IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

VISION SPHERE LABS, LLC,	§ § § §	
Plaintiff,	§ §	
v.	§ §	Civil Action No. 2:24-cv-1076
GRANDSTREAM NETWORKS, INC.,	§ § §	
Defendant.	§ §	

PLAINTIFF VISION SPHERE LABS, LLC'S
COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Vision Sphere Labs, LLC, (VSL) by and through its attorneys, brings this action and makes the following allegations of patent infringement relating to United States Patent No. 7,769,028 (the "'028 patent") and 7,990,860 (the "'860 patent"). Defendant Grandstream Networks, Inc. ("Grandstream") infringes Plaintiff's '028 and '860 patents in violation of the patent laws of the United States of America, 35 U.S.C. § 1, *et seq*.

PARTIES

1.   Plaintiff VSL is a Texas Limited Liability Company with a place of business at 17350 State Highway 249 STE 220, Houston, Texas, 77064.

2.   Upon information and belief, Defendant Grandstream is a corporation organized and existing under the laws of the State of Delaware, with its principal place of business located at 126 Brookline Avenue, 3rd floor, Boston, MA, 02215. Defendant Grandstream may be served with process through its registered agent Xiang Wei, at 2828 West Parker Road #102, Plano, TX, 75075.

JURISDICTION AND VENUE

3.   This is an action for patent infringement arising under the patent laws of the United States of America, Title 35, United States Code.

4.   This Court has original jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

5.   Upon information and belief, Defendant is subject to this Court's general and/or specific personal jurisdiction because they (a) have committed acts of infringement in the State of Texas as alleged below; and/or (b) are engaged in continuous and systematic activities in the State of Texas.

6.   Venue is proper in this district under 28 U.S.C. § 1400(b). On information and belief, Defendant Grandstream has committed acts of infringement in this District as set forth below. On information and belief, customers purchase and use Defendant Grandstream's Accused Instrumentalities (defined below) in this District.   On information and belief, Defendant Grandstream has sold, and continues to sell, Accused Instrumentalities at brick and mortar stores in Texas, including at 1255 W 15th Street, #600, Plano, TX, 75075, and at other locations in this District.

7.   In particular, Defendant has committed and continues to commit acts of infringement in violation of 35 U.S.C. § 271, and has made, used, marketed, distributed, offered for sale, sold, and/or imported infringing products in the State of Texas, including in this District, and engaged in infringing conduct within and directed at or from this District. For example, Defendant has purposefully and voluntarily placed the Accused Instrumentalities into the stream of commerce with the expectation that the Accused Instrumentalities will be used in this District. The Accused Instrumentalities have been, and continue to be, distributed to and

used in this District. Defendant's acts cause and have caused injury to VSL, including within this District.

THE '028 PATENT

8.   U.S. Patent No. 7,769,028 ("the '028 Patent") is entitled "Systems and methods for adaptive throughput management for event-driven message-based data" and was issued on August 3, 2010. A true and correct copy of the '028 Patent is attached as Exhibit A.

9.   The '028 Patent was filed on June 21, 2006, as U.S. Patent Application No. 11/471,923.

10.   VSL is the owner of all rights, title, and interest in and to the '028 Patent, with the full and exclusive right to bring suit to enforce the '028 Patent, including the right to recover for past infringement.

11.   The '028 Patent is valid and enforceable under United States Patent Laws.

12.   The '028 Patent discloses, among other things, "a method for communicating data including prioritizing data by assigning a priority to the data, analyzing a network to determine a status of the network, and communicating data based at least in part on the priority of the data and the status of the network." Exhibit A at Abstract. The '028 Patent also discloses "Quality of Service (QoS)," which "refers to one or more capabilities of a network to provide various forms of guarantees with regard to data this is carried." *Id.* at 4:16-18. The '028 Patent states that "[t]he primary goal of QoS is to provide priority including dedicated bandwidth, controlled jitter and latency (required by some real-time and interactive traffic), and improved [data] loss characteristics." *Id.* at 4:27-31.

13.   In discussing QoS, the '028 Patent recognized various shortcomings of existing QoS systems. As one example, the '028 Patent states that "[e]xisting QoS systems cannot provide QoS based on message content at the transport layer" of the Open Systems Interconnection (OSI)

seven-layer protocol model. Exhibit A at 5:1-2. Indeed, the '028 Patent explains that the "Transmission Control Protocol (TCP)," which is a protocol at the transport layer, "requires several forms of handshaking and acknowledgements to occur in order to send data," and "[h]igh latency and [data] loss may result in TCP hitting time outs and not being able to send much, if any, meaningful data over [] a network." *Id.* at 1:57-60, 3:53-57. As another example, the '028 Patent states that "[c]urrent approaches to QoS often require every node in a network to support QoS, or at the very least, for every node in the network involved in a particular communication to support QoS," but such approaches to QoS "do[] not scale well because of the large amount of state information that must be maintained at every node and the overhead associated with setting up such connections." *Id.* at 4:35-39, 4:46-49. As yet another example, the '028 Patent states that "[d]ue to the mechanisms existing QoS solutions utilize, messages that look the same to current QoS systems may actually have different priorities based on message content," but "data consumers may require access to high-priority data without being flooded by lower-priority data." *Id.* at 4:61-67.

14.   In discussing the shortcomings of the prior art, the '028 Patent recognized that "[t]here is a need for systems and methods for providing QoS on the edge of a [] data network," and "a need for adaptive, configurable QoS systems and methods in a [] data network." Exhibit A at 5:17-20. The claimed inventions of the '028 Patent provide such systems and methods.

THE INVENTIONS CLAIMED IN THE '028 PATENT WERE NOT WELL-UNDERSTOOD, ROUTINE, OR CONVENTIONAL

15.   Given the state of the art at the time of the inventions of the '028 Patent, including the deficiencies with existing QoS systems for computer networks, the inventive concepts of the '028 Patent cannot be considered to be conventional, well-understood, or routine. *See, e.g.*, Exhibit A at 1:57-60, 3:53-57, 4:35-39, 4:46-49, 4:61-67, 5:1-2, 5:17-20. The '028 Patent discloses, among

other things, an unconventional solution to problems arising in the context of communications

networks that relied on existing QoS systems, namely, that such QoS systems did not scale, were

not adaptive or configurable to different network types or architectures, and could not provide QoS

based on message content at the transport layer, among other deficiencies. *See, e.g.*, *id*.

