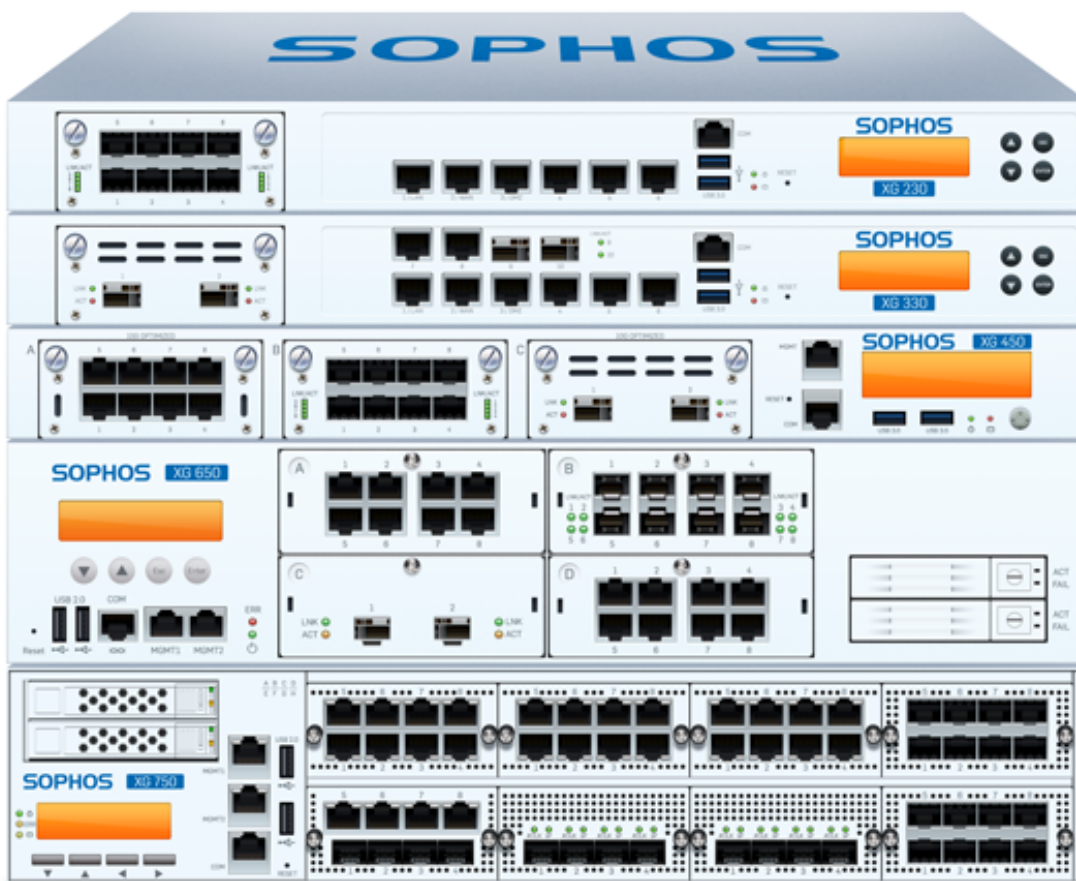




Sizing Guidelines

Sophos XG Firewall - XG Series Appliances



Three steps to specifying the right appliance model

This document provides a guideline for choosing the right Sophos XG Series appliance for your customer. Specifying the right appliance is dependent on a number of factors and involves developing a usage profile for the users and the network environment.

For best results we recommend using the following step-by-step procedure:

1. Identify the “Total weighted User” Number

Understand the customer’s environment like browsing behavior, application usage, network and server infrastructure to get an accurate understanding of the actual usage an XG Series appliance will see at peak times.

2. Make a first estimate

Based on the Total weighted User number.

3. Check specific throughput requirements

Understand if any local factors like the maximum available internet uplink capacity will impact performance – check this against Sophos XG Firewall throughput numbers and adjust the recommendation accordingly.

Of course, the best way to understand if an appliance will meet a customer's needs is to test it in the customer environment and with Sophos XG Firewall you can offer a free on-site evaluation of the selected unit.

1. Identify the “Total Weighted User” number

Use the following table to first calculate the Total weighted User number that the appliance will need to handle.

- a. Calculate the Weighted User Count number. Identify the user category (Average/Advanced/Power) that best fits the average user behavior of the users, or estimate how many users fit each category. Use the criteria in table 1.2 to classify the type of users.
 - Enter the User Counts in table 1.1, multiply them with the indicated factor, enter the results into the "Weighted User Count" boxes and sum it into the "Total Weighted User Count" box.
- b. Identify the System Load Number. Use the criteria using table 1.3 to classify the load.
 - Enter the System Load Number in the box "multiplied by System Load" in table 1.1, multiply it with the "Total Weighted User Count" and enter the result into the "Total weighted Users" box.

