

# ARISTA

## Verified Scale Guide

## DANZ Monitoring Fabric (DMF)

Version 8.8



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## DANZ Monitoring Fabric Verified Scale

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This document describes the DANZ Monitoring Fabric (DMF) multi-dimension scale test performed with DMF Controllers.

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## 1.1 Overview

Network visibility is a growing concern in data centers due to increasing virtualization, service-oriented architecture, and cloud-based IT. However, visibility into network traffic with traditional monitoring infrastructure could be improved. Expensive monitoring infrastructure, including application performance monitoring tools, Intrusion Detection Systems (IDS), and forensic tools, could be more efficiently utilized due to a need for more management of monitored traffic.

DANZ Monitoring Fabric (DMF) is an advanced network monitoring solution that alleviates this problem dramatically. DMF leverages high-performance bare metal Ethernet switches to provide the most scalable, flexible, and cost-effective monitoring fabric. Using an SDN-centric architecture, DMF enables tapping traffic everywhere in the network and delivers it to any troubleshooting, network monitoring, application performance monitoring, or security tool.

At its core is the centralized DMF Controller software that converts user-defined policies into highly optimized flows programmed into the forwarding ASICs of bare metal Ethernet switches running the production-grade switch operating system from Arista Networks. DMF delivers unprecedented network visibility with bare-metal economics, getting the right traffic to the right tool at the right time. With its open and published Application Programming Interfaces (APIs), the DMF Controller allows customers to deploy integrated network monitoring solutions along with the DMF.



**Note:** This document's scale and performance numbers came from a DMF hardware Controller.

## 1.2 DMF Verified Scale Values

### 1.2.1 TCAM Rule Limits

The following tables contain the data for the scalability limits tested and verified for the DANZ Monitoring Fabric (DMF).

**Table 1: Verified TCAM Rule Limits**



**Note:** The numbers in the following table are the max TCAM values for Ingress flow2 for the switch series listed. The Ingress flow2 TCAM scale depends on features configured in the Controller, which can be less than the max value.

#### Ingress\_flow2 tcam scale

	Match Mode	7280R3 Series Switches 7289R3 Chassis Switch
IPv4 TCAM rules per switch (Verified Limit/ Max Limit)	Full	8180/8188
	L3-L4	8180/8188
	Offset	8180/8188
IPv6 TCAM rules per switch (Verified Limit/ Max Limit)	Full	8180/8188
	L3-L4	8180/8188
	Offset	8180/8188
Match conditions per policy	Full IPv4/IPv6	8180/8180
	L3-L4 IPv4/IPv6	8180/8180
	L3-L4 Offset IPv4/IPv6	8180/8180



**Important:** Except the 7280R3 switches referenced in Table 3.

	7280R3 Series Switches 7289R3 Chassis Switch
Ingress_flow1 max tcam scale	1024
Egress_flow1 max tcam scale	1024

**Table 2: Verified TCAM Rule Limits**



**Note:** The numbers in the following table are the max TCAM values for Ingress flow2 for the switch series listed. TCAM scale depends on features configured in the Controller, which can be less than the max value.

**Ingress\_flow2 tcam scale**



**Note:** The verified TCAM rule limit applies to the whole chassis, not per line card.

	Match Mode	7800R3 Series Switches
IPv4 TCAM rules per switch (Verified Limit / Max Limit)	Full	8180/8188
	L3-L4	8180/8188
	Offset	8180/8188
IPv6 TCAM rules per switch (Verified Limit / Max Limit)	Full	8180/8188
	L3-L4	8180/8188
	Offset	8180/8188
Match conditions per policy	Full-IPv4/v6	8180/8180
	L3-L4IPv4/v6	8180/8180
	L3-L4	8180/8180
	Offset-IPv4/v6	

	7800R3 Series Switches
Ingress_flow1 max tcam scale	1024 x number of line cards
Egress_flow1 max tcam scale	1024 x number of line cards

**Table 3: Verified TCAM Rule Limits**

**Note:** The numbers in the following table are the max TCAM values for Ingress flow2 for the switch series listed. TCAM scale depends on features configured in the Controller, which can be less than the max value.