16.   To address one or more deficiencies with existing QoS systems, the inventions of

the '028 Patent offered a technological solution that facilitated providing an improved technique

for communicating data over a network, which helped to control jitter and latency and improve

data loss, among other benefits. In particular, the inventions of the '028 Patent provided a specific,

unconventional solution for prioritizing data as part of and/or at the top of the transport layer,

dynamically changing rules for assigning priority to data, and communicating data based at least

in part on the priority of the data and the status of the network. *See, e.g.*, *id.* at Claims 1, 13, 17;

7:29-31. In this respect, the inventions of the '028 Patent improved the technical functioning of

computers and computer networks by reciting a specific technique for prioritizing data

communications over a network. *See, e.g.*, *id.* at 4:11-37, 4:57-5:9.

17.   Indeed, it was not well-understood, routine, or conventional at the time of the

invention of the '028 Patent for a communication device to (i) prioritize data by assigning priority

to data, where the prioritization occurs either as part of and/or at the top of the transport layer, (ii)

analyze a network to determine a status of the network, (iii) select a mode based on the status of

the network, (iv) change rules for assigning priority to the data based on the mode, and (v)

communicate the data based at least in part on the priority of the data and the status of the network,

where the data is communicated at a transmission rate metered based at least in part on the status

of the network. *See, e.g.*, Exhibit A at Claim 1. Moreover, it was not well-understood, routine, or

conventional at the time of the invention of the '028 Patent for a communication device to receive

the data at a node on the edge of the network. *See, e.g.*, Exhibit A at Claim 5. It was also not well understood, routine, or conventional at the time of the invention of the '028 Patent for a communication device to receive the data at least in part from an application program and/or communicate the data to an application program. *See, e.g.*, *id.* at Claims 6, 12. Further, it was not well-understood, routine, or conventional at the time of the invention of the '028 Patent for a communication device to assign the priority to the data based at least in part on message content of the data, protocol information of the data, or a user defined rule. *See, e.g.*, *id.* at Claims 7-9.

18.   Additionally, it was not well-understood, routine, or conventional at the time of the invention of the '028 Patent for a communication system to include (i) a data prioritize component adapted to assign a priority to data, where the prioritization occurs either as part of and/or at the top of the transport layer, (ii) a network analysis component adapted to determine a status of the network, (iii) a mode selection component adapted to select a mode based at least on the status of the network, and (iv) a data communications component adapted to communicate the data based at least in part on the priority of the data and the status of the network, where the data prioritization component is adapted to assign priority to the data based on prioritization rules that are selected based on a selected mode, and where the data is communicated at a transmission rate metered based at least in part on the status of the network. *See, e.g.*, Exhibit A at Claims 13, 17. It was also not well-understood, routine, or conventional at the time of the invention of the '028 Patent for a communication system to include a data organization component adapted to organize the data with respect to other data based at least in part on the priority of the data. *See, e.g.*, *id.* at Claim 14.

19.   These are just exemplary reasons why the inventions claimed in the '028 Patent were not well-understood, routine, or conventional at the time of the invention of the '028 Patent.

20.   Consistent with the problems addressed being rooted in QoS systems for computer networks, the '028 Patent's inventions naturally are also rooted in that same technology that cannot be performed solely with pen and paper or in the human mind. Indeed, using pen and paper or a human mind would not only ignore, but would run counter to, the stated technical solution of the '028 Patent noted above and the technical problems that the '028 Patent was specifically designed to address. Likewise, at least because the '028 Patent's claimed inventions address problems rooted in QoS systems for computer networks, these inventions are not merely drawn to longstanding human activities.

THE '860 PATENT

21.   U.S. Patent No. 7,990,860 ("the '860 Patent") is entitled "Method and system for rule-based sequencing for QoS" and was issued on August 2, 2011. A true and correct copy of the '860 Patent is attached as Exhibit B.

22.   The '860 Patent was filed on June 16, 2006, as U.S. Patent Application No.11/454,220.

23.   VSL is the owner of all rights, title, and interest in and to the '860 Patent, with the full and exclusive right to bring suit to enforce the '860 Patent, including the right to recover for past infringement.

24.   The '860 Patent discloses, among other things, "a method for communicating data over a network to provide Quality of Service," including "prioritizing the data, and communicating the data based at least in part on the priority." Exhibit B at Abstract. According to the '860 Patent, "Quality of Service (QoS)" "refers to one or more capabilities of a network to provide various forms of guarantees with regard to data that is carried." *Id.* at 4:16-18. The '860 Patent states that "[t]he primary goal of QoS is to provide priority including dedicated bandwidth, controlled jitter

and latency (required by some real-time and interactive traffic), and improved [data] loss characteristics." *Id.* at 4:27-32.

25.   The '860 Patent is valid and enforceable under United States Patent Laws.

26.   Like the '028 Patent, the '860 Patent recognized various shortcomings of existing QoS systems. As one example, the '860 Patent states that "[e]xisting QoS systems cannot provide QoS based on message content at the transport layer" of the Open Systems Interconnection (OSI) seven-layer protocol model. Exhibit B at 5:2-3. Indeed, the '860 Patent explains that the "Transmission Control Protocol (TCP)," which is a protocol at the transport layer, "requires several forms of handshaking and acknowledgements to occur in order to send data," and "[h]igh latency and [data] loss may result in TCP hitting time outs and not being able to send much, if any, meaningful data over [] a network." *Id.* at 1:57-60, 3:53-57. As another example, the '860 Patent states that "[c]urrent approaches to QoS often require every node in a network to support QoS, or at the very least, for every node in the network involved in a particular communication to support QoS," but such approaches to QoS "do[] not scale well because of the large amount of state information that must be maintained at every node and the overhead associated with setting up such connections." *Id.* at 4:36-39, 4:47-50. As yet another example, the '860 Patent states that "[d]ue to the mechanisms existing QoS solutions utilize, messages that look the same to current QoS systems may actually have different priorities based on message content," but "data consumers may require access to high-priority data without being flooded by lower-priority data." *Id.* at 4:64-5:1

27.   In discussing the shortcomings of the prior art, the '860 Patent recognized that "[t]here is a need for systems and methods for providing QoS on the edge of a [] data network,"

and "a need for adaptive, configurable QoS systems and methods in a [] data network." Exhibit B at 5:19-22. The claimed inventions of the '860 Patent provide such systems and methods.

