



SPILOVER LOAD- BALANCING / BANDWIDTH

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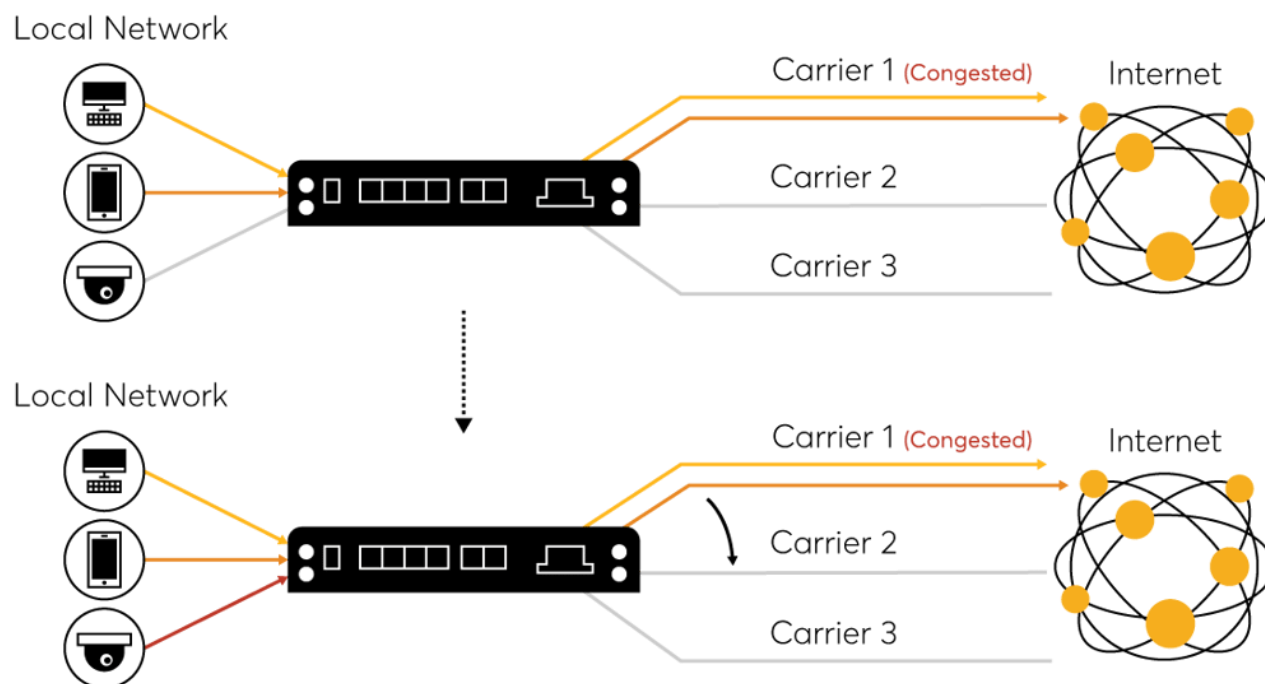


SPILLOVER LOAD BALNCING / BANDWIDTH

Note: This support is available from firmware version 23.13.1 and above. This is applicable to NG NGFW (Next-Gen Firewall) , NG SHG (Secure HotSPOT Gateway) & NG SAG (Secure Access Gateway) / NG SD-WAN product series. This Solution is only applicable for the location where device having 2 or more ISP links.

Spillover bandwidth is a concept of moving the new connections from a loaded ISP link to the other available link(s) based on bandwidth threshold. In simple words if a location is having 2 ISP links and by setting a threshold on first ISP link for example 10Mbps – the moment the first ISP link reaches 10Mbps of load then the spillover algorithm will kick in and move the next available data traffic to the second ISP link.

As per the spillover load balancing algorithm, the highest priority member is used until bandwidth exceeds ingress and egress thresholds. Additional traffic is then sent through the next- Link.



Spillover Load Balancing reduces the risk of outages and provisions additional bandwidth to relieve potential traffic congestion.



How to configure spillover bandwidth in NG Series?

Being it is a concept there is no separate tab to configure Spillover bandwidth settings, it is part of the Network Settings – **WAN link configuration** & **WLLB configuration** under SDWAN tab.

Please note: The moment spillover bandwidth is opted making active – active of all the ISP link (session-based load balancing is not available)

Pre-requisite:

1. The upload and download bandwidth of available ISP links details required for proper configuration.
2. Out of the 2 or more available links, which will act as primary link and second priority link for failover
3. Time period to cross check the set bandwidth threshold before start using the primary link for new connections (TCP/UDP)

How it works?

1. The maximum bandwidth allowed is configurable in WAN links | W-WAN-3G/4G/5G
2. The averaging of bandwidth threshold is between 1 to 10 minutes and is configurable in WLLB
3. The priority of the WAN is based on link weight. Spillover algorithm walks through WAN and WAN3G/4G/5G interfaces according to the "Link Weight" of the configured WAN interface. The algorithm starts from high weight priority interface to low link weight interface.
4. One can set Upload and Download bandwidth on spillover configuration separately. If any one of the conditions becomes true, the spillover algorithm triggers.
5. In the UI, one can see a "+" sign next to interface in dashboard / port status to indicate the interface is used as spill-over interface.