**Ingress\_flow2 tcam scale**

	Match Mode	7280SR3E-40YC6 Series Switches, 7280SR3-40YC6 Switch, 7280TR3 Series Switches
IPv4 TCAM Rules per Switch (Verified Limit /Max Limit)	Full	4084/4088
	L3-L4	4084/4088
	Offset	4084/4088
IPv6 TCAM Rules per Switch (Verified Limit /Max Limit)	Full	4084/4088
	L3-L4	4084/4088
	Offset	4084/4088
Match Conditions per Policy	Full IPv4/IPv6	4084/4084
	L3-L4 IPv4/IPv6	4084/4084
	L3-L4 Offset IPv4/IPv6	4084/4084

	7280SR3E-40YC6 Series Switches, 7280SR3-40YC6 Switch, 7280TR3 Series Switches
Ingress_flow1 max tcam scale	512
Egress_flow1 max tcam scale	512

**Table 4: Verified TCAM Rule Limits**

**Ingress\_flow2 tcam scale**

	<b>Match Mode</b>	<b>7050X3 Series Switches</b>
IPv4 TCAM rules per switch (Verified Limit / Max Limit)	Full	3055/3068
	L3-L4	3055/3068
	Offset	3055/3068
IPv6 TCAM rules per switch (Verified Limit / Max Limit)	Full	2300/3068
	L3-L4	2300/3068
	Offset	2300/3068
Match conditions per policy	Full-IPv4/v6	3055/2300
	L3-L4IPv4/v6	3055/2300
	L3-L4 Offset-IPv4/v6	3055/2300

	<b>7050X3 Series Switches</b>
Ingress_flow1 max tcam scale	1024
Egress_flow1 max tcam scale	1024

**Table 5: Verified TCAM Rule Limits****Ingress\_flow2 tcam scale**

	<b>Match Mode</b>	<b>7260X3 Series Switches</b>
IPv4 TCAM rules per switch (Verified Limit / Max Limit)	Full	1015/1020
	L3-L4	1015/1020
	Offset	1015/1020
IPv6 TCAM rules per switch (Verified Limit / Max Limit)	Full	760/1020
	L3-L4	760/1020
	Offset	760/1020
Match conditions per policy	Full-IPv4/v6	1015/760
	L3-L4IPv4/v6	1015/760
	L3-L4 Offset-IPv4/v6	1015/760

	<b>7260X3 Series Switches</b>
Ingress_flow1 max tcam scale	1024
Egress_flow1 max tcam scale	512

**Table 6: Verified TCAM Rule Limits**

**Ingress\_flow2 tcam scale**

	<b>Match Mode</b>	<b>7050DX4 Series Switches, 7050PX4-32S Switch</b>	<b>7050CX4 Series Switches, 7050SDX4 Series Switches, 7050SPX4 Switch</b>
IPv4 TCAM rules per switch (Verified Limit /Max Limit)	Full	4092/4095	6140/6143
	L3-L4	4092/4095	6140/6143
	Offset	2044/2047	3068/3071
IPv6 TCAM rules per switch (Verified Limit /Max Limit)	Full	2044/2047	3068/3071
	L3-L4	2044/2047	3068/3071
	Offset	2044/2047	3068/3071
Match conditions per policy	Full-IPv4/v6	4092/2044	6140/3068
	L3-L4IPv4/v6	4092/2044	6140/3068
	L3-L4 Offset-IPv4/v6	2044/2044	3068/3068

	<b>7050DX4 Series Switches, 7050PX4-32S Switch</b>	<b>7050CX4 Series Switches, 7050SDX4 Series Switches, 7050SPX4 Switch</b>
Ingress_flow1 max tcam scale	N/A	N/A
Egress_flow1 max tcam scale	N/A	N/A

## 1.2.2 Port Channel Interface Limits

**Table 7: Verified Port Channel Interface Limits on Arista 7050X3 and 7260X3 Series Switches**

Arista 7050X3 and 7260X3 Series Switches

	Maximum Hardware/Software	Verified Limits
Number of Port Channel Interfaces Per Switch	64	10
Number of Port Channel Member Interfaces	32	32

**Table 8: Verified Port Channel Interface Limits on Arista 7280R3 Series of Switches**

Arista 7280R3 Series of Switches

	Maximum Hardware/Software	Verified Limits
Number of Port Channel Interfaces Per Switch	1024	16
Number of Port Channel Member Interfaces	32	32

### 1.2.3 Tunnel Interface Limits

Verified VXLAN and L2GRE Tunnel Interface Limits on Arista 7050X3 and 7260X3 Series Switches

#### Arista 7050X3 and 7260X3 Series of Switches

**Table 9: Verified VXLAN Tunnel Interface Limits**

	Maximum Hardware/Software Limit	Verified Limits
VXLAN Rx Tunnels per Switch	2000	2000
VXLAN Bidirectional / Tx Tunnels per Switch	Depends on available ports on switch. <sup>1</sup>	60

<sup>1</sup> Configuration of Bidirectional / Tx Tunnels would require using an additional port. Therefore maximum number of supported Bidirectional / Tx Tunnels would be limited to number of free ports available on the switch.