THE INVENTIONS CLAIMED IN THE '860 PATENT WERE NOT WELL-UNDERSTOOD, ROUTINE, OR CONVENTIONAL

28.   Given the state of the art at the time of the inventions of the '860 Patent, including the deficiencies with existing QoS systems for computer networks, the inventive concepts of the '860 Patent cannot be considered to be conventional, well-understood, or routine. *See, e.g.*, Exhibit B at 1:57-60, 3:53-57, 4:36-39, 4:47-50, 4:64-5:2, 5:19-22. The '860 Patent discloses, among other things, an unconventional solution to problems arising in the context of communications networks that relied on existing QoS systems, namely, that such QoS systems did not scale, were not adaptive or configurable to different network types or architectures, and could not provide QoS based on message content at the transport layer, among other deficiencies. *See, e.g.*, *id.*

29.   To address one or more deficiencies with existing QoS systems, the inventions of the '860 Patent offered a technological solution that facilitated providing an improved technique for communicating data over a network, which helped to control jitter and latency and improve data loss, among other benefits. In particular, the inventions of the '860 Patent provided a specific, unconventional solution for prioritizing data as part of and/or at the top of the transport layer by sequencing the data based at least in part on a user defined rule. *See, e.g.*, *id.* at Abstract, Claims 1, 13, 17. In this respect, the inventions of the '860 Patent improved the technical functioning of computers and computer networks by reciting a specific technique for prioritizing data communications over a network. *See, e.g.*, *id.* at 4:11-37, 4:57-5:9.

30.   Indeed, it was not well-understood, routine, or conventional at the time of the invention of the '860 Patent for a communication device to include (i) a network analysis

component configured to determine a network status from a plurality of network statuses based on analysis of network measurements, and determine at least one of an effective link speed and a link proportion for at least one link, (ii) a mode selection component configured to select a mode from a plurality of modes that corresponds with at least one of the plurality of network statuses based on the determined network status, where each of the plurality of modes comprises a user defined sequencing rule, (iii) a data prioritization component configured to operate at a transport layer of a protocol stack and prioritize the data by assigning a priority to the data, where the prioritization component includes a sequencing component configured to sequence the data based at least in part on the user defined sequencing rule of the selected mode, (iv) a data metering component configured to meter inbound data by shaping the inbound data at the data communications system for the at least one link, and meter outbound data by policing the outbound data at the data communications system for the at least one link, and (v) a data communication component configured to communicate the data based at least in part on the priority of the data, the effective link speed, and/or the link proportion. *See, e.g.*, Exhibit B at Claims 1, 15, 20.

31.   Moreover, it was not well-understood, routine, or conventional at the time of the invention of the '860 Patent for the user defined sequencing rule mentioned above to be dynamically reconfigurable. *See, e.g.*, Exhibit B at Claim 5. It was also not well-understood, routine, or conventional at the time of the invention of the '860 Patent for a communication device to receive the data at least in part from an application program operating on the node, or pass the data at least in part to an application program operating on the node. *See, e.g.*, *id.* at Claims 6, 12. Further, it was not well-understood, routine, or conventional at the time of the invention of the '860 Patent for a communication device to prioritize the data by differentiating the data based at

least in part on message content, protocol information, or a user defined differentiation rule. *See, e.g.*, *id.* at Claims 8-11.

32.   These are just exemplary reasons why the inventions claimed in the '860 Patent were not well-understood, routine, or conventional at the time of the invention of the '860 Patent.

33.   Consistent with the problems addressed being rooted in QoS systems for computer networks, the '860 Patent's inventions naturally are also rooted in that same technology that cannot be performed solely with pen and paper or in the human mind. Indeed, using pen and paper or a human mind would not only ignore the stated technical solution of the '860 Patent noted above and the technical problem that the '860 Patent was specifically designed to address. Likewise, at least because the '860 Patent's claimed inventions address problems rooted in QoS systems for computer networks, these inventions are not merely drawn to longstanding human activities.

COUNT I: INFRINGEMENT OF U.S. PATENT NO. 7,769,028

34.   Plaintiff incorporates paragraphs 1 through 33 as though fully set forth herein.

35.   Defendant Grandstream has infringed and is infringing, either literally or under the doctrine of equivalents, the '028 Patent in violation of 35 U.S.C. § 271 *et seq.*, directly and/or indirectly, by making, using, offering for sale, or selling in the United States, and/or importing into the United States without authority or license, products that operate with the "QoS Traffic Management" feature, which supports numerous Grandstream routers, switches, and/or platforms listed on Grandstream's website (collectively referred to herein as the "Accused '028 Products"), that infringe at least one or more claims of the '028 Patent. *See, e.g.,* https://www.grandstream.com/hubfs/Product_Documentation/GWN7000_QoS_VoIP_Managem ent_Guide_0.pdf.

36.   As just one non-limiting example, set forth below is exemplary evidence of infringement of Claim 13 of the '028 Patent in connection with the Accused '028 Products. This

description is based on publicly available information. VSL reserves the right to modify this description, including, for example, on the basis of information about the Accused '028 Products that it obtains during discovery.

