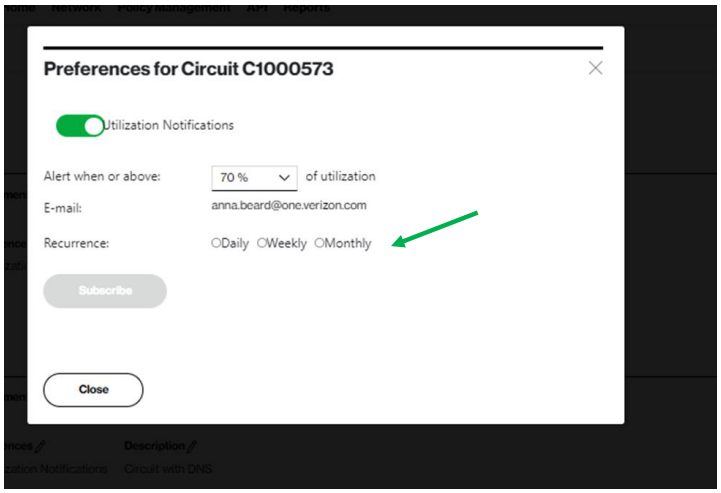
Choose from the drop down the type of utilization alerting preferred.

1) Busy Hours.
2) 30 Days (30 Daily Average).

How to set up 30 day daily average alerting



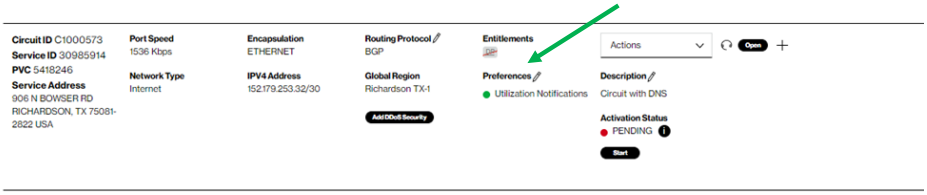
Select Alert Percentage from drop down box.



Select how often you want to be alerted; Daily, Weekly or Monthly.

Click on Subscribe.

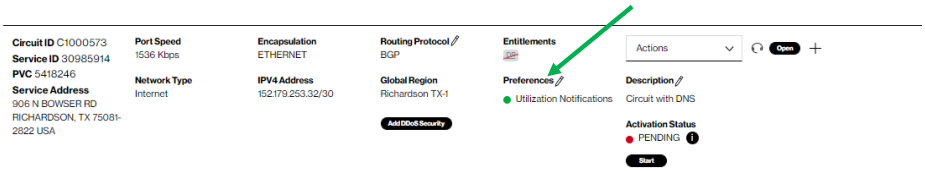
Click Close.

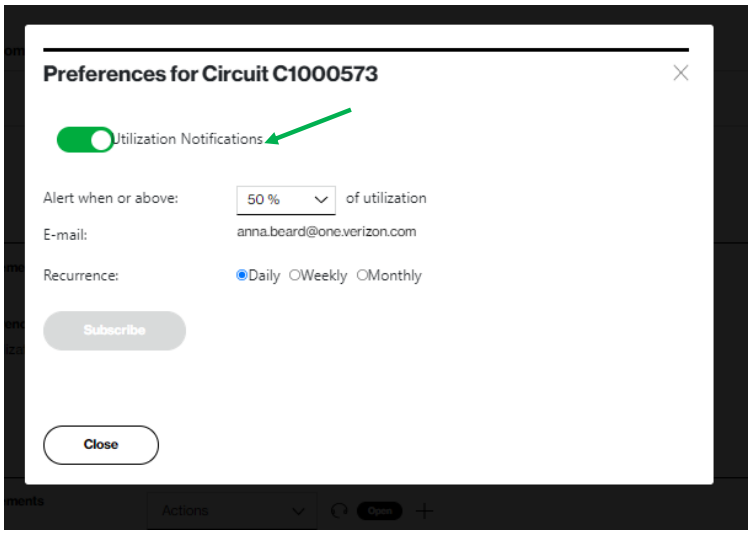


Utilization Notification will display Green as active.

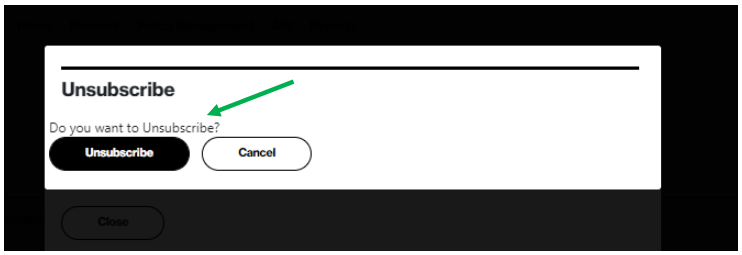
How to turn off utilization alerting

To turn the notifications off, just start from the beginning, click on the Pencil next to Preferences.

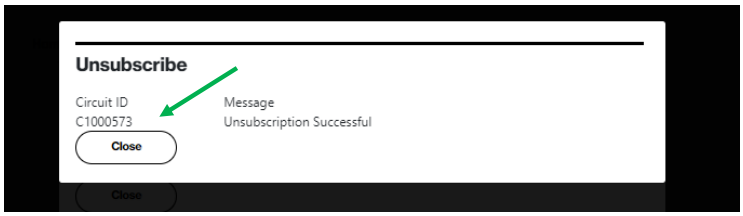




Click on Green Button next to Utilization Notifications.

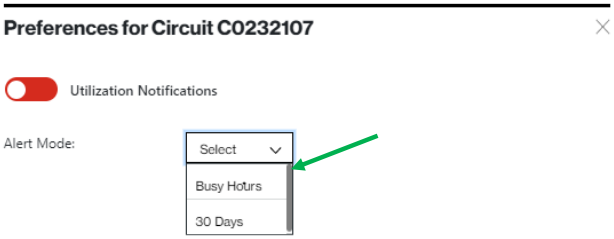


Click on Unsubscribe.

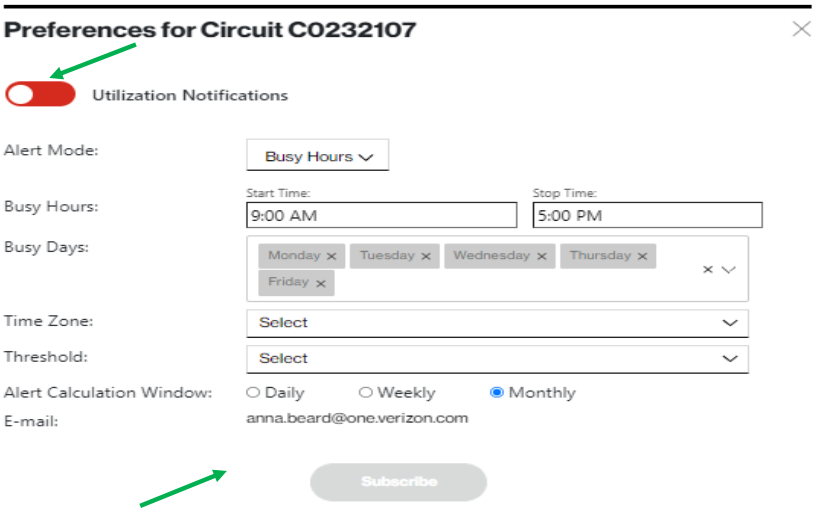


It will confirm Unsubscribe is successful, Click close.

How to set up busy hours alerting



Users will select Busy Hours from the drop down.



The system has default most common values.

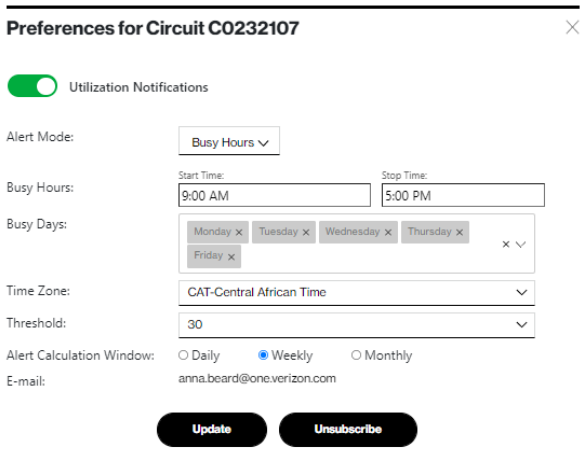
Click the Utilization Notifications toggle to change it from Red to Green.

Users should select actual values for each selection option as needed for their circuit.

Once all selections are complete the “Subscribe” button will appear. Click on the Subscribe button.

Tool will return a “Subscription Successful” when active.

If one of the options needs to be changed.

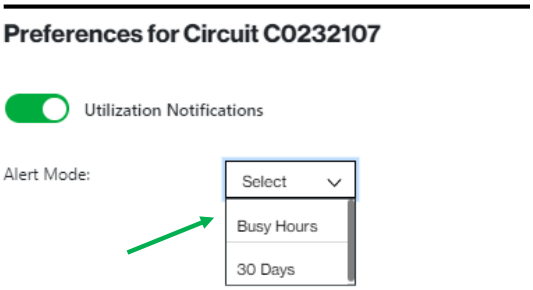


Change the specific option(s) that requires to be changed.

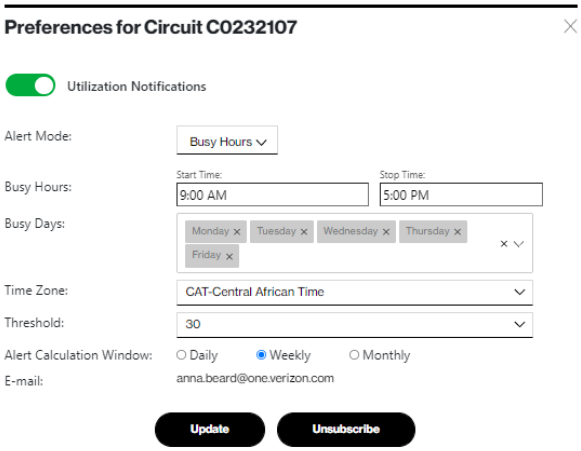
Click on “Update”.

Tool will return the green bar with the “Subscription Successful”.

Unsubscribe from busy hours



Users will select “Busy Hours” from the drop-down menu.



Users will select the “Unsubscribe” button.

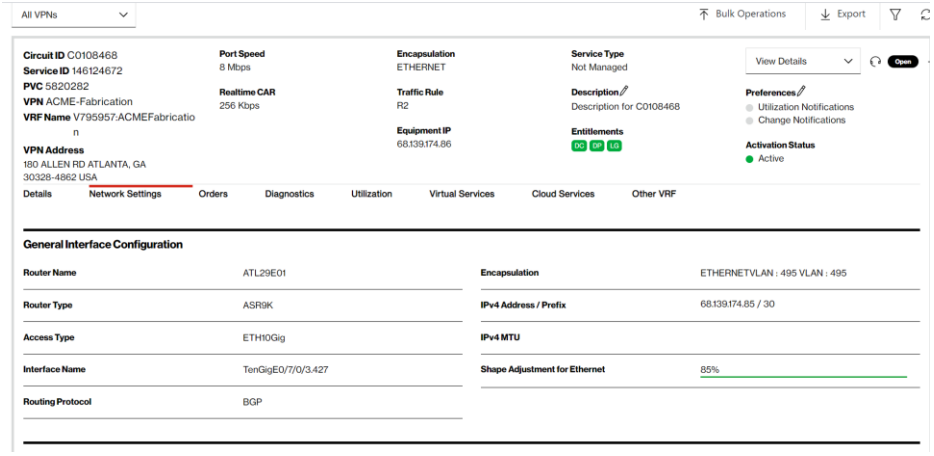
Tool will respond with “Subscription Successful”.

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.