Table 1.1

	User Count	Multiplied by	Weighted User Count
Standard user		1	
Advanced Users		1.2	
Power Users		1.5	
Total User Count		Total Weighted User Count	
		multiplied by System Load	
		Total weighted Users	

1.2 User Category Criteria

Use the criteria described below to classify the type of users.

	Average user	Advanced user (*1.2)	Power user (*1.5)
Email usage (per 10h working day)			
Number of received emails in inbox	< 50	50 to 100	>100
Data volume	Few MBytes	Multiple MBytes	Numerous MBytes
Web usage (per 10h working day)			
Data volume	Few MBytes	Multiple MBytes	Numerous MBytes
Usage pattern	Equally spread throughout the day	Various peaks	Many peaks
Web applications used	Mostly webmail / Google / news	Heavy surfing, moderate media transfer, business applications	Intensive surfing and media transfers (schools, universities)
VPN usage			
VPN remote access usage	Rarely – sporadically connected	Several times per week – connected at regular times	Every day – connected most of the time

1.3 System Load Criteria

Identify any specific requirements that might increase the overall system load and hence the performance requirements for the system.

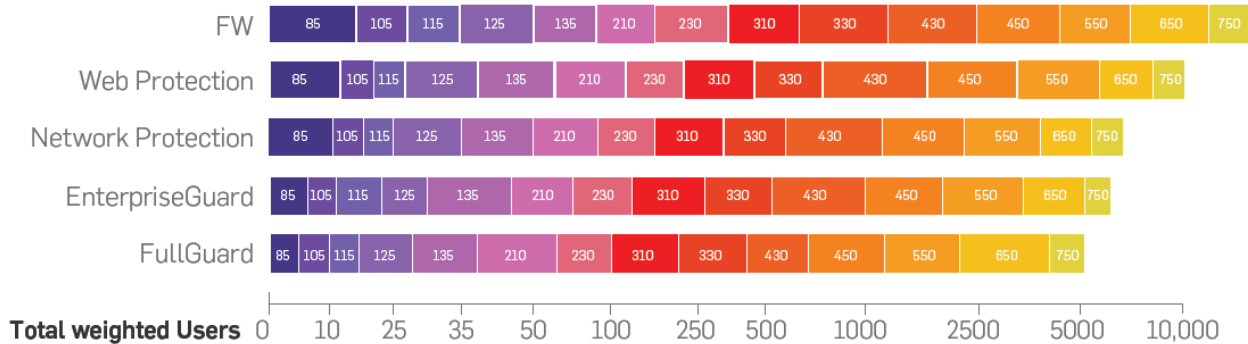
	Average system usage	Advanced system usage (*1.2)	High system usage (*1.5)
Authentication			
Active Directory in use	No	Yes	Yes
FW/IPS/VPN usage			
Variety of systems to be protected by IPS	No IPS protection required	Mostly Windows PCs, 1-2 servers	Various Client Operating systems, browsers and multimedia apps, >2 servers
Email			
Percentage of Spam	<50%	50-90%	>90%
Reporting			
Report storage time and granularity requirement	Up to 1 month web report only (per Domain)	Up to 3 months Up to 5 reports (per Domain)	>3 months (per URL)
Accounting storage time on appliance	No	Up to 1 month	>1 month

2. Make a first estimate — using the calculated “Total weighted User” number

Take the “Total weighted User” and make a first estimate for the required XG Series hardware appliance within the following diagram:

- Each line shows the range of users recommended when only using this single subscription.
- Please ensure all numbers include users connected via VPN, RED and wireless APs.

Subscription Profile



Rule of thumb:

- Estimate that using Wireless Protection or Webserver Protection with any of the profiles mentioned above will decrease range by 5-10% each.

3. Check for specific throughput requirements

Depending on the customer’s environment there might be specific throughput requirements driving an adjustment of your first estimate to a higher (or even lower) unit.

These requirements are typically based on the following two factors:

The maximum available internet uplink capacity

The capacity of the customer’s internet connection (up- and downlink) should match the average throughput rate that the selected unit is able to forward (depending on the subscriptions in use).

For instance if the download or upload limit is only 20 Mbps then there is no great benefit in using an XG 230 instead of an XG 210, even though the calculated total number of users is around 100. In that case even an XG 210 might be sufficient because it can perfectly fill the complete internet link even with all UTM features enabled.