**Table 10: Verified L2GRE Tunnel Interface Limits**

	Maximum Hardware/Software Limit	Verified Limits
L2GRE Rx Tunnels per Switch	2000	2000
L2GRE Bidirectional / Tx Tunnels per Switch	Depends on available ports on switch.	60

## 1.2.4 Functional Limits

**Table 11: Verified Functional Limits**

<b>Functionality</b>	<b>Verified Limits</b>
Filter Interfaces per switch	<b>128</b>
Delivery interfaces per switch	<b>128</b>
Services Chained in a Policy	<b>4</b>
User created policies per fabric (Disable overlap to create more than 200 user policies)	<b>200</b>
Max number of policies which can overlap	<b>10 (Default is 4)</b>
Max number of policies per fabric (user + dynamic policies)	<b>4000</b>
Switches per Fabric	<b>150</b>
Filter interfaces per Fabric	<b>1500</b>
Delivery interfaces per Fabric	<b>1000</b>
Managed Services Per Fabric	<b>40</b>
Managed Services Per Switch	<b>40</b>
No of Service Nodes Per Fabric	<b>5</b>
Filter interfaces per policy per Fabric	<b>1000</b>
Connected devices per fabric	<b>100</b>
IPv4 address groups	<b>170</b>
IPv4 addresses per group	<b>20000</b>
IPv6 address groups	<b>50</b>
IPv6 addresses per group	<b>100</b>
Maximum RTT between active and standby Controller, between switch and Controllers	<b>300 ms</b>
Maximum Users	<b>500</b>
Maximum Groups	<b>500</b>
Unmanaged Service interfaces per switch	<b>44</b>
Unmanaged Service per switch	<b>22</b>
Unmanaged Service interfaces per Fabric	<b>100</b>
Unmanaged Service per switch	<b>50</b>

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## 1.2.5 Naming Conventions

**Table 12: Naming Conventions**

	Minimum Length	Maximum Length	Allowed Pattern
Username	1	255	[a-zA-Z][-0-9a-zA-Z_]*
Password	1	255	[0-9a-zA-Z./;[]<>?:{} #~!@#\$\$%^&*()_+ -=]
Group Name	1	255	[a-zA-Z][-0-9a-zA-Z_]*
Filter Interface Name	1	255	[a-zA-Z][-.:0-9a-zA-Z_]*
Delivery Interface Name	1	255	[a-zA-Z][-.:0-9a-zA-Z_]*
Service Interface Name	1	255	[a-zA-Z][-.:0-9a-zA-Z_]*
Service Name	1	255	[a-zA-Z][-.:0-9a-zA-Z_]*

## 1.3 DMF Service Node Verified Scale Values

### 1.3.1 NetFlow Scale Values

**Table 13: Verified NetFlow Scale Values**

DMF Service Node: Netflow	Verified Limits
Service Node Throughput per port <sup>1</sup>	(DCA-DM-SC, DCA-DM-SDL) <ul style="list-style-type: none"> <li>10 Gbps for IMIX traffic.</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>20 Gbps for IMIX traffic.</li> </ul>
Max Packets processed per port	(DCA-DM-SC <sup>2</sup> ) <ul style="list-style-type: none"> <li>6.0 million pps per port when 1 port is used.</li> </ul> (DCA-DM-SDL <sup>3</sup> ) <ul style="list-style-type: none"> <li>5.5 million pps per port when 1 port is used.</li> </ul> (DCA-DM-SEL <sup>4</sup> ) <ul style="list-style-type: none"> <li>7.5 million pps per port when 1 port is used.</li> </ul> (DCA-DM-SC <sup>2</sup> ) <ul style="list-style-type: none"> <li>5.5 million pps per port when 2 ports on the same NIC are used.</li> </ul> (DCA-DM-SDL <sup>3</sup> ) <ul style="list-style-type: none"> <li>5.0 million pps per port when 4 ports on the same NIC are used.</li> </ul> (DCA-DM-SEL <sup>4</sup> ) <ul style="list-style-type: none"> <li>7.0 million pps per port when 2 ports on the same NIC are used.</li> </ul> (DCA-DM-SDL <sup>3</sup> ) <ul style="list-style-type: none"> <li>4.0 million pps per port when 16 port are used.</li> </ul> (DCA-DM-SEL <sup>4</sup> ) <ul style="list-style-type: none"> <li>6.0 million pps per port when 16 ports are used.</li> </ul>
Expected Netflow Traffic out of per service node port	300Mbps <sup>5</sup>
Max Number of Flows supported	1 million per port of supported managed-appliances. 16 million per 16 ports of supported managed-appliances.

<sup>1</sup> In push-per-policy mode, a 4-byte internal VLAN tag is added to the traffic and this reduces the maximum bandwidth supported.

<sup>2</sup> DCA-DM-SC Service Node (4x10G) handles 10 Gbps per port with average packet size >= 210 bytes.

<sup>3</sup> DCA-DM-SDL Service Node (16x10G) handles 10 Gbps traffic per port with average packet size >= 285 bytes.

<sup>4</sup> DCA-DM-SEL Service Node (16x25G) handles 20 Gbps traffic per port with average packet size >= 68 bytes.