Virtual Route Forwarding (VRF)

VRF Name	V795957:ACMEFabrication	**WAN Analysis Reporting**	No
Topology	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		

IPv4 eBGP Routing Information

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

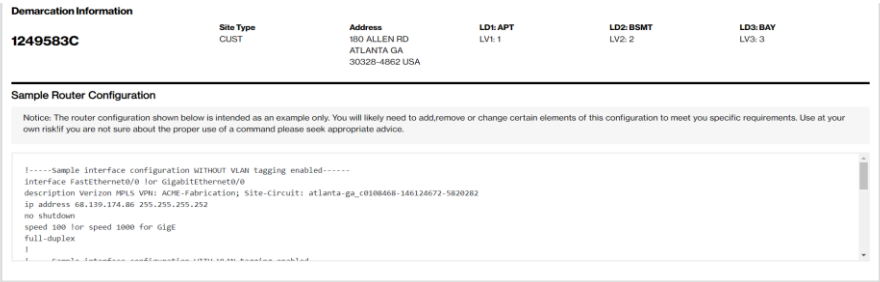
IPv4 Address / Prefix	68.139.174.86 / 30	**Layer 2 Encapsulation**	ETHERNET VLAN : 3
Server Level	Not Managed		

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		



STD QoS DPORT, and ETM to STD*

The Customer Edge (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*

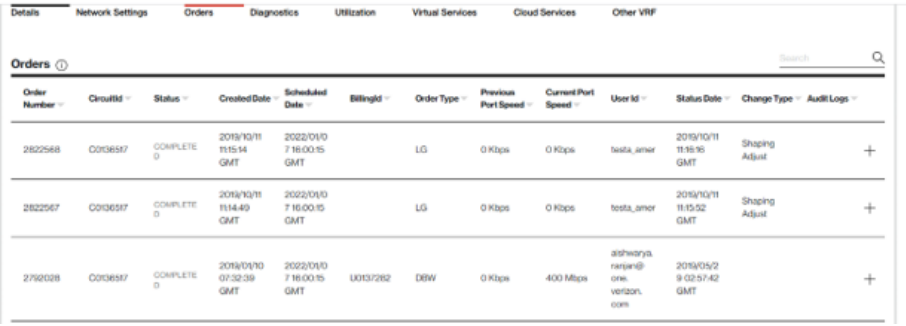
The configuration steps are also explicit to Cisco switch stages (for customer managed circuits). For other merchant CPE, consult the client manual with respect to changing the lining parameters. CBWFQ is typical for Silver CAR and LLQ/Priority Queuing is typical for Gold CAR. We prescribe setting up 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 the 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 time-outs 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

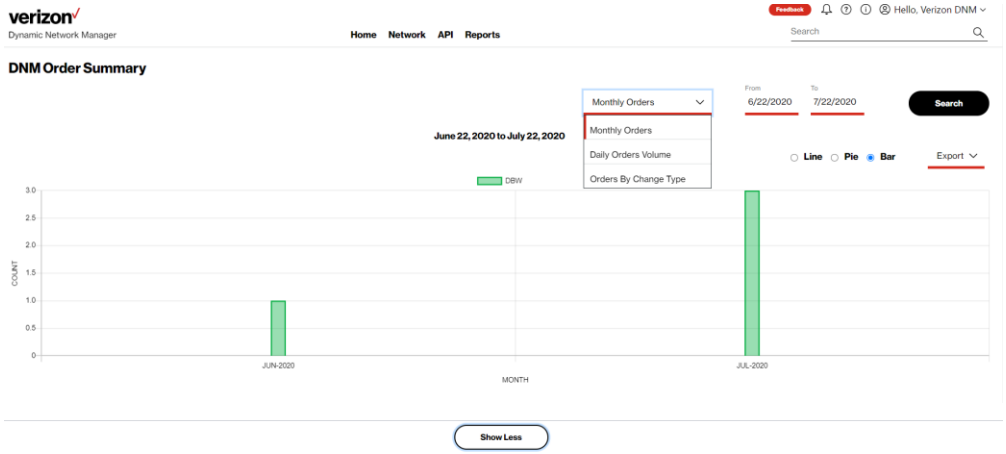
viewed.

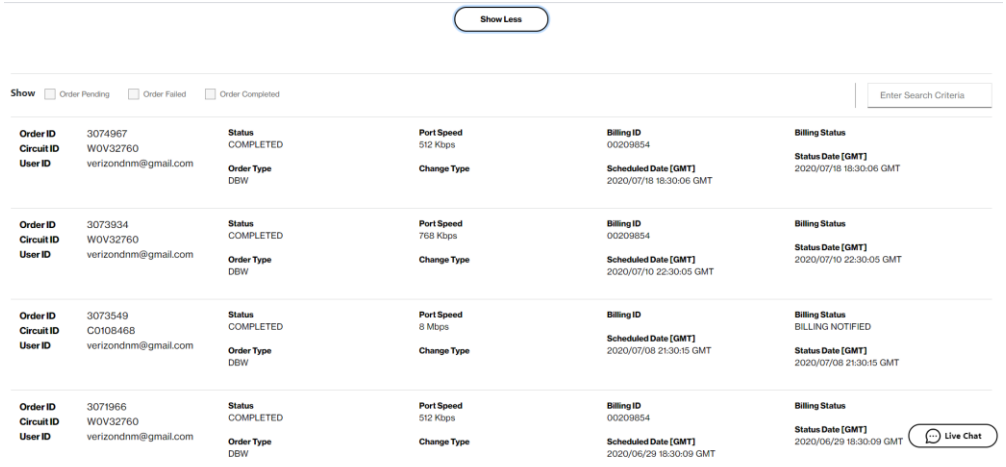


DNM order summary

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.


verizon
Dynamic Network Manager
Feedback
Hello, Verizon DNM
Home
Network
API
Reports
Search
Private IP
DNM Order Summary
Network Transit Delay
Public IP
View All
SCI
SCI Consumption
Ethernet
View All
Miscellaneous
Port Availability
Auto Activation Report


verizon
Dynamic Network Manager
Feedback
Hello, Verizon DNM
Home
Network
API
Reports
Search
DNM Order Summary
Monthly Orders
From
6/22/2020
To
7/22/2020
Search
June 22, 2020 to July 22, 2020
Monthly Orders
Daily Orders Volume
Orders By Change Type
Line
Pie
Bar
Export
DBW
COUNT
3.0
2.5
2.0
1.5
1.0
0.5
0
JUN-2020
JUL-2020
MONTH


Show
Order Pending
Order Failed
Order Completed
Enter Search Criteria
Show Less
Order ID 3074967
Circuit ID W0V32760
User ID 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
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Port Speed 768 Kbps
Change Type
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Billing Status
Status Date [GMT] 2020/07/10 22:30:05 GMT
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Order Type DBW
Port Speed 8 Mbps
Change Type
Billing ID
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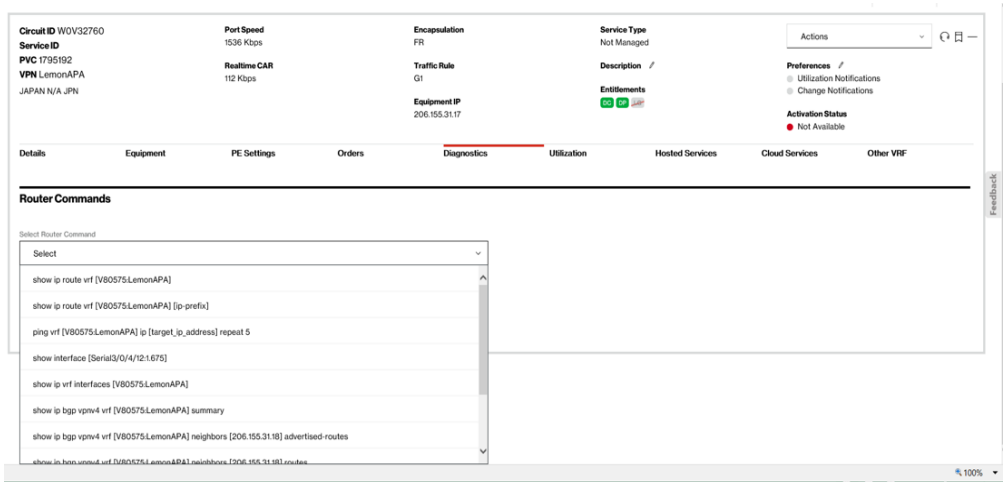
Order Type DBW
Port Speed 512 Kbps
Change Type
Billing ID 00209854
Scheduled Date [GMT] 2020/06/29 18:30:09 GMT
Billing Status
Status Date [GMT] 2020/06/29 18:30:09 GMT
Live Chat

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.



Ethernet Access pre activation test (US only)

Users can issue an Ethernet Access test prior to activating the circuit.

If all the below conditions are satisfied DNM allows the Ethernet Access Test and will display the Ethernet Access Test Results tab.

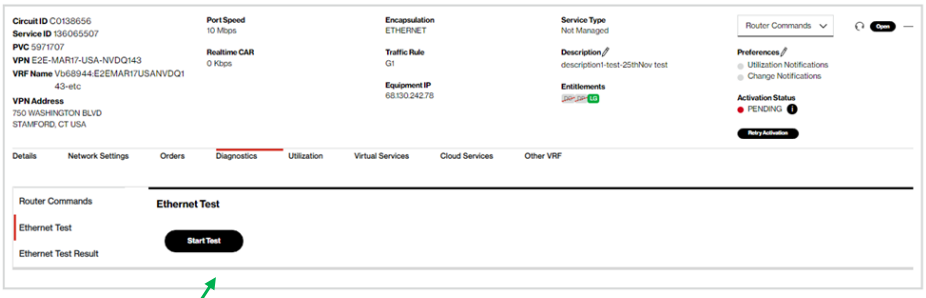
Conditions:

- Encapsulation must be Ethernet
- Region must be US domestic Circuit
- Port Speed must be less than or equal to 1GB
- Circuit Activation Status cannot be active

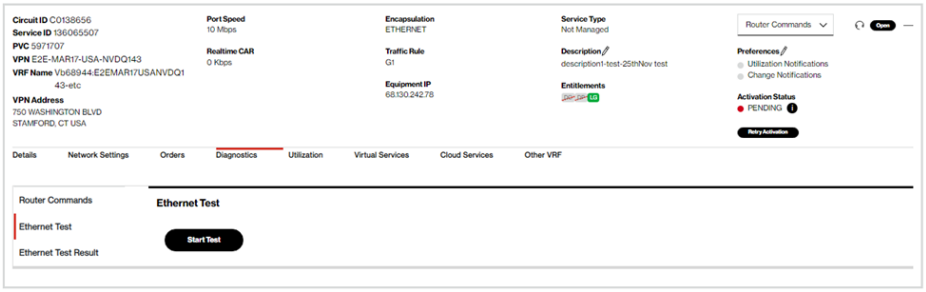
Submission of the Test Steps:

1. Click Router Commands under Site Details. The Router Commands section appears above Site Details.
2. Select the Ethernet Test from the Router Command drop-down list.
3. Initiate the Test.

Ethernet test tab

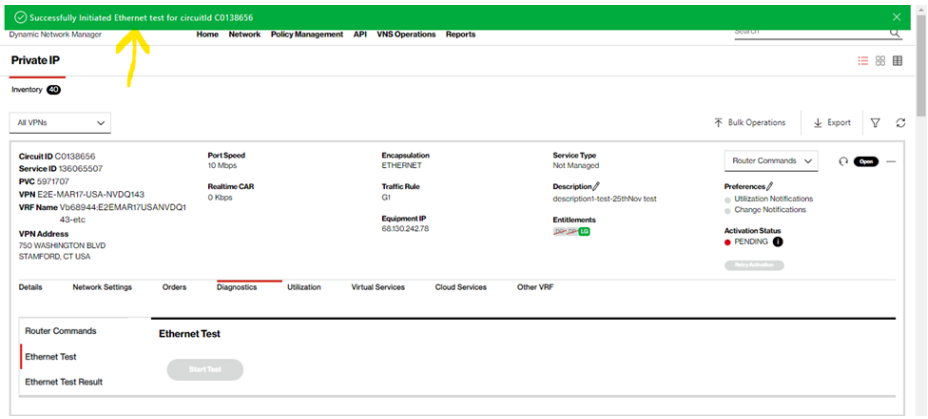


Click Start Test.