> **13. A system for communicating data, the system including:**
>
> **a data prioritization component adapted to assign a priority to data, wherein the prioritization occurs at least one of:**
> **in a transport layer of a network communications protocol stack of a data communication system, and at a top of the transport layer of the network communications protocol stack of the data communication system**

37.   Grandstream makes, uses, sells, and/or offers to sell a system for communicating data in accordance with Claim 13. For instance, Grandstream makes, uses, sells, and/or offers to sell its GWN7000 series routers that have the QoS Traffic Management feature. This feature prioritizes data communication through the router to optimize for performance and based on user-defined rules.

QUALITY OF SERVICE ON GWN7000

The GWN7000 supports 802.1Q, 802.1p Layer 2 standards allowing to create multiple traffic classes, filter by port, IP address or network groups. Along with the support of DSCP Layer 3 marking and policing features to help shape high downstream traffic.

QoS features are accessible from GWN7000's **WebGUI→ Router→ QoS**

QoS				
Basic	Upstream QoS	Policer		
Interface ▲	Enabled	Upstream	Downstream	Actions
WAN Port 2	✓	20Mbit	300Mbit	📝
WAN Port 1	✓	100Mbit	1000Mbit	📝

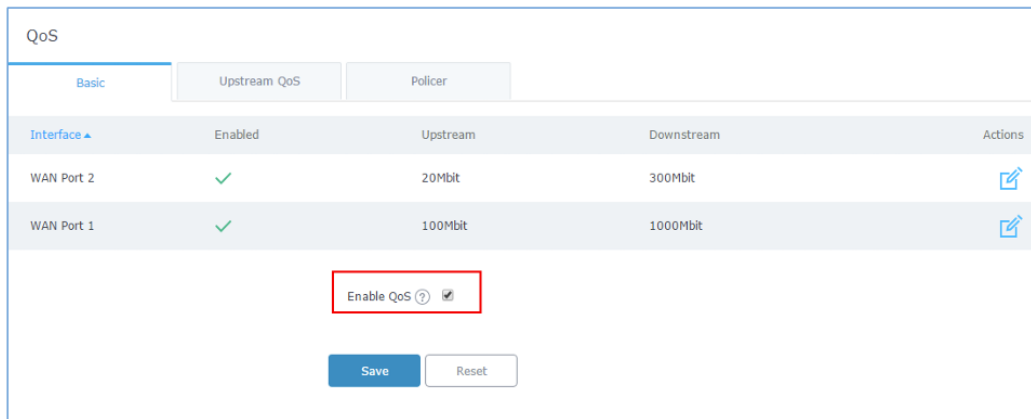Enable QoS ⑦ ☑

Save   Reset

Figure 2: QoS Page

To activate QoS, check "**Enable QoS**". Three tabs are available for configuration:

1. **Global**: To configure download and upload bandwidth speeds settings on each WAN interface.

2. **Upstream QoS**: Upstream QoS allows creating Traffic Classes to prioritize traffic for specific resources on the network by controlling transmission/upload rate. Note that different traffic filters can be created and applied to classes to mark the packet with the DSCP value by respecting following conditions:

   ✓ The total of Upstream bandwidth values of each created class should not exceed the upstream bandwidth value configured in **Global.**

   ✓ The remaining bandwidth will be lent to the class of traffic with the next priority.

   ✓ All filter options are summed together.

3. **Policer**: While Upstream QoS is dealing with traffic transmission, Policer is controlling the incoming traffic. Thus, allowing to create rules to specific targets to set priority and received traffic rate, giving the GWN7000 the ability to drop the exceeding traffic when reaching the configured maximum rate.

See, e.g., https://www.grandstream.com/hubfs/Product_Documentation/GWN7000_ QoS_VoIP_Management_Guide_0.pdf (Emphasis Added).

38.   Additionally, Grandstream's Accused '028 Products include a data prioritization component configured to assign priority to data in either a transport layer or at the top of the transport layer. Specifically, Grandstream details that its QoS feature is used to "[p]rioritize traffic for specific resources on the network by controlling transmission/upload rate." *Id*.

39.   As explained by Grandstream, a user can set rules based on an interface port. Grandstream therefore is utilizing rules based, at least in part, on TCP/UDP port assignments, which are two well-known protocols at the transport layer.

Note: Upstream bandwidth on each created class will be added together and should not surpass the Upstream bandwidth value set in **QoS➔Basic**
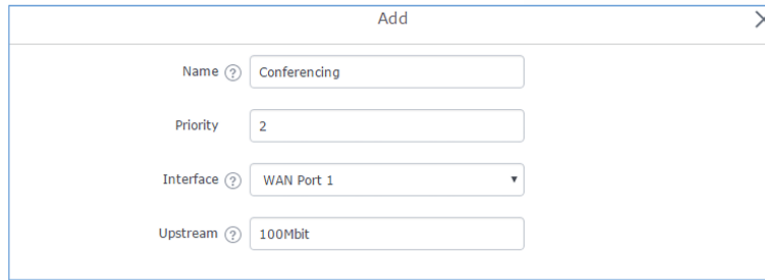

Figure 7: Create Traffic Class

6. After creating the traffic class, users will need to assign this class as Traffic Filter, hence on Traffic Filter section click on "Add" to create a new Traffic Filter.

7. Choose the Class from drop-down menu on "Class" field, in our example, we used Conferencing.

8. Set a Name for the Traffic Filter, and choose the DSCP value (for conferencing purpose, it is advised to use 34 af41).