<sup>5</sup> Measured when each service node port sent 1 million flow records at the same time.



**Note:** All executed test cases send 10Gbps traffic to supported 10G service node ports with 1 million flows.



**Note:** All executed test cases send 20Gbps traffic to the DCA-DM-SEL.

## 1.3.2 IPFIX Scale Values

**Table 14: IPFIX Template Used**

IPv4 Template	IPv6 Template
<ul style="list-style-type: none"> <li>key destination-ipv4-address</li> </ul>	<ul style="list-style-type: none"> <li>key destination-ipv6-address</li> </ul>
<ul style="list-style-type: none"> <li>key destination-transport-port</li> </ul>	<ul style="list-style-type: none"> <li>key destination-transport-port</li> </ul>
<ul style="list-style-type: none"> <li>key dot1q-vlan-id</li> </ul>	<ul style="list-style-type: none"> <li>key dot1q-vlan-id</li> </ul>
<ul style="list-style-type: none"> <li>key source-ipv4-address</li> </ul>	<ul style="list-style-type: none"> <li>key source-ipv6-address</li> </ul>
<ul style="list-style-type: none"> <li>key source-transport-port</li> </ul>	<ul style="list-style-type: none"> <li>key source-transport-port</li> </ul>
<ul style="list-style-type: none"> <li>field flow-end-milliseconds</li> </ul>	<ul style="list-style-type: none"> <li>field flow-end-milliseconds</li> </ul>
<ul style="list-style-type: none"> <li>field flow-end-reason</li> </ul>	<ul style="list-style-type: none"> <li>field flow-end-reason</li> </ul>
<ul style="list-style-type: none"> <li>field flow-start-milliseconds</li> </ul>	<ul style="list-style-type: none"> <li>field flow-start-milliseconds</li> </ul>
<ul style="list-style-type: none"> <li>field maximum-ttl</li> </ul>	<ul style="list-style-type: none"> <li>field maximum-ttl</li> </ul>
<ul style="list-style-type: none"> <li>field minimum-ttl</li> </ul>	<ul style="list-style-type: none"> <li>field minimum-ttl</li> </ul>
<ul style="list-style-type: none"> <li>field packet-delta-count</li> </ul>	<ul style="list-style-type: none"> <li>field packet-delta-count</li> </ul>



**Note:** All executed test cases send 10Gbps traffic to all supported 10G service node ports with 1 million flows.

**Table 15: Verified IPFIX Scale Values**

DMF Service Node: IPFIX	IPv4 Verified Limits	IPv6 Verified Limits
Service Node Throughput per port. <sup>1</sup>	(DCA-DM-SC) <ul style="list-style-type: none"> <li>• 10 Gbps for IMIX traffic.</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>• 20 Gbps for IMIX traffic.</li> </ul>	(DCA-DM-SC) <ul style="list-style-type: none"> <li>• 10 Gbps for IMIX traffic.</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>• 11 Gbps for IMIX traffic.</li> </ul>
Max Packets processed per port.	(DCA-DM-SC <sup>2</sup> ) <ul style="list-style-type: none"> <li>• 7.5 million pps per port when 1 port is used.</li> <li>• 7.0 million pps per port when 2 ports on the same NIC are used.</li> </ul> (DCA-DM-SEL <sup>3</sup> ) <ul style="list-style-type: none"> <li>• 9.5 million pps per port when 1 port is used.</li> <li>• 8.5 million pps per port when 2 ports on the same NIC are used.</li> <li>• 7.0 million pps per port when 16 ports are used.</li> </ul>	(DCA-DM-SC <sup>2</sup> ) <ul style="list-style-type: none"> <li>• 6.4 million pps per port when 1 port is used.</li> <li>• 6.0 million pps per port when 2 ports on the same NIC are used.</li> </ul> (DC-DM-SEL <sup>3</sup> ) <ul style="list-style-type: none"> <li>• 7.5 million pps per port when 1 port is used.</li> <li>• 7.5 million pps per port when 2 ports on the same NIC are used.</li> <li>• 6.5 million pps per port when 16 ports are used.</li> </ul>
Expected IPFIX Traffic out of per service node port.	300 Mbps <sup>4</sup> .	500 Mbps <sup>4</sup> .
Max Number of Flows tested per port.	(DCA-DM-SC) <ul style="list-style-type: none"> <li>• 1 million per port.</li> <li>• 4 million when 4 ports are used.</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>• 16 million when 16 ports are used.</li> </ul>	(DCA-DM-SC) <ul style="list-style-type: none"> <li>• 1 million per port.</li> <li>• 4 million when 4 ports are used.</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>• 16 million when 16 ports are used.</li> </ul>

<sup>1</sup> In push-per-policy mode, a 4-byte internal VLAN tag is added to the traffic and this reduces the maximum bandwidth supported and recommended.