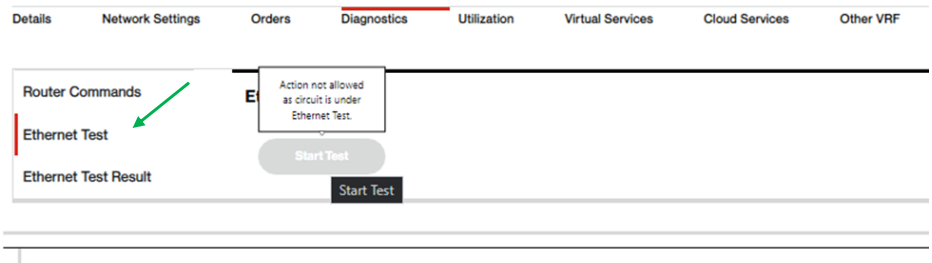
Click Continue, after Confirmation.

Green Bar will appear which states the Ethernet Access Test was successfully submitted.



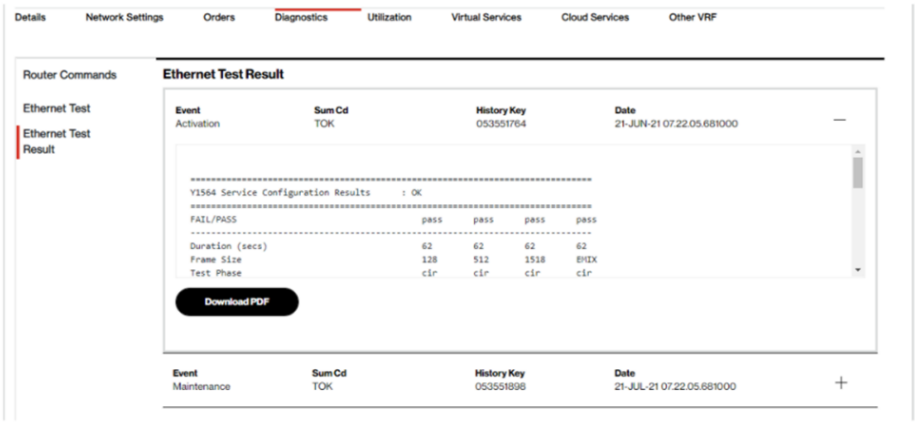
After Ethernet test is completed

1. Ethernet test results option will appear.
2. Click Ethernet Test Result.



Response from Test

Ethernet Access Test Results

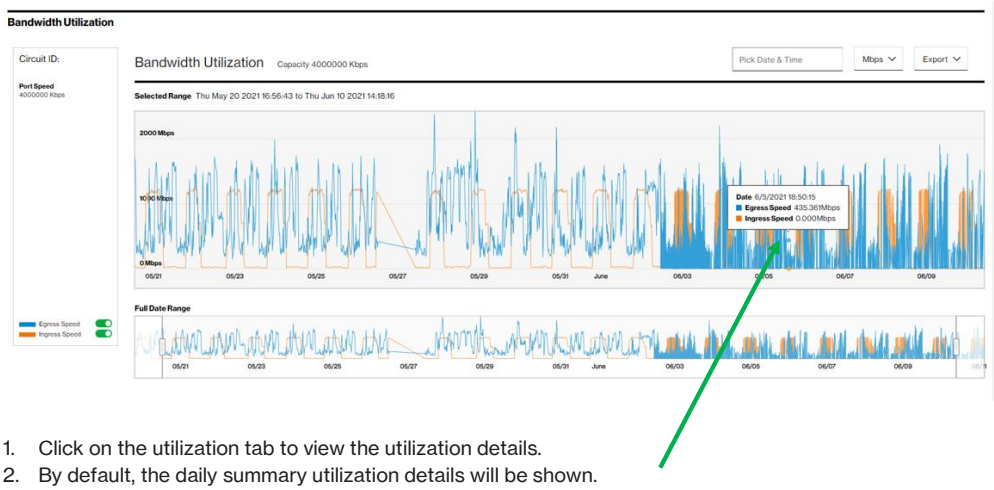


Bandwidth utilization

Utilization report will be displayed for the last 30 days. In addition, users have an option to view bandwidth utilization reports with specific date ranges for the last 12 months. This new feature is available as of January 2022.

Click on the Utilization tab.

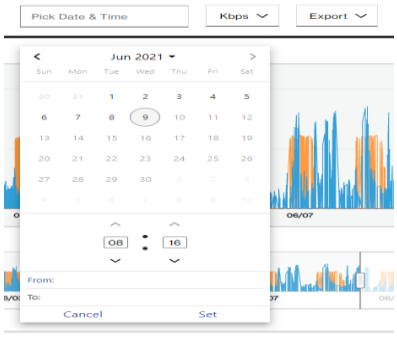
The example below shows received and transmitted results for the Verizon Provider Edge (PE) port. Ingress/Received is what Verizon receives from a customer, and Egress/Transmitted is what Verizon sends to a customer. If you were to view the Customer Equipment (CE) port then you would see the opposite measurements. Verizon PE port measurements and CE port Measurements should closely match.



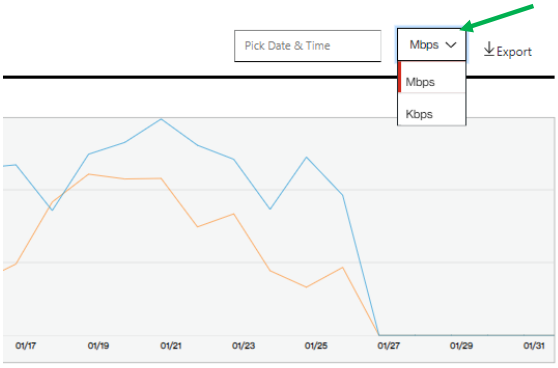
1. Click on the utilization tab to view the utilization details.
2. By default, the daily summary utilization details will be shown.
3. To view 15 min interval usage, select and drag to specific duration so that 15 mins interval usage duration can be viewed.
4. Use the toggle buttons next to egress and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

There are different options you can change on the utilization reports page.

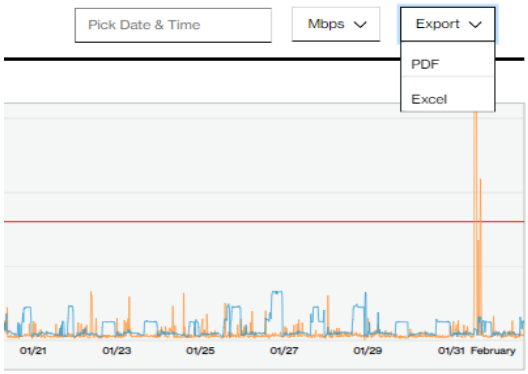
You can change the date range for the utilization reports by selecting the “Pick Date & Time” option, then select your date range from 1 day to 30 days.



You can change the display of stats from Kbps to Mbps.



You can export the report to PDF or excel spreadsheet by selecting the option in the drop down.



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 order**s** to see the status of the ticket on the separate page.

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 - Replace 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 affected -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 manually-configured 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 VERIZON ENTERPRISE CENTER 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: After you submit a port speed change, check the order to ensure it was successful and did not fail. Refer to the Order failure section on how to resolve order failures.

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 0K, 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 0K 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.

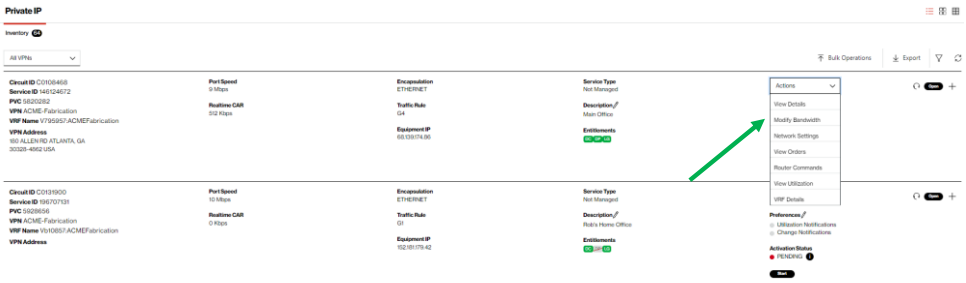
- The default egress policy for all Private IP customers is: EF: 50%, AF4: 40%, AF3: 39%, AF2: 16%, AF1: 1%, BE: 4%. This means on egress, up to 50% of the port will be dedicated to the EF class of service. Anything which exceeds 50% on egress is discarded. While a User can still use the port for other 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 the Appendix section.

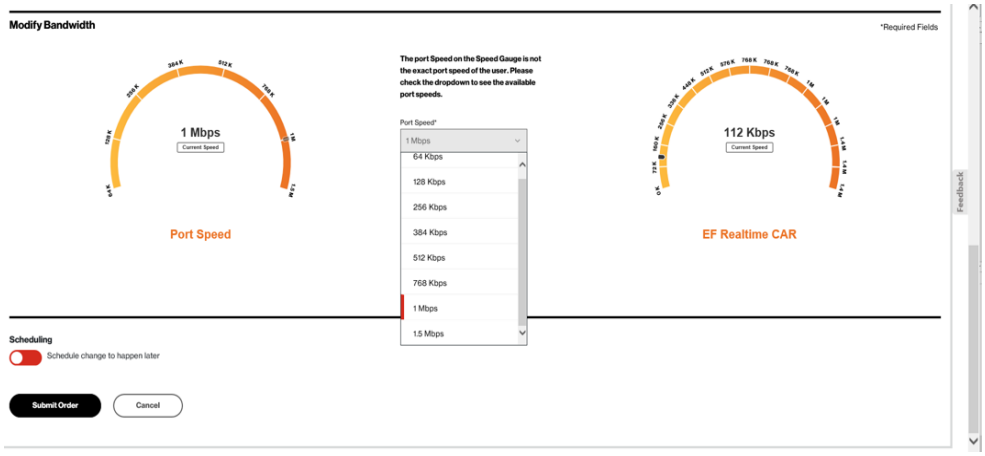
How to modify port bandwidth and EF CAR

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



NOTE: Please ensure you verify that the Bandwidth change order was successful. Refer to the failure section on how to resolve order failures.

Dynamic Port Speed Menu example:

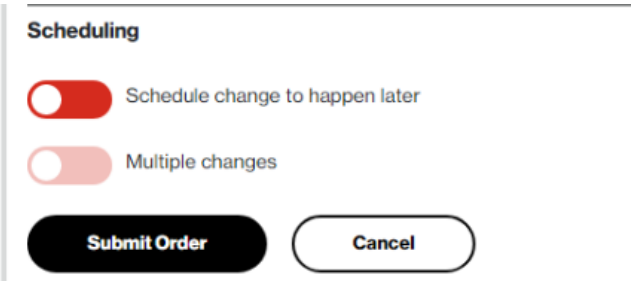


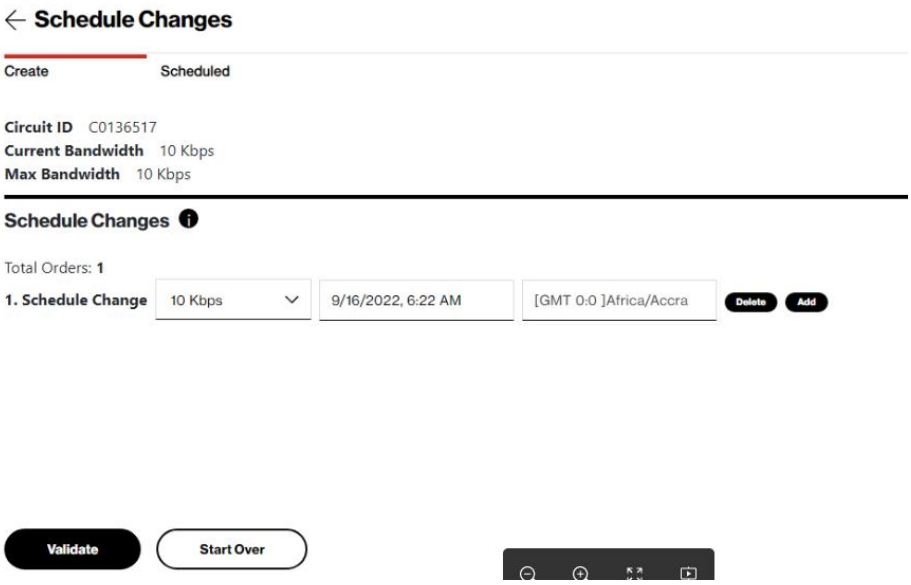
Scheduler: Users may optionally schedule Port/CAR changes out to a year in advance for Unmanaged circuits only. **Managed circuits cannot** use the scheduling option at this time. Multiple changes can be scheduled for the future as shown below: below.