9. On "IP Source Address", set the device's IP address, in our example, the conferencing System has 192.168.1.238 as IP.

13. (b) a network analysis component adapted to determine a status of a network;

40.   Grandstream's Accused '028 Products are all routers; as such they are capable of determining the status of a network. That said, please see the below figures of displays which show that the routers are capable of determining network status.
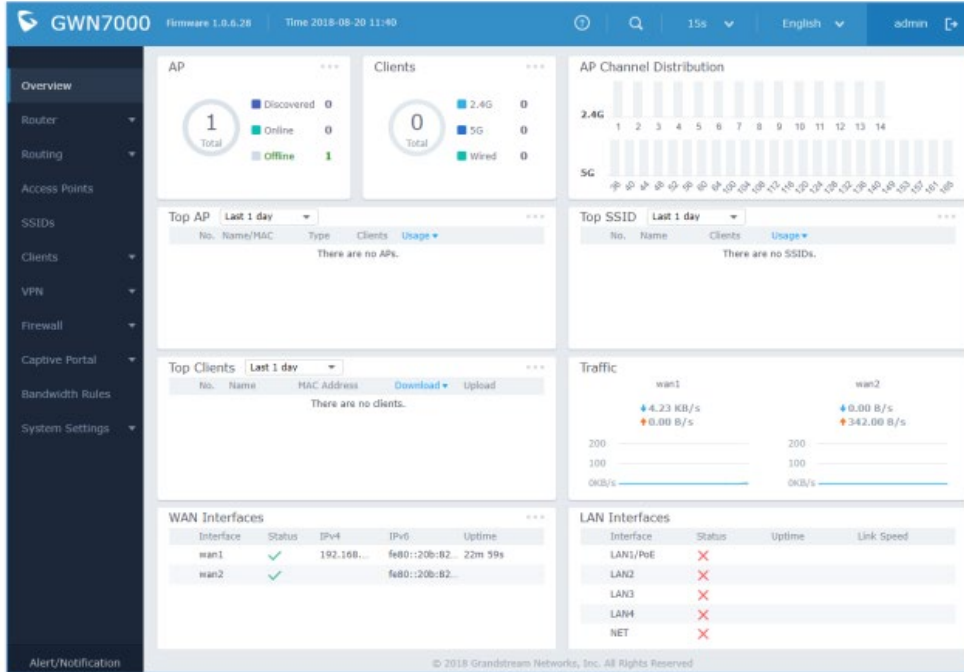
Figure 8: Overview Page

GWN7000 User Manual   P a g e | 26
Version 1.0.9.6

Status

Status page displays **Device Status** to check MAC address, Part Number, Firmware related information and Uptime for the GWN7000; and **WAN Status** showing general information about WAN Ports such as uptime, current throughput, aggregate usage, and IP address and also the application traffic.

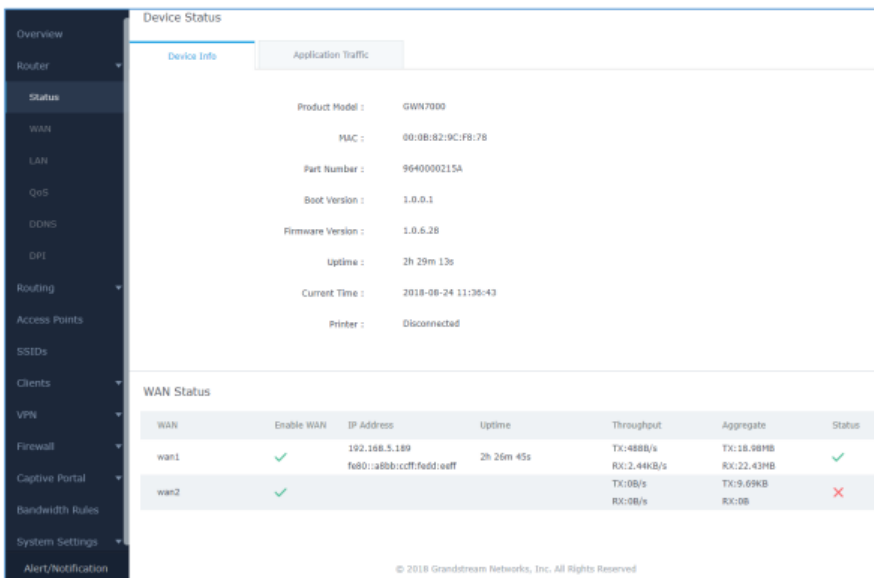Router's Status page can be accessed from **Web GUI → Router → Status**.

Figure 10: Router's Status

PLAINTIFF VISION SPHERE LABS, LLC'S
COMPLAINT FOR PATENT INFRINGEMENT   Page 15

https://www.grandstream.com/hubfs/Product_Documentation/gwn7000_usermanual.pdf

13 (c) a mode selection component adapted to select at least one mode based at least in part on the status of the network;

41.   Grandstream makes, uses, sells, and/or offers to sell a system that comprises a mode selection component adapted to select at least one mode based at least in part on the status of the network. The Grandstream GWN7000 includes the ability of a user to select between at least two modes in order to incorporate its QoS features.

QUALITY OF SERVICE ON GWN7000

The GWN7000 supports 802.1Q, 802.1p Layer 2 standards allowing to create multiple traffic classes, filter by port, IP address or network groups. Along with the support of DSCP Layer 3 marking and policing features to help shape high downstream traffic.

QoS features are accessible from GWN7000's **WebGUI→ Router→ QoS**

QoS				
Basic	Upstream QoS	Policer		
Interface ▲	Enabled	Upstream	Downstream	Actions
WAN Port 2	✓	20Mbit	300Mbit	✎
WAN Port 1	✓	100Mbit	1000Mbit	✎