<sup>2</sup> DCA-DM-SC (4x10G) handles 10Gbps traffic per port with average packet size IPv4 >= 160 byte for IPv6 >=190 byte.

<sup>3</sup> DCA-DM-SEL (16x25G) handles 20Gbps traffic per port with average packet size IPv4 >= 68 byte and 10Gbps traffic per port with average packet size IPV6 >= 218 bytes.

<sup>4</sup> Measured when service node exports ipfix data packets representing 1 million unique flows information with default eviction timers.


### 1.3.3 Deduplication Verified Scale Values

**Table 16: Verified Scale for Deduplication Managed Services**

Managed Service	One Service Node Port	4 Service Node Ports	16 Service Node Ports
Deduplication Maximum Packet Rate Processed	<p>(DCA-DM-SC)</p> <ul style="list-style-type: none"> <li>2 ms window: 14 million pps.</li> <li>4, 6 ms window: 13 million pps.</li> <li>8 ms window: 11 million pps.</li> </ul> <p>(DCA-DM-SDL)</p> <ul style="list-style-type: none"> <li>2 ms window: 14 million pps.</li> <li>4, 6 ms window: 13 million pps.</li> <li>8 ms window: 11 million pps.</li> </ul> <p>(DCA-DM-SEL)</p> <ul style="list-style-type: none"> <li>2 ms window: 19 million pps.</li> <li>4, 6 ms window: 18 million pps.</li> <li>8 ms window: 16 million pps.</li> </ul>	<p>(DCA-DM-SC)</p> <ul style="list-style-type: none"> <li>2 ms window: 13 million pps per port when 4 ports are used.</li> <li>4, 6 ms window: 13 million pps per port when 4 ports are used.</li> <li>8 ms window: 11 million pps per port when 4 ports are used.</li> </ul> <p>(DCA-DM-SDL)</p> <ul style="list-style-type: none"> <li>2, 4, 6, 8 ms window: 8 million pps.</li> </ul> <p>(DCA-DM-SEL)<sup>1</sup></p> <ul style="list-style-type: none"> <li>2 ms window: 17.5 million pps per port when 2 ports on the same NIC are used.</li> <li>4, 6 ms window: 16.5 million pps per port when 2 ports on the same NIC are used.</li> <li>8 ms window: 15.5 million pps per port when 2 ports on the same NIC are used.</li> </ul>	<p>(DCA-DM-SDL)</p> <ul style="list-style-type: none"> <li>2, 4, 6, 8 ms window: 8 million pps.</li> </ul> <p>(DCA-DM-SEL)</p> <ul style="list-style-type: none"> <li>2, 4, 6, 8 ms window: 15.5 million unique pps.</li> </ul>

Managed Service	One Service Node Port	4 Service Node Ports	16 Service Node Ports
Deduplication Maximum Bandwidth by Service Node Port <sup>2</sup>	(DCA-DM-SC, DCA-DM-SDL)  10 Gbps for IMIX traffic. <ul style="list-style-type: none"> <li>2 ms window: It handles 10 Gbps traffic per port with average packet size &gt; 70 bytes.</li> <li>4, 6 ms window: It handles 10 Gbps traffic per port with average packet size &gt; 76 bytes.</li> <li>8 ms window: It handles 10 Gbps traffic per port with average packet size &gt; 94 bytes.</li> </ul> (DCA-DM-SEL)  20 Gbps for IMIX traffic. <ul style="list-style-type: none"> <li>2 ms window: It handles 20 Gbps traffic per port with average packet size &gt; 110 bytes.</li> <li>4, 6 ms window: It handles 20 Gbps traffic per port with average packet size &gt; 120 bytes.</li> <li>8 ms window: It handles 20 Gbps traffic per port with average packet size &gt; 140 bytes.</li> </ul>	(DCA-DM-SC)  40 Gbps for IMIX traffic. <ul style="list-style-type: none"> <li>2 ms window: It handles 10 Gbps traffic per port with average packet size &gt; 76 bytes.</li> <li>4, 6 ms window: It handles 10 Gbps traffic per port with average packet size &gt; 76 bytes.</li> <li>8 ms window: It handles 10 Gbps traffic per port with average packet size &gt; 94 bytes.</li> </ul> (DCA-DM-SDL)  40 Gbps. Handles line-rate IMIX traffic. Service node ports handles 10G line-rate traffic per port with average packet size > 140 bytes.           (DCA-DM-SEL) <sup>3</sup>  80 Gbps for IMIX traffic. <ul style="list-style-type: none"> <li>2 ms window: It handles 20 Gbps traffic per port with average packet size &gt; 120 bytes.</li> <li>4, 6 ms window: It handles 20 Gbps traffic per port with average packet size &gt; 130 bytes.</li> <li>8 ms window: It handles 20 Gbps traffic per port with average packet size &gt; 140 bytes.</li> </ul>	(DCA-DM-SDL)  160 Gbps for IMIX traffic. <ul style="list-style-type: none"> <li>Handles line-rate IMIX traffic. Service node ports handles 10G line-rate traffic per port with average packet size &gt; 140 bytes.</li> </ul> (DCA-DM-SEL) <sup>3</sup>  320 Gbps for IMIX traffic. <ul style="list-style-type: none"> <li>Service node ports handles 20 Gbps traffic per port with average packet size &gt; 140 bytes.</li> </ul>