To schedule future changes, either:

- Click on the Schedule change to happen later toggle for one transaction

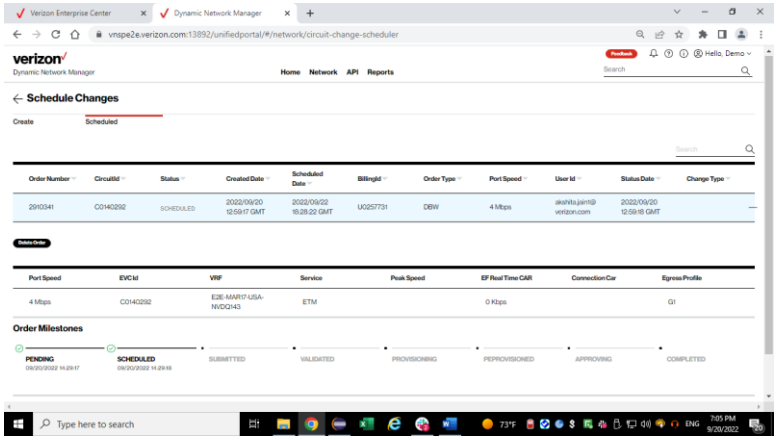
  Or
- Click on Multiple changes toggle to Add 2 to many changes up to 12 months in advance



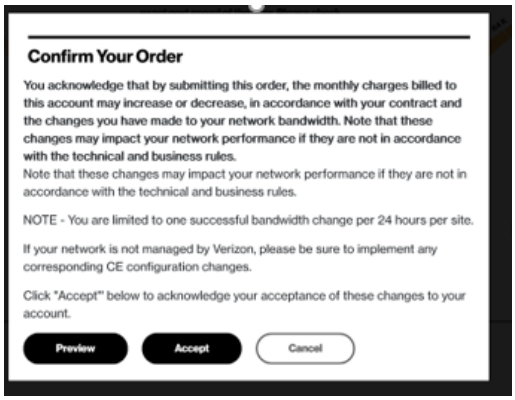


DNM will allow the user to “Add” one to many changes. Once the changes are added, click on the Validate button. DNM will ensure the changes will pass change rules. The dates must be entered in chronological order otherwise we will be raised with error while validating.

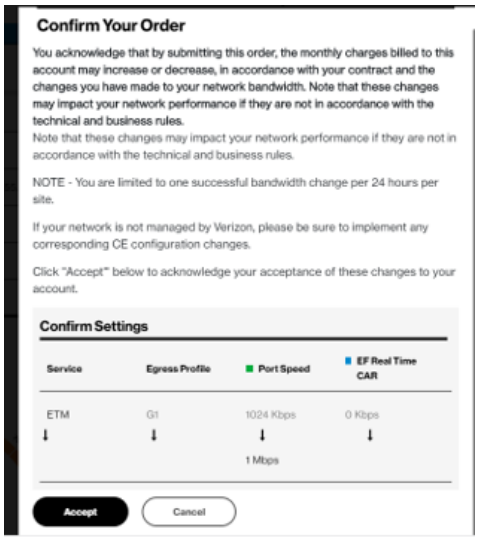
Jobs created will be reflected in scheduled tab

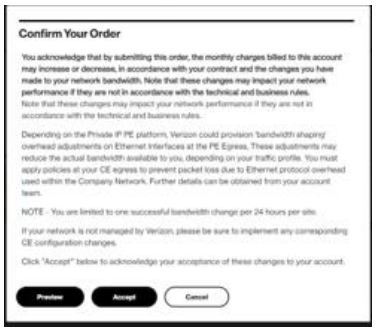


Order confirmation pop-up



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





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.

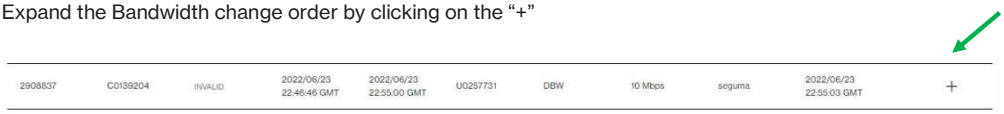
Note for Private IP Ethernet Ports with a prefix of B or C**.**

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.

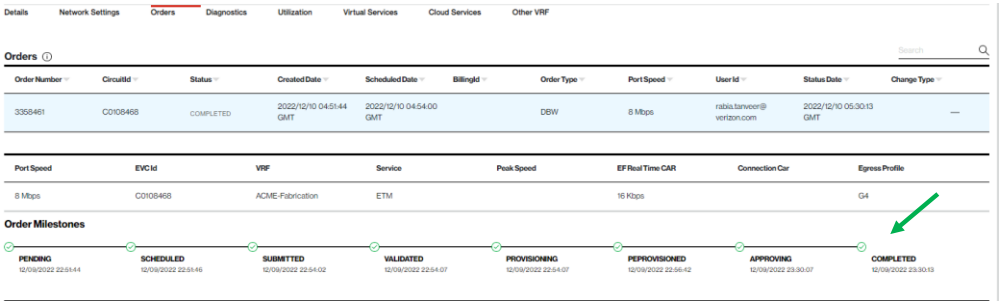
Order failures

DPort orders can fail due to different issues within the customers network provisioning. Once an order is submitted, return back to DNM and verify that the order was successful. This can be done by viewing the order summary or the order history. The steps below will provide the option to gain support with an order failure.

Expand the Bandwidth change order by clicking on the “+”

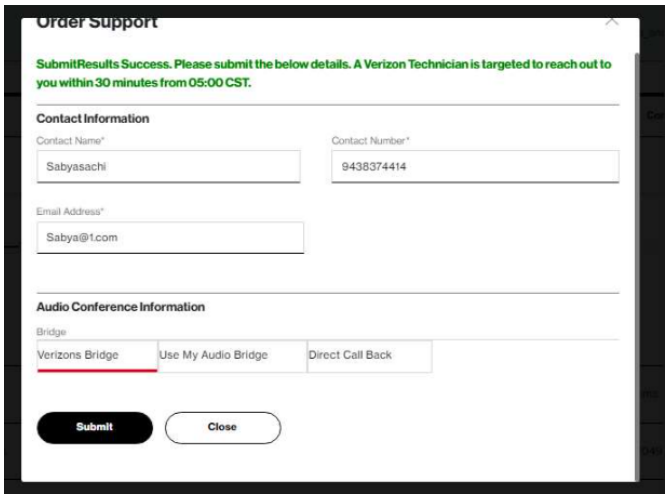


The tool will display the order milestones and provide each step as it is implemented and passed.



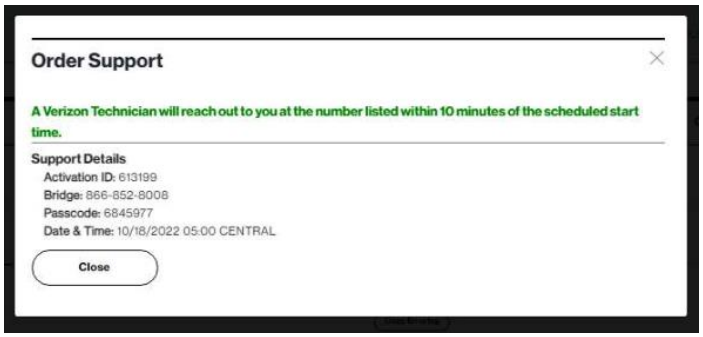
If the order fails, the tool will display the “failed” next to the step and provide you with an Order Support button

When you click on Order support button, tool will display:



Complete the fields so the DNM technical support person can contact you to resolve the issues.

Click submit.



DNM technical support will contact you back within 10 minutes of the scheduled start time.

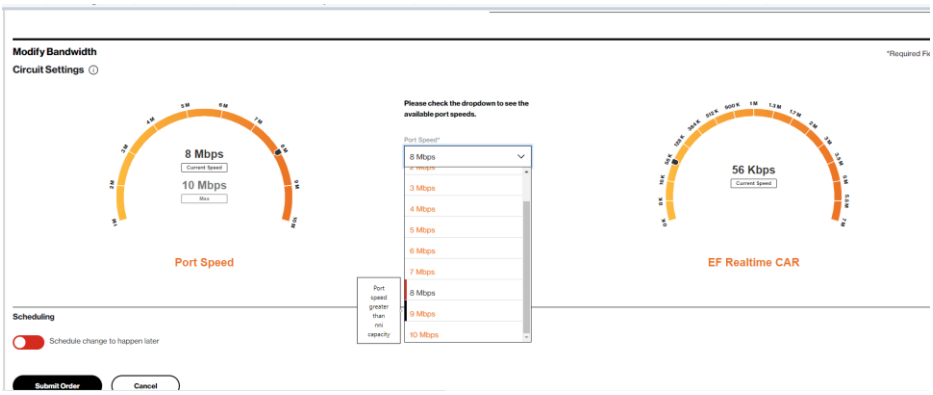
Network to Network Interface (NNI) Toggling for DPORT Change

NNI Toggling allows customers the ability to change the bandwidth on a circuit and if the NNI does not contain enough bandwidth for the change, it will automatically move to an alternate NNI, if one is available. This allows the customer to submit the Dynamic Port (DPort) transaction instead of requiring a standard order via Account Team. If there is no alternate NNI, then the change will have to be made with a standard change order via your account / support team.

NOTE: This is only available to US Domestic Commercial customers at this time making changes to US domestic sites only. International site changes are not supported yet.

When NNI Toggling is enabled (see the screenshot below), the new message will display next to bandwidths and will highlight the specific bandwidths that exceed the current NNI bandwidth. The “red” bar (next to the speed) represents the current NNI speed, while the “black” bar represents the speeds that exceed the NNI bandwidth.

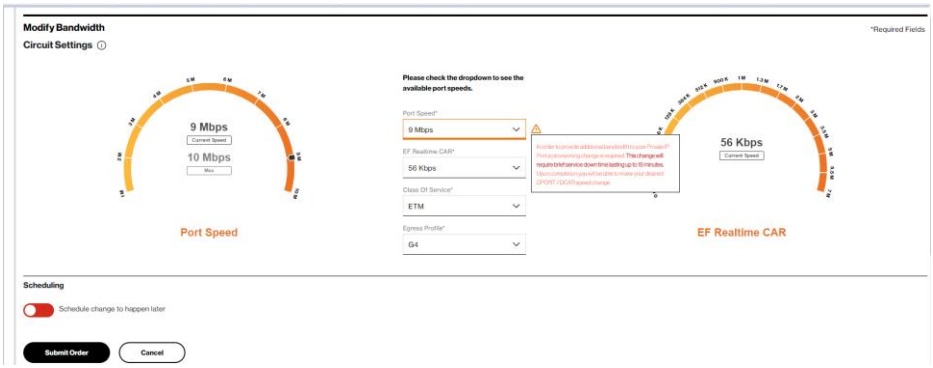
In the screenshot below, you can see that the Current Bandwidth is at 8Mbps. If a Port change was made to 9Mbps, it would trigger the NNI move, if there is an alternative available with 9Mbps of capacity.