Enable QoS ⑦ ☑

Save   Reset
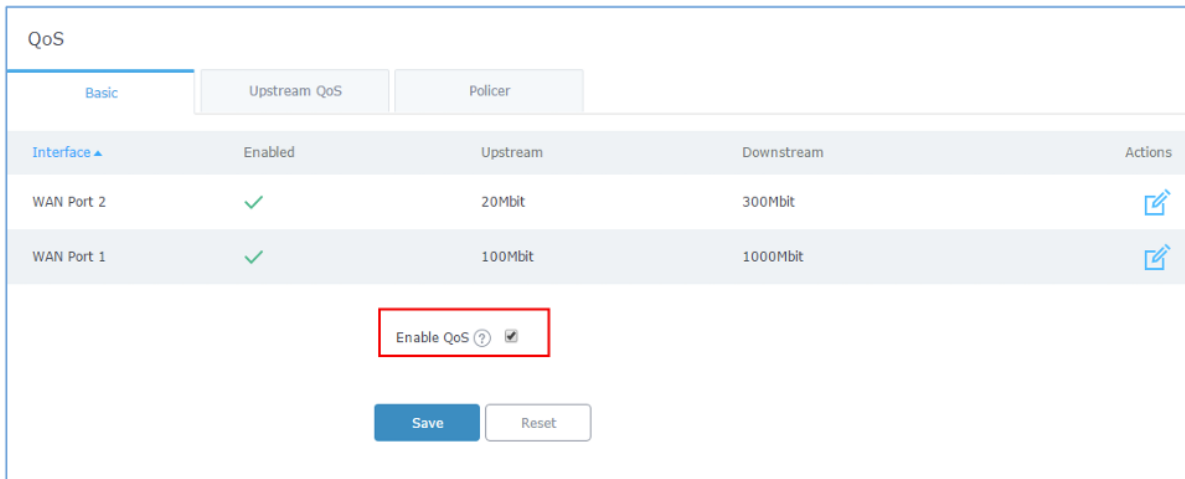
Figure 2: QoS Page

The following tables describe each tab option:

Table 2: QoS Global

Enabled	Check to enable upstream and downstream bandwidth speeds for the selected WAN interface.
Upstream	Set the upstream value to specify the upload bandwidth for selected interface. The value should end with "Mbit", "Kbit" or with no unit if the set value is referring to "bit" unit. **Note**: This value will affect and limit the bandwidth values on created classes on "QoS Upstream". Examples: *500Mbit* *100Kbit* *500*
Downstream	Set downstream value to specify the download bandwidth speed for selected interface. The value should end with "Mbit", "Kbit" or with no unit if the set value is referring to "bit" unit. Examples: *1000Mbit* *100Kbit* *500*

Table 4: QoS Policer

Name	Define a Name for the Policer rule.
Interface	Select an interface from which the traffic will be policed. Make sure to enable the desired interface from "QoS " in order to appear.
Priority	Set the priority of the traffic class. Lower values have higher priority. Valid range is between 1 and 64.
Rate	Set a Rate value for download bandwidth when applying policer rule.
DSCP	Choose the Differentiated Services Code Point (DSCP) value from drop-down list. Default is 0.
IP Source Address	Specify the Source IP address from which the policer rule will be applied.
IP Destination Address	Specify the Destination IP address to which the policer rule will be applied.

https://www.grandstream.com/hubfs/Product_Documentation/GWN7000_QoS_VoIP_Management_Guide_0.pdf

13(d): a data communications component adapted to communicate the data based at least in part on the priority of the data and the status of the network, the data prioritization component being adapted to assign priority to the data based on prioritization rules, wherein the prioritization rules are selected based upon the selected at least one mode, wherein the data is communicated at a transmission rate metered based at least in part on the status of the network.

42.   Grandstream makes, uses, and/or offers to sell a system that comprises a data communications component adapted to communicate the data based at least in part on the priority of the data and the status of the network, where the data prioritization component is adapted to assign priority to the data based on prioritization rules that are selected based upon the selected at least one mode, wherein the data is communicated at a transmission rate metered based at least in part on the status of the network.

QoS Configuration using IP Address

In this section, we will show how to prioritize traffic for a specific IP within GWN7000 Network.
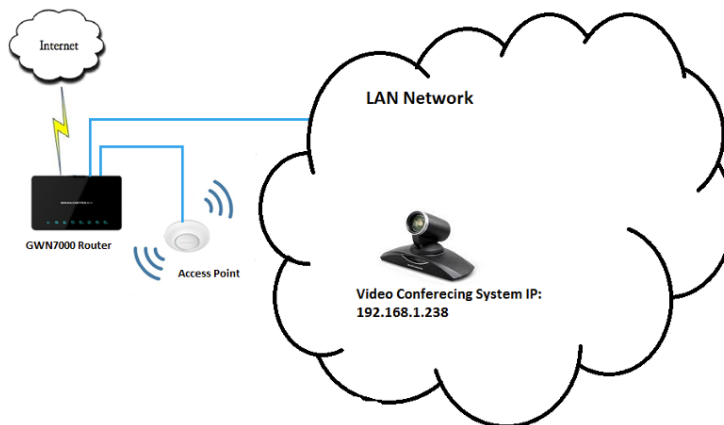
Figure 3: Prioritizing by IP Address

In above example figure, we will prioritize all traffic coming from GVC3200's IP address (Video Conferencing System) regardless of the service or port used on the conferencing System.

See https://www.grandstream.com/hubfs/Product_Documentation/GWN7000_QoS_VoIP_Management_Guide_0.pdf

43.   The Grandstream GWN7000 allows a user to set rules which will prioritize their data based on the mode selected by the user, *i.e.*, whether in non-QoS mode, or QoS enabled mode (in which the prioritization is based on internet bandwidth). *See above.* Prioritization rules may be set by the user as well, and the data is communicated at a rate based at least in part on the status of the network.

44.   Additionally, Defendant Grandstream has been and/or currently is an active inducer of infringement of the '028 Patent under 35 U.S.C. § 271(b) and contributory infringer of the '028 Patent under 35 U.S.C. § 271(c).

45.   Grandstream knew of the '028 Patent, or at least should have known of the '028 Patent, but was willfully blind to its existence. On information and belief, Grandstream has had actual knowledge of the '028 Patent since at least as early as July 15, 2024, the date of correspondence to Grandstream informing it of the inventions disclosed in the '028 Patent.

46.   Grandstream has provided the Accused '028 Products to its customers and, on information and belief, instructions to (i) use the Accused '028 Products in an infringing manner and/or (ii) make an infringing device, while being on notice of (or willfully blind to) the '028 Patent and Grandstream's infringement. Therefore, on information and belief, Grandstream knew or should have known of the '028 Patent and of its own infringing acts, or deliberately took steps to avoid learning of those facts.

47.   Grandstream knowingly and intentionally encourages and aids at least its end-user customers to directly infringe the '028 Patent.