- 1 DCA-DM-SEL NIC Hardware configuration is 2 Port, Published numbers represent NIC card Performance.
- 2 In push-per-policy mode, 4-byte internal VLAN tags are added to the traffic, which reduces the maximum bandwidth supported to 9.7 Gbps.
- 3 DCA-DM-SEL maximum supported bandwidth per port is 20 Gig.

 **Note:** Tested for 100%, 50%, 20%, and 0% deduplication by sending 10Gbps traffic with different packet sizes.

### 1.3.4 Header Stripping Verified Scale Values

**Table 17: Header Stripping Verified Scale Values**

Managed Service	One Service Node Port	4 Service Node Port	16 Service Node Port
Header Stripping Maximum Packet Rate Processed	(DCA-DM-SC) <ul style="list-style-type: none"> <li>14 million pps per port.</li> </ul> (DCA-DM-SDL) <ul style="list-style-type: none"> <li>12 million pps per port.</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>29 million pps per port.</li> </ul>	(DCA-DM-SC) <ul style="list-style-type: none"> <li>14 million pps per port.</li> </ul> (DCA-DM-SDL) <ul style="list-style-type: none"> <li>8 million pps per port.</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>29 million pps per port.</li> </ul>	(DCA-DM-SDL) <ul style="list-style-type: none"> <li>7.5 million pps per port.</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>14.5 million pps per port.</li> </ul>
Header Stripping Maximum Bandwidth by Service Node Port <sup>1</sup>	(DCA-DM-SC) <ul style="list-style-type: none"> <li>10 Gbps for IMIX traffic. It handles 10 Gbps traffic per port with average packet size &gt; 70 bytes.</li> </ul> (DCA-DM-SDL) <ul style="list-style-type: none"> <li>10 Gbps for IMIX traffic. It handles 10 Gbps traffic per port with average packet size &gt; 85 bytes.</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>20 Gbps for IMIX traffic. It handles 20 Gbps traffic per port with average packet size &gt; 90 bytes.</li> </ul>	(DCA-DM-SC) <ul style="list-style-type: none"> <li>40 Gbps for IMIX traffic. It handles 10 Gbps traffic per port with average packet size &gt; 70 bytes.</li> </ul> (DCA-DM-SDL) <ul style="list-style-type: none"> <li>40 Gbps for IMIX traffic. It handles 10 Gbps traffic per port with average packet size &gt; 140 bytes.</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>80 Gbps for IMIX traffic. It handles 20 Gbps traffic per port with average packet size &gt; 90 bytes.</li> </ul>	(DCA-DM-SDL) <ul style="list-style-type: none"> <li>160 Gbps for IMIX traffic. It handles 10 Gbps traffic per port with average packet size &gt; 145 bytes.</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>320 Gbps for IMIX traffic. It handles 20 Gbps traffic per port with average packet size &gt; 190 bytes.</li> </ul>

<sup>1</sup> In push-per-policy mode, 4-byte internal VLAN tags are added to the traffic, which reduces the maximum bandwidth supported to 9.7 Gbps.



**Note:** Tested VXLAN, MPLS, ERSPAN<sup>1</sup> and LISP encapsulated packets of different sizes at line rate.

<sup>1</sup> DCA-DM-SEL support of ERSPAN managed-service has limitations.

### 1.3.5 Slicing, Masking and Pattern Matching Verified Scale Values


This section summarizes the verified scale values for DMF Service Node managed services.