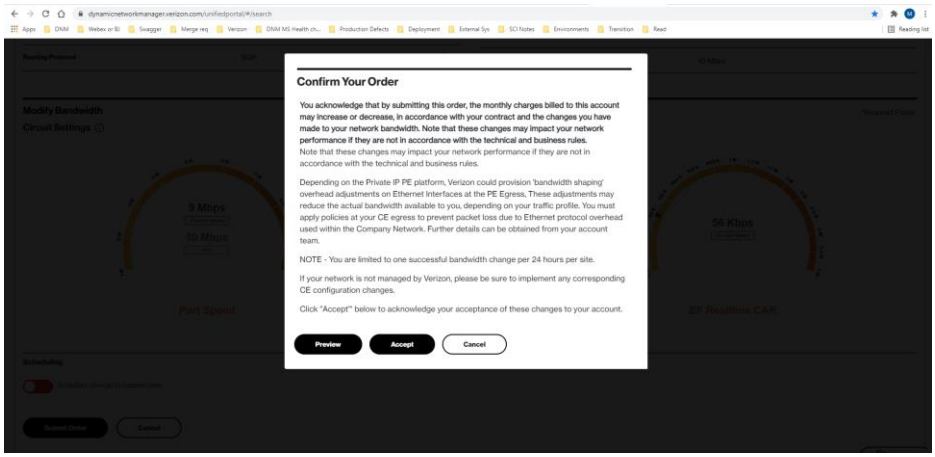
When a User selects a speed that is greater than NNI Capacity + Current Port Speed then a (see screenshot below) message will appear next to the bandwidth selected. This notifies the user that the selected bandwidth change will place a "hot cut" order which will bring down the network for an approximate 15 minutes. During this down time, the system is automatically moving the circuit from one NNI to another NNI that has enough bandwidth for the DPort change.

If there is no alternative NNI with enough bandwidth then the transaction will fail, (back out the bandwidth change) and the user will need to contact their Account Team / Support Team to submit a standard order.

In the example below, the user selected a bandwidth of 9 Mbps, which exceeds the NNI capacity. You can see the message that is displayed to notify the user of NNI toggle change, if they continue to submit the order, the NNI change will trigger a move from one NNI to another that has enough bandwidth. At this point they can continue with the change or change the port speed to a lower value.



Confirmation window of the transaction will be provided. You will need to accept the terms to submit the order. Ensure you come back and verify that the order successfully completed.

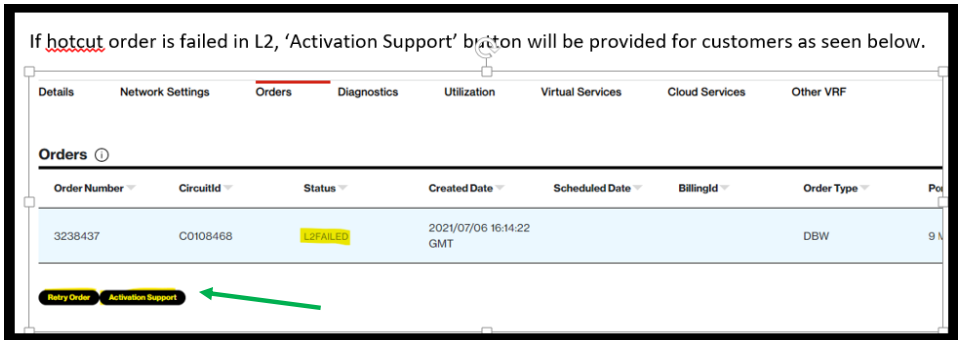


If the Bandwidth order fails

Users will need to go in and review the order status for the specific change. That change order will display on the order status field:

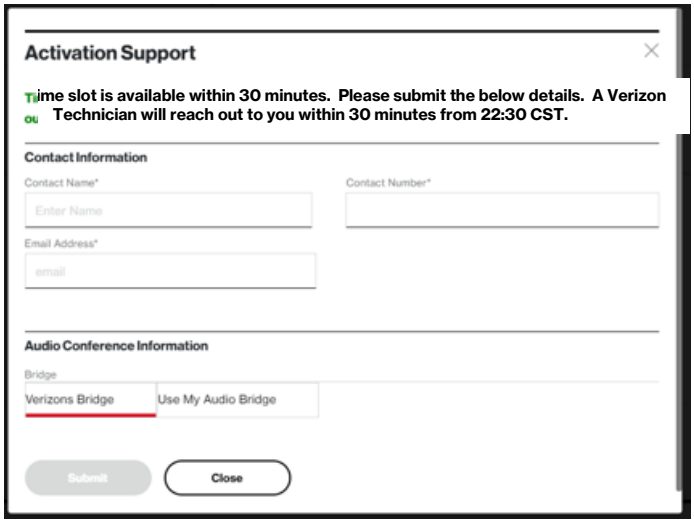
"Layer 2 provisioning failed."

Click on that "Activation Support" button. This will trigger the Support team to begin work to resolve the issue as quickly as possible. They will at a minimum roll the bandwidth change back to bring the network back up.



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

The Support Team for US Commercial customers, are available 7 days a week 24 hours a day to support the requests.

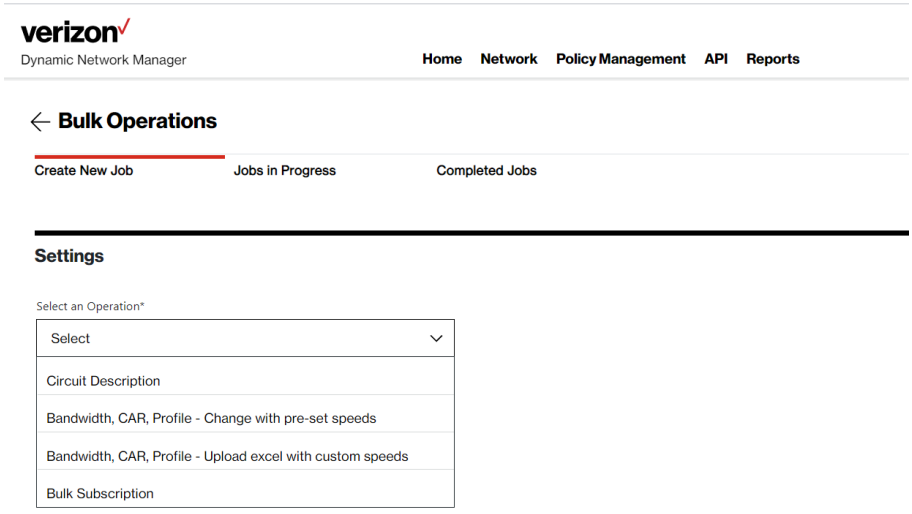


Bulk operations

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).

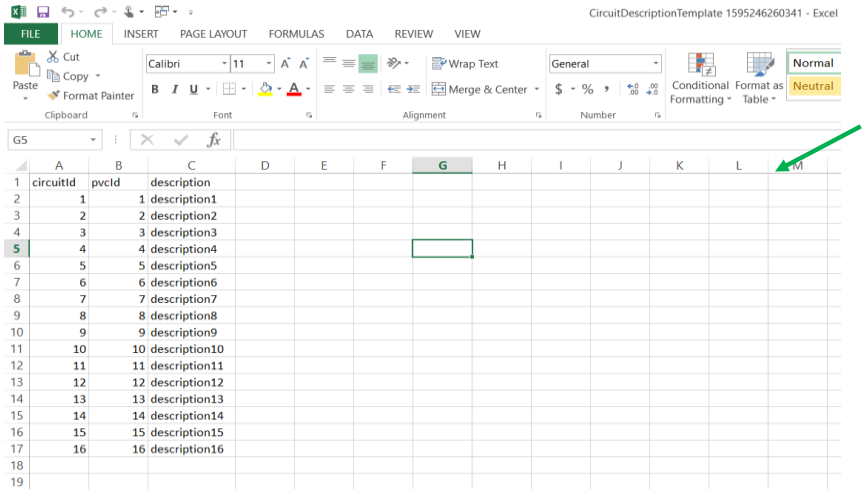
Please note that only Private IP single VRF (virtual route forwarding) and PORT Multi-VRF circuits are supported for Bulk speed changes currently. PVC Multi-VRF circuit support is targeted for 4Q20.

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.*

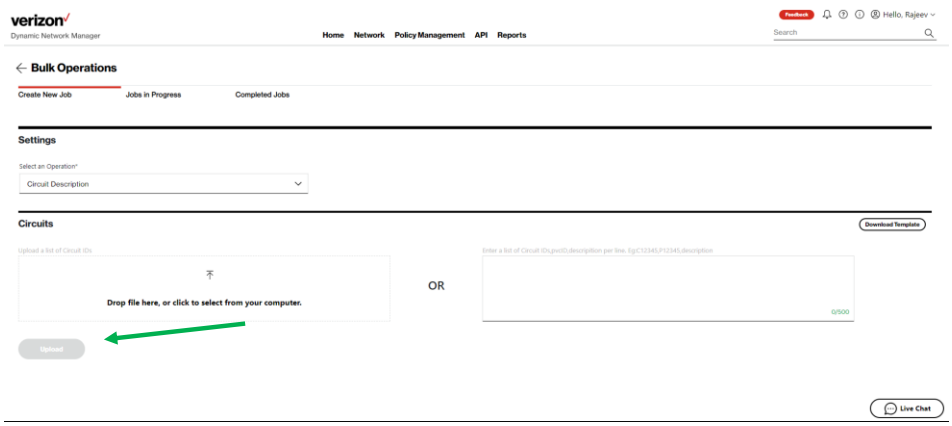


Circuit Description

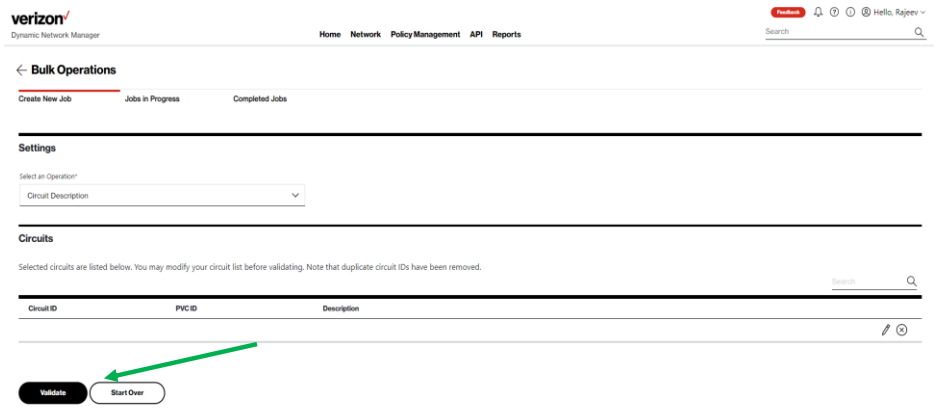
This option allows changes to Circuit Descriptions (only). You can manually enter circuit information or enter it into a DNM spreadsheet template.



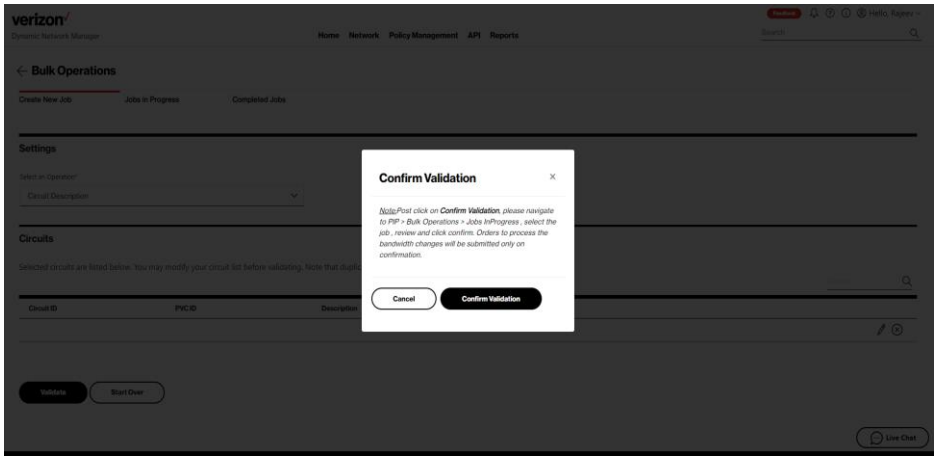
Note: Circuit information submitted via spreadsheet for any DNM bulk change request must be entered in a DNM spreadsheet template format. If data does not match the Template format provided, the sheet will not be uploaded.