However, data might not only be filtered on its way to the internet but also between internal network segments. Hence consider internal traffic that traverses the firewall as well in this assessment.

Specific performance requirements based on customer experience or knowledge

If the customer knows their overall throughput requirements among all connected internal and external interfaces (e.g. based on their past experience) then check whether the selected unit is able to meet these numbers.

For instance the customer might have several servers located within a DMZ and want to get all traffic to those servers from all segments to be inspected by the IPS. Or the customer may have many different network segments that should be protected against each other (by using the FW packet filter and/or the Application Control feature). In this case consider that the unit must scan the complete internal traffic between all segments.

Further questions to ask in order to find out if there are any other performance requirements:

- How many site-to-site VPN tunnels are required?
- How many emails are being transferred per hour - on average/at peak times?
- How much web traffic (Mbps and requests/s) is being generated - on average/at peak times?
- How many web servers should be protected and how much traffic is expected - on average/at peak times?

The following section provides detailed performance numbers to help determine whether the selected appliance meets all individual requirements.

Sophos XG Series Hardware performance numbers

The following table provides performance numbers by traffic type measured within Sophos testing labs. "Realworld" numbers represent throughput values achievable with a typical/real life traffic and protocol mix as defined by NSS Labs. All "Realworld" numbers have been measured under a **50% CPU load** only in order to leave enough resources available for the system to process other tasks like GUI rendering, report generation and viewing, pattern updates, etc.

These numbers might be more conservative than numbers measured for other systems or by other testing labs & methods. Allocating 100% CPU resources to network traffic processing would typically double the numbers provided – this is how NSS Labs performs testing and this is also how SG Series we're tested under UTM 9 for comparison.

Maximum numbers represent best throughput achievable under perfect conditions, e.g. using large packet sizes with UDP traffic only at full CPU load.

Please note that none of these numbers are guaranteed as performance may vary in a real life customer scenario based on user characteristics, application usage, security configurations and other factors. Hence these numbers should only be used as a rough sizing guideline.

Small - Desktop

Model	XG 85/w rev.1	XG 105/w rev.2	XG 115/w rev.2	XG 125/w rev.2	XG 135/w rev.2
Performance Numbers					
Firewall max. ¹ (Mbps)	2,000	3,000	3,500	5,000	7,000
IPS max. ¹ (Mbps)	510	700	900	1,040	1,750
IPS Realworld ² (Mbps)	75	86	103	180	232
Web Proxy – AV (Mbps)	330	430	520	590	1,400
Web Proxy – AV Realworld ² (Mbps)	75	187	234	307	427
IPS + Web Proxy – AV Realworld ² (Mbps)	31	36	42	58	95
IPS + App Ctrl + WebFilter Realworld ² (Mbps)	25	27	30	75	133
VPN AES max. ³ (Mbps)	200	300	350	410	950
VPN AES Realworld ² (Mbps)	50	75	90	105	240
Maximum recommended connections					
New TCP connections/sec	12,000	27,500	27,500	35,000	82,000
Concurrent TCP connections	2,000,000	3,200,000	6,000,000	6,200,000	8,200,000
Concurrent IPsec VPN tunnels	200	300	500	750	1000
Concurrent Access Points	5	10	20	30	40
Concurrent REDs (UTM/FW) ³	5/10	10/30	15/60	20/80	25/100

1. 1518 byte packet size (UDP), default rule set

2. Avg. of Data Center, Enterprise Perimeter, Higher Education, European Mobile, Financial Network protocol mixes at 50% CPU Usage

3. HTTP traffic

4. UTM=Full content scanning of RED traffic on XG appliance, FW=packet filtering only

Medium - 1U

Model	XG 210 rev.2	XG 230 rev.1	XG 310 rev.1	XG 330 rev.1	XG 430 rev.1	XG 450 rev.1
Performance Numbers						
Firewall max. ¹ (Mbps)	14,000	18,000	25,000	30,000	37,000	45,000
IPS max. ¹ (Mbps)	2,700	4,200	5,500	8,500	9,000	10,000
IPS Realworld ² (Mbps)	309	361	539	733	893	1159
Web Proxy – AV (Mbps)	2,300	2,800	3,260	6,000	6,500	7,000
Web Proxy – AV Realworld ² (Mbps)	538	670	1140	1220	1440	1690
IPS + Web Proxy – AV Realworld ²	102	107	207	242	372	463
IPS + App Ctrl + WebFilter Realworld	176	226	340	425	538	693
VPN AES max. ³ (Mbps)	1,350	1,500	2,500	3,200	4,800	5,500
VPN AES Realworld ² (Mbps)	340	375	625	800	1200	1375
Maximum recommended connections						
New TCP connections/sec	135,000	140,000	200,000	200,000	200,000	200,000
Concurrent TCP connections	8,200,000	8,200,000	17,500,000	17,500,000	20,000,000	20,000,000
Concurrent IPsec VPN tunnels	1300	1420	2488	3200	4800	5200
Concurrent Access Points	75	100	125	150	230	250
Concurrent REDs (UTM/FW) ⁴	30/125	40/150	50/200	60/230	70/250	80/300