- Slicing
- Masking
- Pattern Matching

**Table 18: Verified Scale for Packet Slicing as a Managed Service**

Processing rate and supported bandwidth <sup>1</sup>	One Service Node Port	4 Service Node Ports	16 Service Node Ports
Maximum Packet Rate Processed	(DCA-DM-SC) <ul style="list-style-type: none"> <li>• 14 million pps per port</li> </ul> (DCA-DM-SDL) <ul style="list-style-type: none"> <li>• 14 million pps per port</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>• 29.5 million pps per port</li> </ul>	(DCA-DM-SC) <ul style="list-style-type: none"> <li>• 13 million pps per port</li> </ul> (DCA-DM-SDL) <ul style="list-style-type: none"> <li>• 8 million pps per port</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>• 17.5 million pps per port</li> </ul>	(DCA-DM-SDL) <ul style="list-style-type: none"> <li>• 8 million pps per port.</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>• 17.5 million pps per port.</li> </ul>
Maximum Bandwidth by Service Node	(DCA-DM-SC, DCA-DM-SDL) <ul style="list-style-type: none"> <li>• 10 Gbps for IMIX traffic. It handles 10 Gbps traffic per port with average packet size &gt; 70 bytes.</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>• 20 Gbps for IMIX traffic. It handles 20 Gbps traffic per port with average packet size &gt; 85 bytes.</li> </ul>	(DCA-DM-SC) <ul style="list-style-type: none"> <li>• 40 Gbps for IMIX traffic. It handles 10 Gbps traffic per port with average packet size &gt; 70 bytes.</li> </ul> (DCA-DM-SDL) <ul style="list-style-type: none"> <li>• 40 Gbps for IMIX traffic. It handles 10 Gbps traffic per port with average packet size &gt; 140 bytes.</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>• 80 Gbps for IMIX traffic. It handles 20 Gbps traffic per port with average packet size &gt; 160 bytes.</li> </ul>	(DCA-DM-SDL) <ul style="list-style-type: none"> <li>• 160 Gbps for IMIX traffic. It handles 10 Gbps traffic per port with average packet size &gt; 140 bytes.</li> </ul> (DCA-DM-SEL) <ul style="list-style-type: none"> <li>• 320 Gbps for IMIX traffic. It handles 20 Gbps traffic per port with average packet size &gt; 160 bytes.</li> </ul>

<sup>1</sup> In push-per-policy mode, 4-byte internal VLAN tags are added to the traffic, which reduces the maximum bandwidth supported to 9.7 Gbps.

 **Note:** Tested different packet sizes with line rate traffic.

**Table 19: Verified Scale for Packet Masking as a Managed Service**

Processing rate/bandwidth supported <sup>1</sup>	One Service Node Port	4 Service Node Ports	16 Service Node Ports
Maximum Packet Rate Processed	Depending on regex pattern DCA-DM-SC supports 40% of 10 Gbps traffic or more per port.  DCA-DM-SEL supports 31% <sup>2</sup> of 20 Gbps <sup>3</sup> traffic or more per port.		
Maximum Bandwidth by Service Node Port	Depending on regex pattern One Service Node port handles about 40% of 10 Gbps traffic or more.  To get 10 Gbps performance, use LAG with 2 or more Service Node ports.		

1 In push-per-policy mode, 4-byte internal VLAN tags are added to the traffic, which reduces the maximum bandwidth supported to 9.7 Gbps.

2 With regex `\d{3}-\d{2}-\d{4}` to match/mask/drop packets with Social Security numbers in a 64 byte packet, DCA-DM-SEL can handle 11 million pps. With regex `\d{4}[\s-]*\d{4}[\s-]*\d{4}` to match/mask/drop packets with credit card numbers in a 68 byte packet, DCA-DM-SEL supports masking service 11 million pps. Higher the packet size and position of match string in the packet will influence performance. Performance can be optimized by setting appropriate l4-payload off-set value.

3 Two ports belongs to single NIC card.

**Table 20: Verified Scale for Pattern Matching as a Managed Service**

Processing rate/bandwidth supported <sup>1</sup>	One Service Node Port	4 Service Node Ports	16 Service Node Ports
Maximum Packet Rate Processed	Depending on regex pattern One Service Node port handles about 50% of 10 Gbps traffic or more.  DCA-DM-SEL supports 36% of 20 Gbps traffic or more per port.		
Maximum Bandwidth by Service Node Port	Depending on regex pattern One Service Node port handles about 50% of 10 Gbps traffic or more.  To get 10 Gbps performance, use LAG with 2 or more Service Node ports.		

1 In push-per-policy mode, 4-byte internal VLAN tags are added to the traffic, which reduces the maximum bandwidth supported to 9.7 Gbps.



**Note:** The performance of packet masking or packet matching depends on the packet length and the complexity of the regular expression.

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### 1.3.6 Session Slice Scale Values

This section summarizes the verified scale values for TCP and UDP session-slicing configured as a managed service action.

#### Session-Slice Scale Values for UDP

Service Node Port	IPv4 UDP Session	IPv6 UDP Session	IPv4/6 UDP Session
One	524000 Max sessions	524000 Max sessions	1 Million Max sessions
4 Port	2 Million Max sessions	2 Million Max sessions	4 Million Max sessions

#### Session-Slice Scale Values for TCP

Service Node Port	IPv4 TCP Session	IPv6 TCP Session	IPv4/6 TCP Session
One	524000 Max sessions	524000 Max sessions	1 Million Max sessions
4 Port	2 Million Max sessions	2 Million Max sessions	4 Million Max sessions

Each service node port supports 524000 maximum sessions for each traffic type - TCP/UDP/TCP6/UDP6. With mixed traffic (TCP,TCP6,UDP,UDP6), each service node port supports a maximum of 2 million sessions.