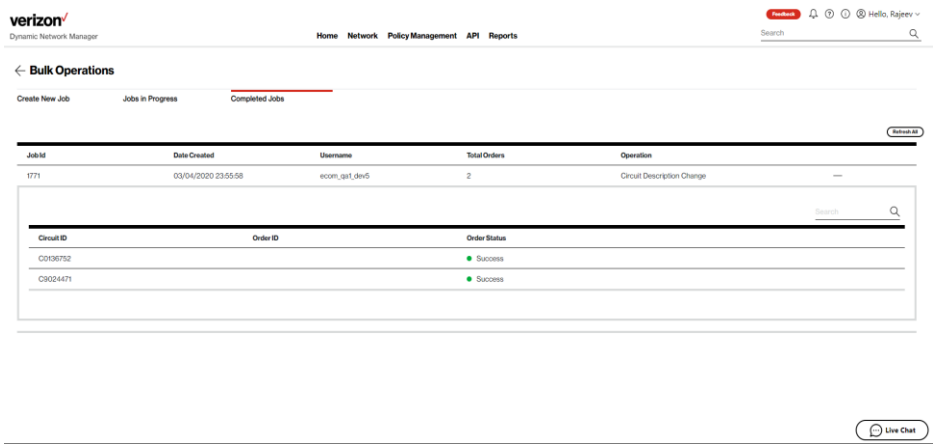
After the Excel file (or your manually entered list) has been entered, Click Upload.



Live Chat Click **Validate**

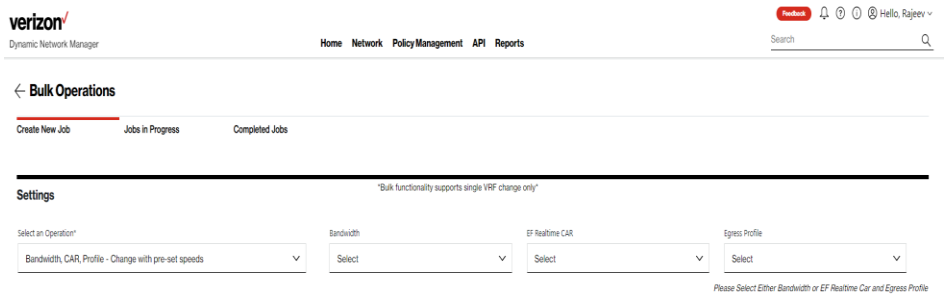


Click Confirm Validation.

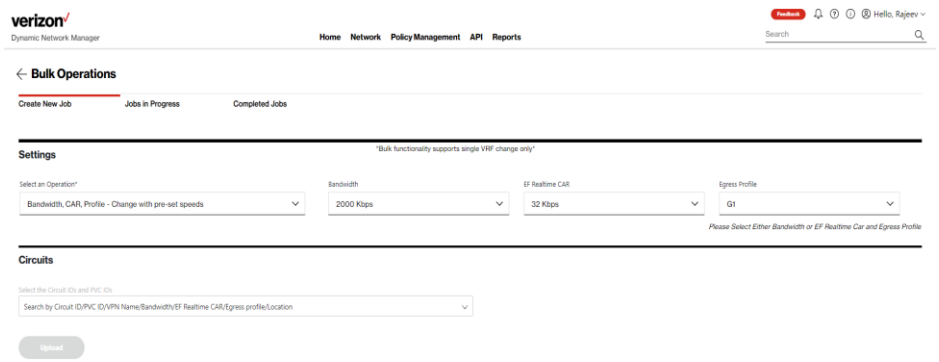


Completed Tab displays the jobs that have been processed.

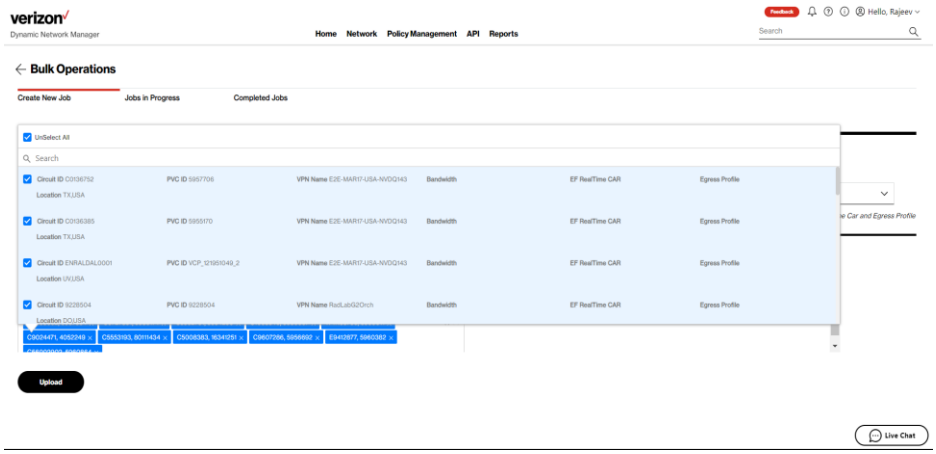
Bandwidth, CAR, profile – change with preset speeds



Enter Bandwidth, CAR and Profile selections in drop down menus.

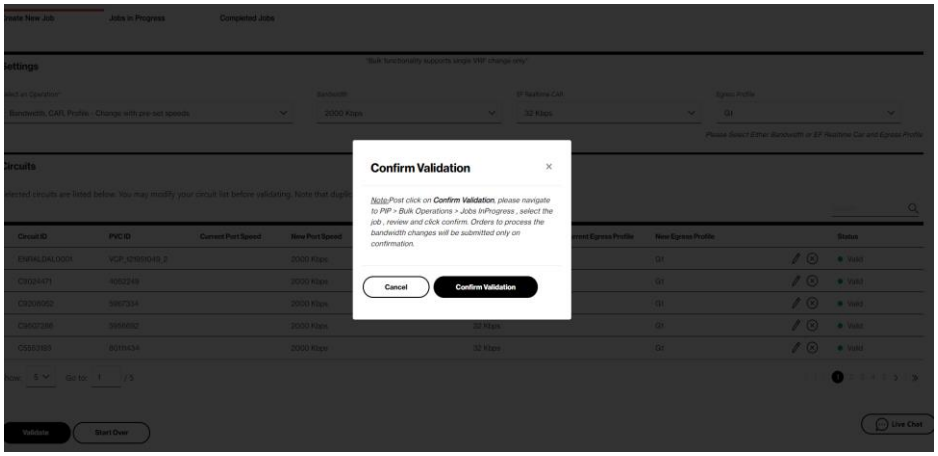


Click the Circuits bar to search & select circuits for Bulk changes.



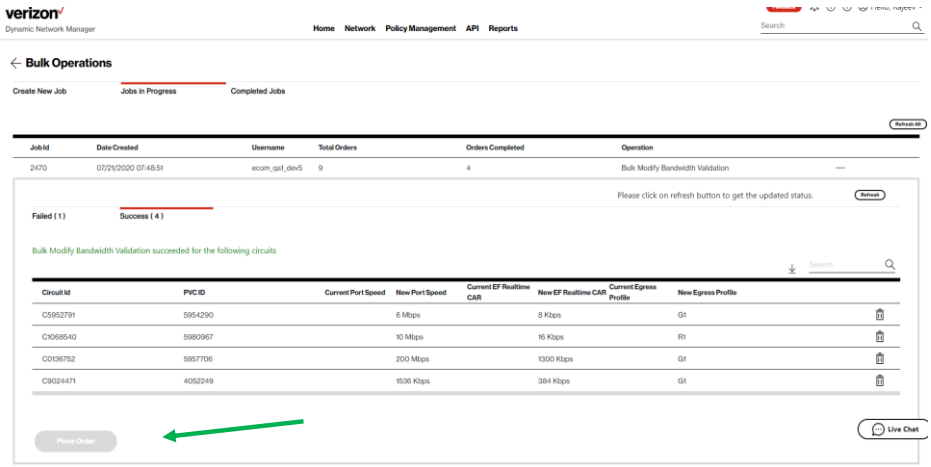
Click Upload to submit circuits for Bulk Changes.

Click Validate.



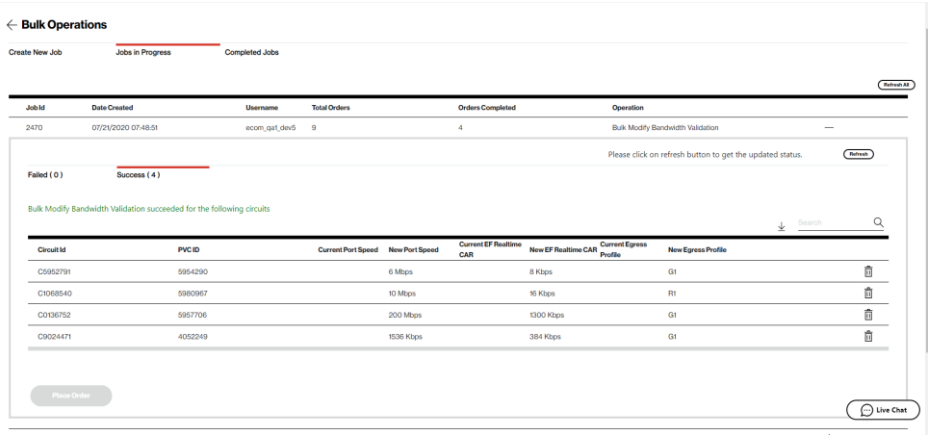
Click Confirm Validation.

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).



Click Place Order once Revalidation is complete.

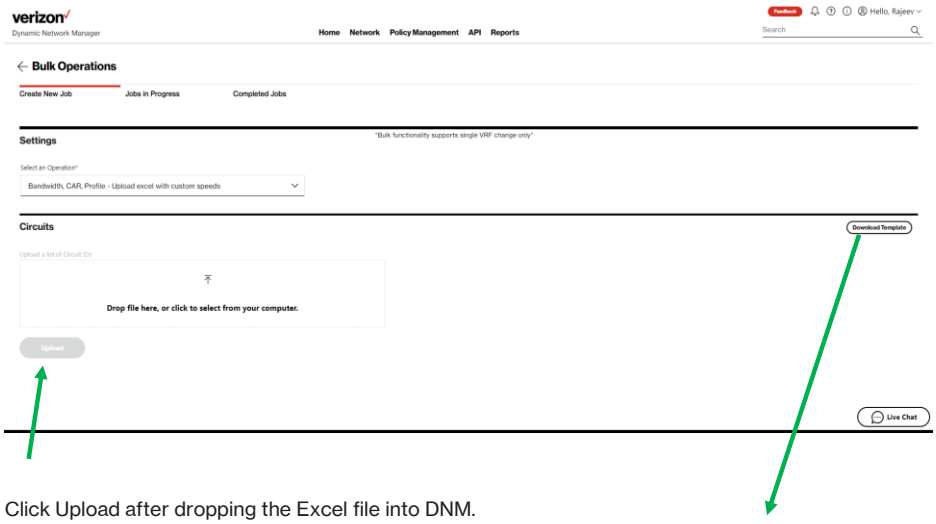
This is the final step to entering the bulk change request.



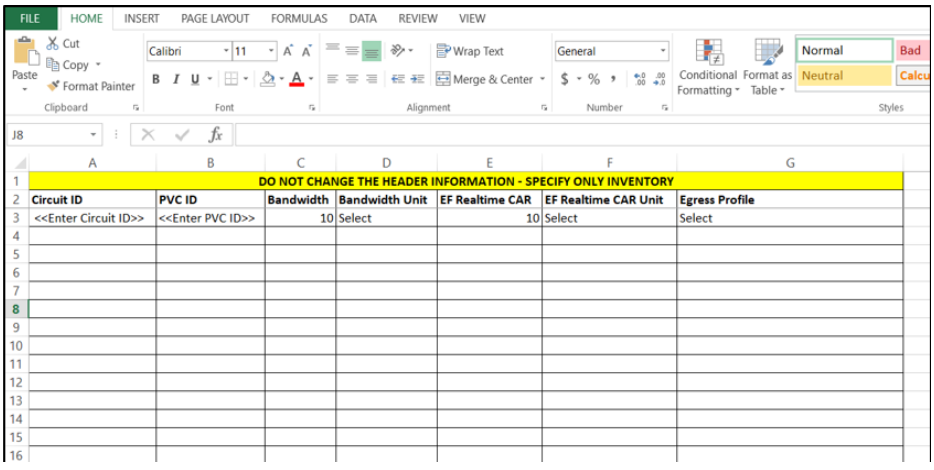
Success tab shows circuits that have been successfully submitted.