Large - 2U

Model	XG 550 rev.1	XG 650 rev.1	XG 750 rev.1
Performance Numbers			
Firewall max. ¹ (Mbps)	60,000	80,000	140,000
IPS max. ¹ (Mbps)	17,000	20,000	22,000
IPS Realworld ² (Mbps)	2160	3310	3970
Web Proxy – AV (Mbps)	10,000	13,000	17,000
Web Proxy – AV Realworld ² (Mbps)	2480	3220	3870
IPS + Web Proxy – AV Realworld ²	808	1109	1330
IPS + App Ctrl + WebFilter Realworld	1190	1730	2070
VPN AES max. ³ (Mbps)	8,400	9,000	11,250
VPN AES Realworld ² (Mbps)	2100	2250	2800
Maximum recommended connections			
New TCP connections/sec	200,000	200,000	300,000
Concurrent TCP connections	20,000,000	20,000,000	30,000,000
Concurrent IPsec VPN tunnels	4000	4500	5400
Concurrent Access Points	300	400	500
Concurrent REDs (UTM/FW) ⁴	100/400	150/600	200/800

1. 1518 byte packet size (UDP), default rule set

2. Avg. of Data Center, Enterprise Perimeter, Higher Education, European Mobile, Financial Network traffic profiles at 50% CPU Usage

3. HTTP traffic

4. UTM=Full content scanning of RED traffic on XG appliance, FW=packet filtering only

Sophos XG Firewall Software/Virtual Appliances

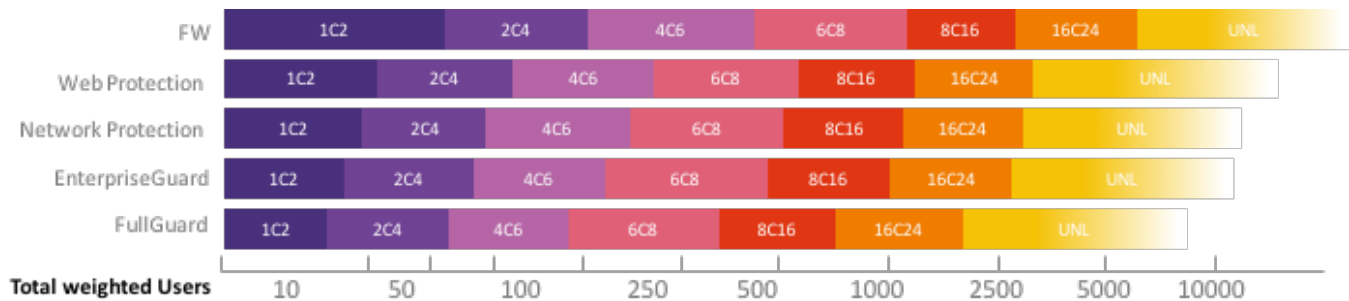
Sophos XG Firewall Software/Virtual Appliances are licenses by numbers of (virtual) cores and (virtual) RAM size. Licenses do not have to match exactly the number of available cores/RAM but will only activate the licensed cores/RAM to be used in the Software.

While the Software/Virtual Appliances might be used on various CPU types with various speeds the performance might vary significantly even if using the same number of cores/RAM size.

The following diagram provides a rough guidance of total weighted user ranges (according to the calculation in chapter 1) recommended for each Software model.

Numbers are based on the following assumptions:

- CPU speed = 2.5 GHz (higher speed can significantly increase throughput for most applications)
- CPU Type = Core I (up to 6C8), Xeon (8C16 and above)



Rule of thumb:

- Using Sophos XG Firewall in a virtual environment has an estimated ~10% performance / user number decrease caused by the Hypervisor framework.

On-site evaluations

While the procedure explained above is a good foundation for selecting the most appropriate model, it is only based on information received from the customer. There are many factors determining the behavior and performance of an appliance which can only be evaluated in a real life scenario. Therefore, an on-site evaluation within the customer's environment is always the best way to determine whether the selected appliance meets the actual performance requirements of the customer. For further assistance, staff within the Sophos pre-sales teams are ready to assist you with sizing and in selecting the right platform.

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