## 1.4 Analytics Node Verified Scale Values

This section displays the tested scalability values for the Analytics Node.

**Table 21: Analytics Node Scale Performance Results**

	Single Node Cluster	Three Node Cluster	Five Node Cluster
ARP	20,000 pkts/sec	60,000 pkts/sec	100,000 pkts/sec
DHCP	15,000 pkts/sec	30,000 pkts/sec	60,000 pkts/sec
ICMP	15,000 pkts/sec	40,000 pkts/sec	80,000 pkts/sec
DNS	8,000 pkts/sec	20,000 pkts/sec	32,000 pkts/sec
TCPFlow	6,000 flows/	18,000 flows/sec	30,000 flows/sec
sFLOW <sup>®1</sup>	12,000 flows/sec	30,000 flows/sec	70,000 flows/sec
NetFlow v5 without Optimization <sup>2</sup>	12,000 flows/sec	32,000 flows/sec	60,000 flows/sec
IPFIX without Optimization <sup>2</sup>	9,000 flows/sec	27,000 flows/sec	45,000 flows/sec
NetFlow v9 without Optimization <sup>2</sup>	9,000 flows/sec	27,000 flows/sec	45,000 flows/sec
All the Above Cases Combined: <sup>3</sup>	ARP: 800 pkts/sec DHCP: 500 pkts/sec ICMP: 300 pkts/sec DNS: 3,000 pkts/sec TCPFlow: 300 flows/sec sFLOW: 3,000 flows/sec Netflow version 5: 5,000 flows/ sec	ARP: 1,800 pkts/sec DHCP: 900 pkts/sec ICMP: 1,200 pkts/sec DNS: 6,000 pkts/sec TCPFlow: 400 flows/sec sFLOW: 6,000 flows/sec Netflow version 5: 10,000 flows/ sec	ARP: 2,000 pkts/sec DHCP: 1,200 pkts/sec ICMP: 2,000 pkts/sec DNS: 8,000 pkts/sec TCPFlow: 500 flows/sec sFLOW: 8,000 flows/sec Netflow version 5: 13,000 flows/ sec

<sup>1</sup> sFlow<sup>®</sup> is a registered trademark of Inmon Corp.

<sup>2</sup> The Netflow with optimization test cases yield a result of 100,000 flows/sec for a single analytics node cluster. For more details about Netflow optimization, please refer to the Arista Analytics User Guide.

<sup>3</sup> The rate of traffic chosen is for testing purposes only. In production network the rate of traffic for each protocol may vary.



**Note:** The above test measurements were performed with 60% average CPU Utilization.

## 1.5 Recorder Node Verified Scale Values

This section displays the tested performance numbers for the Recorder Node with no-drop packet capture characteristics.

**Table 22: Maximum packets recorded on a DCA-DM-RA3 Recorder Node**

Packet Size (Bytes)	Packets per second	Maximum Bandwidth (Gbps)
1500 Bytes or greater	~1.98 million	24 Gbps
512 Bytes or greater	~4.7 million	20 Gbps
IMIX	~6.3 million	19 Gbps
256 Bytes or greater	~8.6 million	19 Gbps

**Table 23: Maximum packets recorded on a DCA-DM-RN760 Recorder Node**

Packet Size (Bytes)	Packets per second	Maximum Bandwidth (Gbps)
1500 Bytes or greater	~1.52 million	20 Gbps
512 Bytes or greater	~4.01 million	18 Gbps
IMIX	~5.40 million	17 Gbps
256 Bytes or greater	~6.24 million	14 Gbps

**Table 24: Maximum packets recorded on a DCA-DM-RN760L Recorder Node**

Packet Size (Bytes)	Packets per second	Maximum Bandwidth (Gbps)
1500 Bytes or greater	~1.60 million	22 Gbps
512 Bytes or greater	~4.34 million	20 Gbps
IMIX	~5.72 million	18 Gbps
256 Bytes or greater	~7.58 million	19 Gbps



**Note:** IMIX is a 7:4:1 distribution of 64, 570, and 1518-byte Ethernet-encapsulated packets, leading to a 353-byte packet size average.

## References

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### A.1 Related Documents

The following documentation is available for **DANZ Monitoring Fabric**:

- *DANZ Monitoring Fabric Release Notes*
- *DANZ Monitoring Fabric User Guide*
- *DANZ Monitoring Fabric Deployment Guide*
- *DANZ Monitoring Fabric Hardware Compatibility List*
- *DANZ Monitoring Fabric Hardware Guide*
- *DANZ Monitoring Fabric Verified Scale Guide*
- *DANZ Monitoring Fabric SNMP MIB Reference Guide*
- *DANZ Monitoring Fabric REST API Guide*
- *DANZ Monitoring Fabric Log Message Guide*