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.

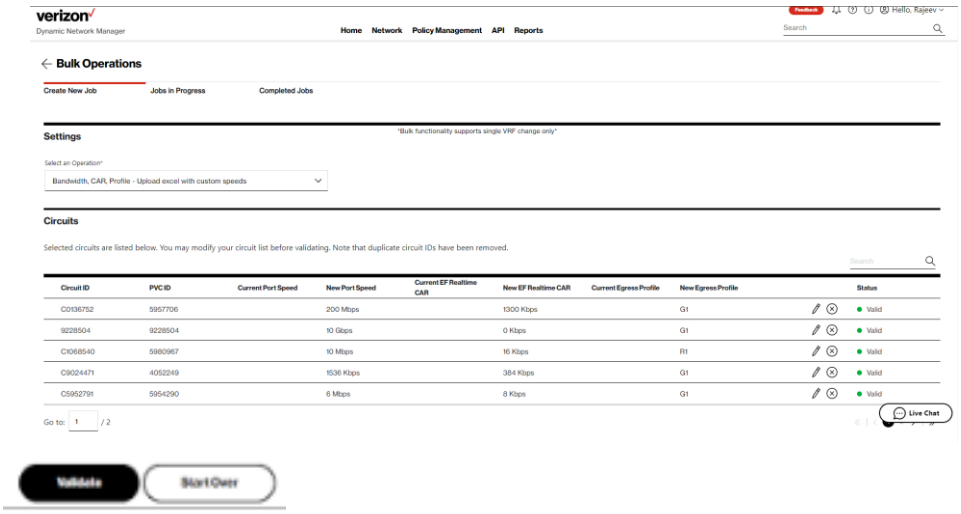


Click Upload after dropping the Excel file into DNM.

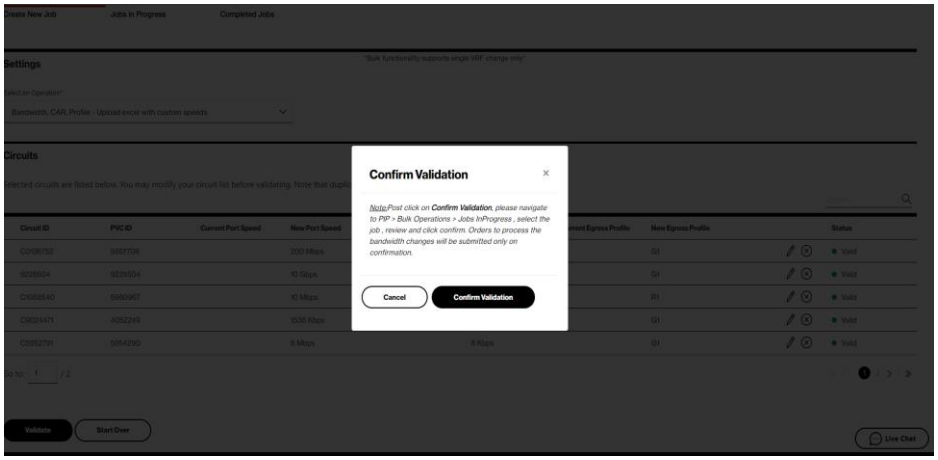


DNM speed change template

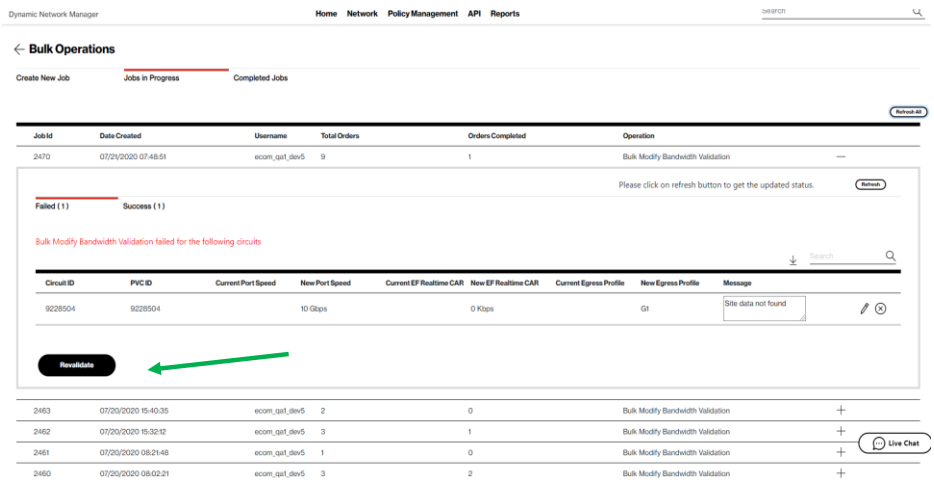
Commented [BAM1]: Need a new picture



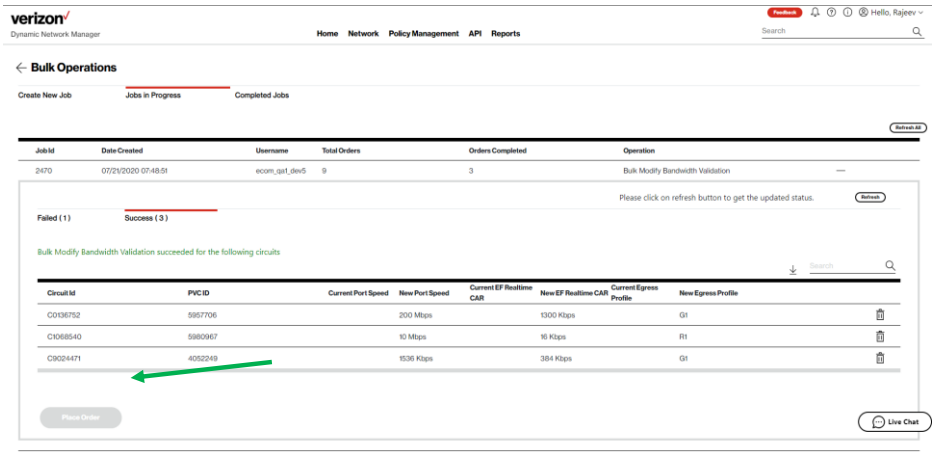
When finished editing, click Validate.



Click Confirm Validate.



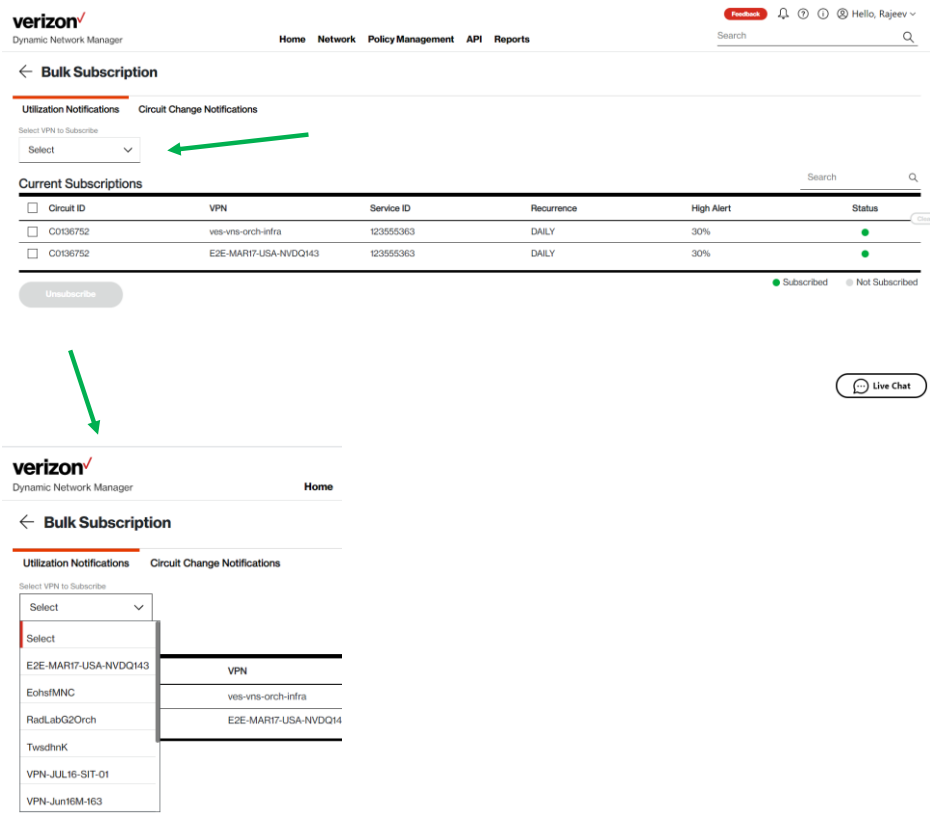
Important Note: DNM will send you an email confirmation when all submitted circuits are processed after the Confirm Validation step. If, however, you go to the Jobs in Progress tab to review status before receiving the DNM email, then hit Refresh to see the most current list of validated circuits (or 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).

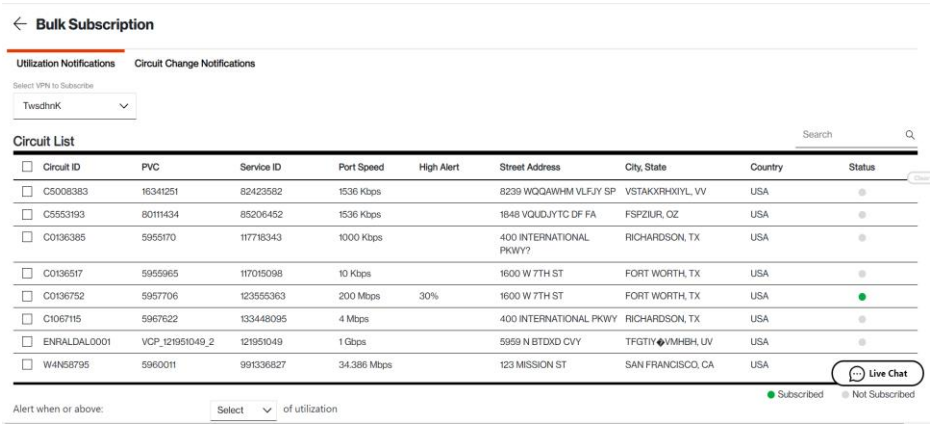


Click Place Order once Revalidation is complete.
This is the final step to entering the Bulk change request.

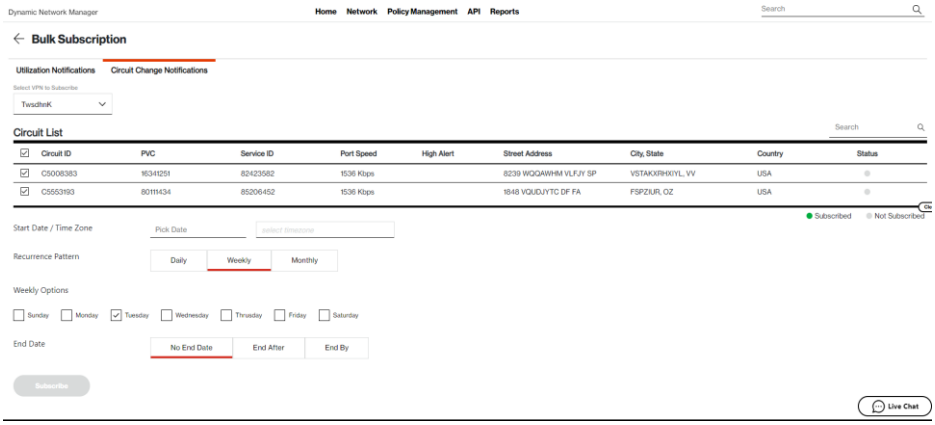
Bulk subscriptions

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.