48.   Grandstream's end-user customers directly infringe at least one or more claims of the '028 Patent by using the Accused '028 Products in their intended manner to infringe. Grandstream induces such infringement by providing the Accused '028 Products and instructions

to enable and facilitate infringement, knowing of, or being willfully blind to the existence of, the '028 Patent. On information and belief, Grandstream specifically intends that its actions will result in infringement of one or more claims of the '028 Patent, or subjectively believe that their actions will result in infringement of the '028 Patent, but took deliberate actions to avoid learning of those facts, as set forth above.

49.   Additionally, Grandstream contributorily infringes at least one or more claims of the '028 Patent by providing the Accused '028 Products and/or software components thereof, that embody a material part of the claimed inventions of the '028 Patent, that are known by Grandstream to be specially made or adapted for use in an infringing manner, and are not staple articles with substantial non-infringing uses. The Accused '028 Products are specially designed to infringe at least one or more claims of the '028 Patent, and their accused components have no substantial non-infringing uses. In particular, on information and belief, the software modules and code that implement and perform the infringing functionalities identified above are specially made and adapted to carry out said functionality and do not have any substantial non-infringing uses.

50.   At least as early as the filing and/or service of this Complaint, Grandstream's infringement of the '028 Patent was and continues to be willful and deliberate, entitling VSL to enhanced damages.

51.   Additional allegations regarding Grandstream's knowledge of the '028 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

52.   VSL is in compliance with any applicable marking and/or notice provisions of 35 U.S.C. § 287 with respect to the '028 Patent.

53.   VSL is entitled to recover from Grandstream all damages that VSL has sustained as a result of Grandstream's infringement of the '028 Patent, including, without limitation, a reasonable royalty.

COUNT II: INFRINGEMENT OF U.S. PATENT NO. 7,990,860

54.   Plaintiff incorporates paragraphs 1-53 as though fully set forth herein.

55.   Defendant Grandstream has infringed and is infringing, either literally or under the doctrine of equivalents, the '860 Patent in violation of 35 U.S.C. § 271 *et seq.*, directly and/or indirectly, by making, using, offering for sale, or selling in the United States, and/or importing into the United States without authority or license, products that operate with the "QoS Traffic Management" feature, which supports numerous Grandstream routers, switches, and/or platforms listed on Grandstream's website (collectively referred to herein as the "Accused '860 Products"), that infringe at least one or more claims of the '860 Patent. *See, e.g.,* https://www.grandstream.com/hubfs/Product_Documentation/datasheet_gwn7000_english.pdf.

56.   As just one non-limiting example, set forth below is exemplary evidence of infringement of Claim 15 of the '860 Patent in connection with the Accused '860 Products. This description is based on publicly available information. VSL reserves the right to modify this description, including, for example, on the basis of information about the Accused '860 Products that it obtains during discovery.

15. A processing device for communicating data, the processing device including:

a network analysis component of the processing device configured to:

determine a network status from a plurality of network statuses based on analysis of network measurements, and determine at least one of an effective link speed and a link proportion for at least one link;

57.   Grandstream makes, uses, sells, and/or offers to sell a system for communicating data in accordance with Claim 15. For instance, Grandstream makes, uses, sells, and/or offers to sell sells its GWN7000 series routers that have the QoS Traffic Management feature. This feature prioritizes data communication through the router to optimize for performance.

See, e.g., https://www.grandstream.com/hubfs/Product_Documentation/datasheet _gwn7000_english.pdf

USING QOS TO PRIORITIZE VOIP TRAFFIC

Traffic priority is a way of ensuring that specific applications or sub networks are guaranteed a certain amount of the uplink bandwidth at all times. Traffic priorities only come into play when the network is using all of the pre-configured bandwidth on the uplink.

For VoIP environments, network latency can be a big issue that can be caused by network congestions due to file transfer operations for example. Hence, making audio or video calls very hard to deal with where a delay can make the communication impossible, on the other hand, having a little delay on your downloaded file for example is not very critical to the network.

And since VoIP signaling or voice/video communications are very critical to most Enterprises in the age of Unified Communication, and does not require a very large bandwidth, is it very required to give these types of services a special treatment.

See https://www.grandstream.com/hubfs/Product_Documentation/GWN7000_QoS_VoIP_Management_Guide_0.pdf

58.   Additionally, Grandstream's Accused '860 Products include a network analysis component to determine a network status from a plurality of network statuses based on analysis of network measurements, and determine at least one of an effective link speed and a link proportion for at least one link.
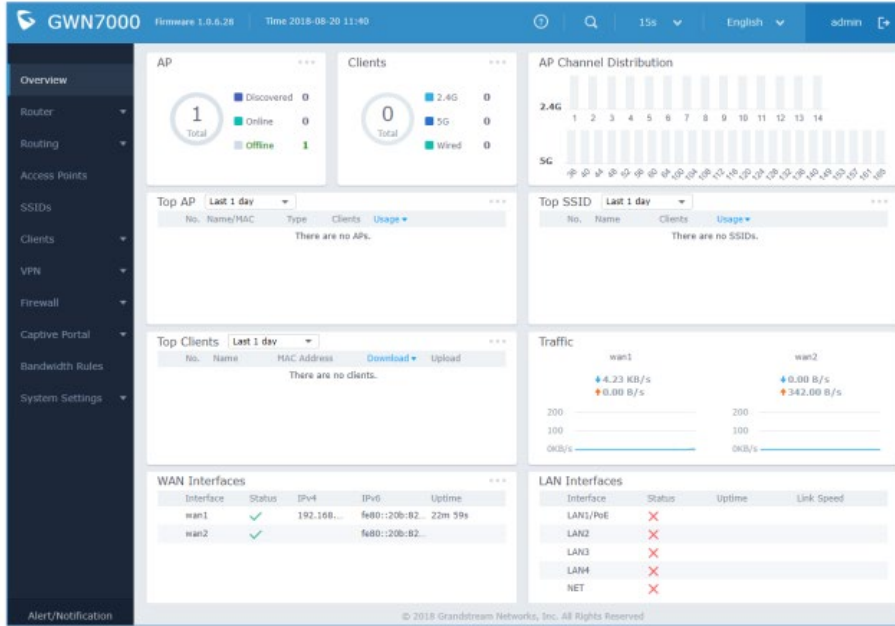
Figure 8: Overview Page

GWN7000 User Manual

Page | 26

Version 1.0.9.6

Status

Status page displays **Device Status** to check MAC address, Part Number, Firmware related information and Uptime for the GWN7000; and **WAN Status** showing general information about WAN Ports such as uptime, current throughput, aggregate usage, and IP address and also the application traffic.