Spillover Bandwidth Configuration

To explain the configuration tabs in details – Let us take an example.

1. Location considered for spillover bandwidth has WAN-1 and WAN-2 (2 ISP links).



2. ISP link configured in WAN-2 is considered as primary link which has spillover configuration and has higher link priority compared to WAN-1
3. WLLB is set to Spillover Bandwidth and Bandwidth threshold calculation is set at "1"
4. For this example, the spillover download bandwidth is set at 300Kbps

Configuring WAN Interfaces

1. Login in the NG Series appliance of your choice using default LAN-1 IP and default username and password
2. Click on **Configuration – Network Settings – WAN-1**
3. Based on the ISP-1 link details choose "Static IP" / "DHCP" / "PPPoE" and configure the required parameters provided by the ISP
4. Most of the parameters will be auto set on default configuration
5. On the **Link Properties – Link Priority** set as "5" (this is one of the main configurations to decide which link to use as primary and so on..)
6. In **Spillover Bandwidth** tab set the upload and download bandwidth (In this example since WAN-1 interface is used as spillover interface for both **upload and download bandwidth** settings it needs to be "No Limit"

The screenshot displays the configuration interface for WAN-1. It is divided into two main sections: 'Link Properties' and 'Spillover Bandwidth'. In the 'Link Properties' section, several dropdown menus are visible, with 'Link Priority' set to '5'. In the 'Spillover Bandwidth' section, both 'Maximum Upload Bandwidth' and 'Maximum Download Bandwidth' are set to 'No Limit'.

1. Click on **Configuration – Network Settings – WAN-2**
2. Based on the ISP-1 link details choose "Static IP" / "DHCP" / "PPPoE" and configure the required parameters provided by the ISP
3. Most of the parameters will be auto set on default configuration
4. On the **Link Properties – Link Priority** set as "15" (as this link is decided to be primary link in the example)



5. In **Spillover Bandwidth** tab set the upload and download bandwidth. Being **Upload Bandwidth** is not of concern in this example it was set as **No Limit** and **Download Bandwidth** is set at **300Kbps**. Means when the download bandwidth crosses **300Kbps** the spillover algorithm triggers and the new connections will be moved to WAN-1 interface.

The screenshot shows the 'IPv4 Network Settings: WAN-2' configuration window. It is divided into two sections: 'Link Properties' and 'Spillover Bandwidth'. In the 'Link Properties' section, 'Link Priority' is set to 15. In the 'Spillover Bandwidth' section, 'Maximum Upload Bandwidth' is set to 'No Limit' and 'Maximum Download Bandwidth' is set to 'Enforce Limit' with a value of 300 Kbps.

Configuring “Wan Link Load Balancer (WLLB)”

1. Click on **Configuration – SD-WAN – Wan Link Load Balancer**
2. In **WAN Default Link Balancing Method** choose **Spillover Bandwidth**
3. In **Bandwidth Calculations** set the bandwidth threshold minutes average (support values is between 1-10). In this example it was set at **1**
4. Other parameters can be at default settings or if required can be modified



Open All | Close All

Configuration

- Network Settings
 - WAN-1
 - WAN-2
 - WAN-3
 - WAN-3G/4G/5G
 - LAN-1
 - LAN-2
 - LAN-3
 - VLAN
 - Ethernet LAG
 - Alternate DNS Servers
 - Internal DNS Domains
- Routing
- SD-WAN
 - Routing Policy
 - Balancing Policy
 - Link Management
 - Subnet Load Balancer
 - WAN Link Load Balancer

IPv4 Load Balance Properties

WAN Default Link Balancing Method: **Spillover Bandwidth**

Bandwidth Calculation: **1** minutes average

Scan Interval: **30** seconds

Rescan Delay to Confirm Link Down: **5** seconds

Allowed Packet Loss: **80** %

Allowed Round-trip Latency: **0 - Ignore** milliseconds

Save Reset Restart Service

The above three configuration concludes the Spillover Bandwidth settings and based on the traffic on WAN-2 interface say on reaching "300kbps" of download bandwidth the new TCP/UDP connections will be moved to spillover interface WAN-1. We can able to notice this in Dashboard under Network Interfaces. Whenever you see "+" on WAN-1 means spillover algorithm triggered and working.

System Resources

WAN Bandwidth

CPU Core Usage

Network Interfaces

Status	Interface	IP Address	Rate
UP	WAN-1+	192.168.5.12	2.05 Mbps
UP	WAN-2**	192.168.5.1	2.33 Mbps
UP	LAN-1	192.168.5.1	3.86 Mbps
UP	LAN-2	192.168.6.1	559.72 Kbps
UP	VPN-ipsec7	127.0.1.47	-
UP	VPN-vst1	192.168.40.1	22.67 Kbps
UP	VPN-vst2	10.35.35.1	-
UP	VPN-wss1	192.168.5.241	-

Note- Above pic. shown for ref. purpose Only