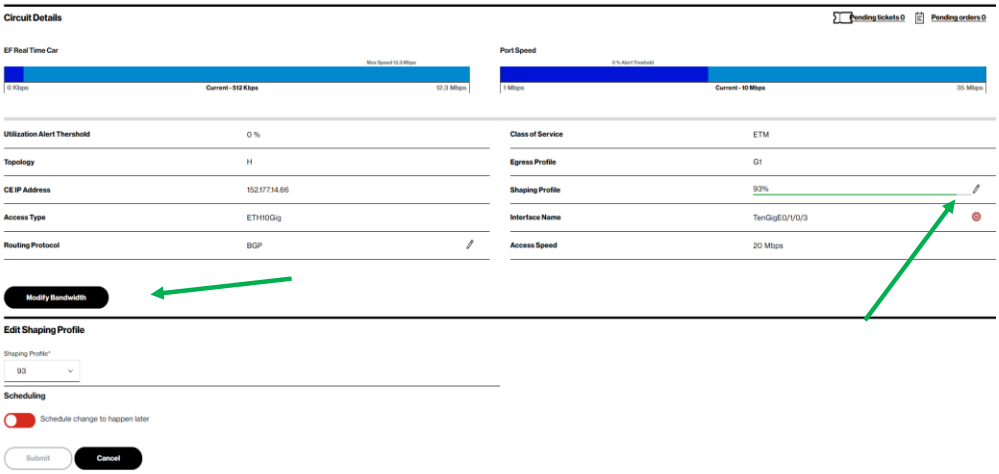
Select one or all listed circuits to submit for Alerts/Notifications subscription.



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, and Start Frame Delimiter (SFD). When dealing with small frames, this overhead could be considerable. The marketed 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, and data).



Click on shaping profile in the details tab. The Modify Shaping Adjustment for Ethernet Overhead section appears above the Site Details.

Select 76, 85, or 94 from the Shape PE departure data transmission to drop-down rundown.

Enter a Process Date/Time to plan this activity, if relevant.

Select a period zone starting from the drop list.

Click Schedule Order on the off chance that you are booking this for a future date.

Click Process Order to present your request. The Process Order Confirmation spring up shows up.

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.

Click Print to print a duplicate of your solicitation.

Modify Admin Status

Click  next to Interface Name in the *Site Details*. The *Modify Admin Status* section appears above the *Site Details.*

Enter a *Process Date/Time* to schedule this job, if applicable.

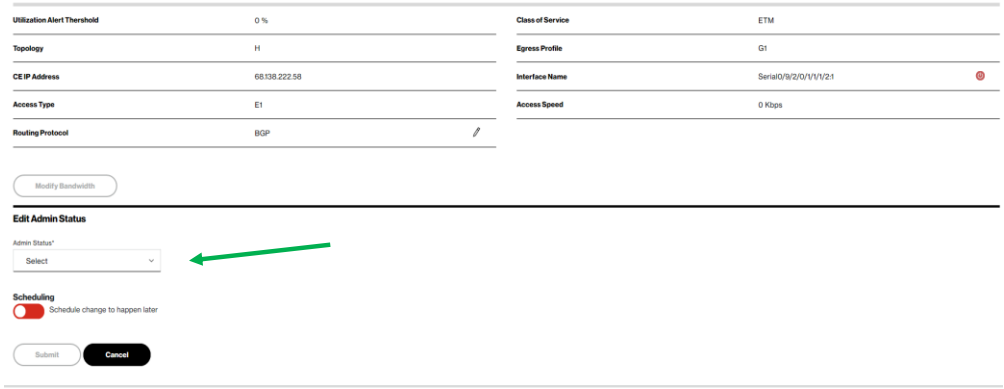
Select a time zone from the drop-down list.

Click Schedule Order if you are scheduling this for a future date.

Select no-shutdown or shutdown from the *New Admin Status* drop-down list.

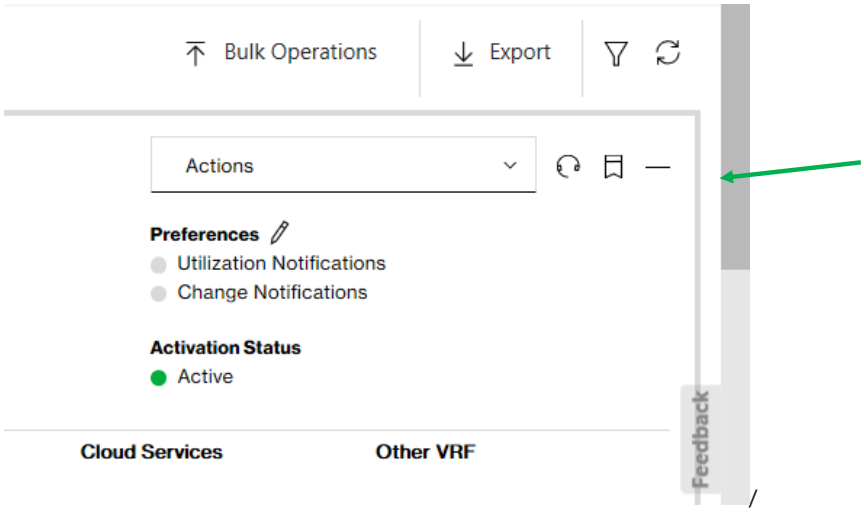
Click Process Order to submit your order. The *Process Order Confirmation* pop-up appears.

Click Accept.



Open Quick (Trouble) Ticket

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

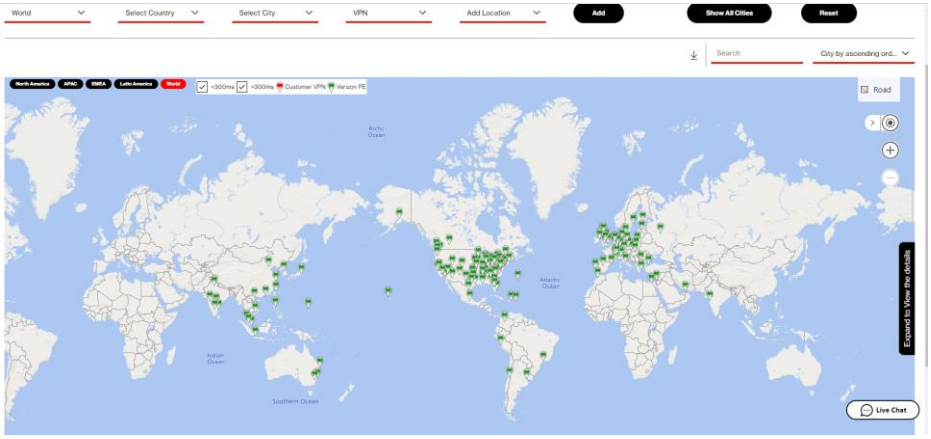


When you open a ticket, the circuit ID for which you are viewing in the *Site Details* automatically populates. Enter a different circuit ID, if applicable.

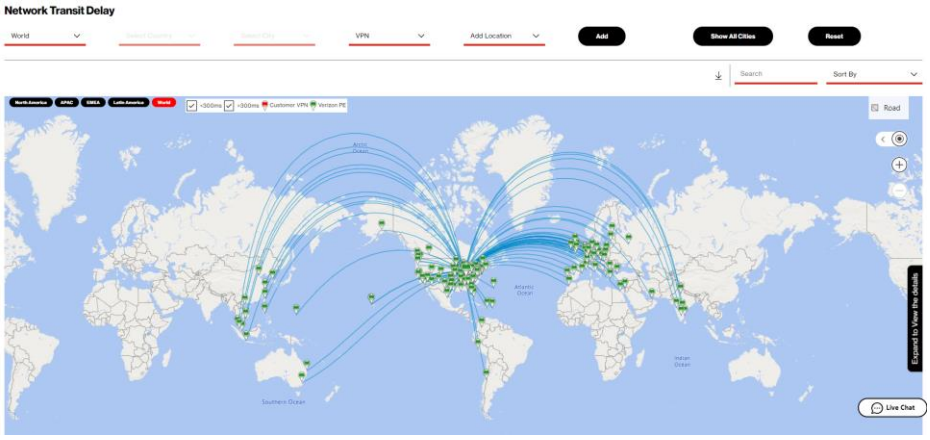
Click Next to verify service and enter the ticket information.

Network Transit Delay

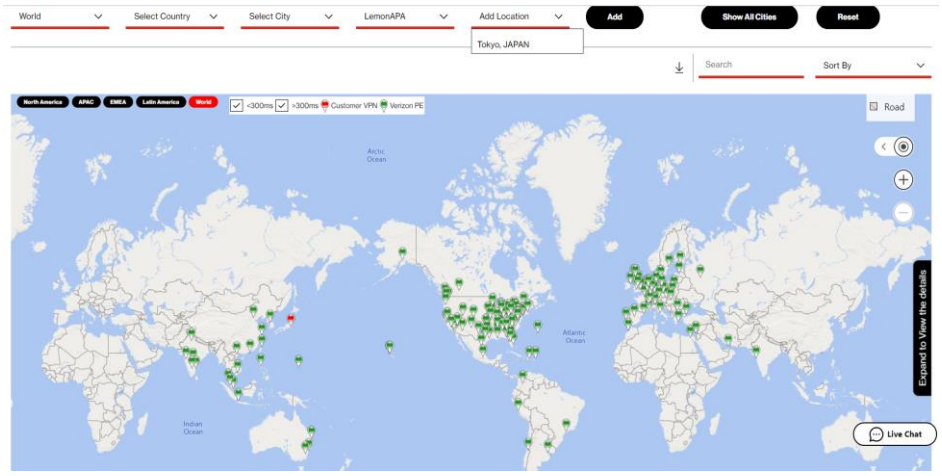
This section displays Verizon metrics for Network Transit Delay (Latency) between Private IP PE (provider edge) devices. This is not a report but rather a listing of those metrics. You can see what Verizon's Service Level Agreements (SLA) Latency metrics are between the selected sites.



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.



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	4	39	1	1	4	Default profile – balanced allocation
2	_G2	50	4	20	1	1	4	Video-centric #1
3	_G3	50	6	12%	1	8	2	Video-centric #2
4	_G4	50	1	20	2	1	4	Data-centric with emphasis on bulk-transfer applications
5	_G5	50	1	60	6	1	4	Data-centric with emphasis on transactional applications
6	_G6	50	1	40	4	1	4	Data-centric with balanced bulk-transfer and transactional applications

Profile #	Profile Identifier	EF Egress	AF4	AF3	AF2	AF1	BE	Comments
7	_G7	50	1	30	1	5	3	Data-centric with large percentage of unmarked (BE-marked) applications and bulk-transfer applications
8	_G8	50	3	10%	1	5	2	Balanced QoS w/ ample video for a 384K video on a T1
9	_G9	50	2	30	3	1	5	Data-centric w/ balanced applications (matches HSBC policy)
10	_G10	50	1	20	2	5	4	Data-centric with large percentage of unmarked (BE-marked) applications and transactional applications
11	_G11	50	3	20	2	1	2	Data centric with balanced allocation
12	_G12	50	6	5%	1	5	2	Video centric/minimum control traffic
13	_G13	50	1	40	3	5	1	Data balanced apps #2
14	_G14	50	2	25	2	1	2	Data balanced AF3/AF2 centric
15	_G15	50	2	10%	2	4	1	Data centric with emphasis on Scavenger/Standard data apps

PIP ETM 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
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 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/Standard Data Apps

Customer Edge (CE) 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
!
!
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 10000000 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 FastEthernet0/0
   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 to 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
MTU	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 Verizon Enterprise Center.

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- U.S. Call 1.800.569-8799 (M-F 9 AM – 6 PM ET).
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- EMEA Customers: 00 800 4321 5432.
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