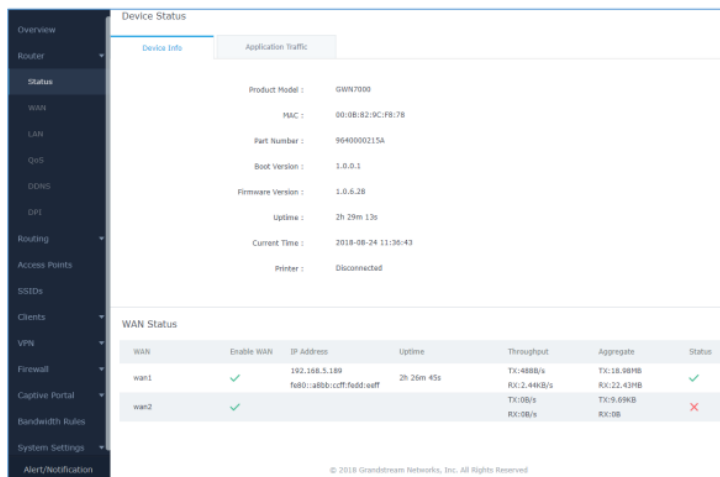Router's Status page can be accessed from **Web GUI ➔ Router ➔ Status**.

Figure 10: Router's Status

See https://www.grandstream.com/hubfs/Product_Documentation/gwn7000_usermanual.pdf

59.   The Grandstream Accused '860 Products (e.g., routers and switches) each determine at least one of an effective link speed and a link proportion for at least one link.

QoS Configuration using IP Address

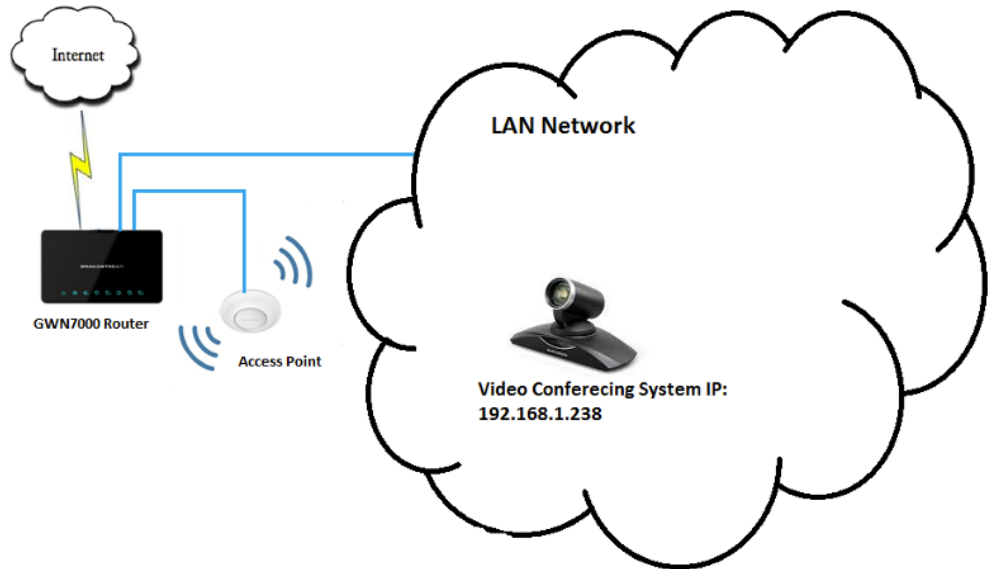In this section, we will show how to prioritize traffic for a specific IP within GWN7000 Network.

Figure 3: Prioritizing by IP Address

In above example figure, we will prioritize all traffic coming from GVC3200's IP address (Video Conferencing System) regardless of the service or port used on the conferencing System.

See https://www.grandstream.com/hubfs/Product_Documentation/GWN7000_ QoS_VoIP _Management_Guide_0.pdf

Table 4: Overview

AP	Shows the number of Access Points that are Discovered, Paired (Online) and Offline. Click on ▫▫▫ to go to Access Points' page for basic and advanced configuration options for the APs
Clients	Shows the total number of connected clients, and a count for clients connected to each Channel. Click on ▫▫▫ to go to Clients page for more options.
AP Channel Distribution	Shows the Channel used for all APs that are paired with this Access Point.
Top AP	Shows the Top APs list, assort the list by number of clients connected to each AP or data usage combining upload and download. Click on ▫▫▫ to go to Access Points page for basic and advanced configuration options for the APs.
Top SSID	Shows the Top SSIDs list, assort the list by number of clients connected to each SSID or data usage combining upload and download. Click on ▫▫▫ to go to SSID page for more options.
Top Clients	Shows the Top Clients list, assort the list of clients by their upload or download. Click on ▫▫▫ to go to Clients page for more options.
Traffic	Shows the sent/received traffic data speeds on both WAN ports.
WAN Interfaces	Shows the status of the wan interfaces (IP, Uptime, status ...etc).
LAN Interfaces	Displays the status of the LAN interfaces, which includes also the NET port. This will display the connection status, the uptime, and the link speeds.

Note that Overview page in addition to other tabs can be updated each 15s, 1min, 2min, 5min or Never by clicking ⌄ in the upper bar menu (Default is 15s).

GWN7000 User Manual
Version 1.0.9.6

Page | 27

See https://www.grandstream.com/hubfs/Product_Documentation/gwn7000_usermanual.pdf.

15(b): a mode selection component of the processing device configured to select a mode from a plurality of modes based on the determined network status, wherein each of the plurality of modes corresponds with at least one of the plurality of network statuses, wherein each of the plurality of modes comprises a user defined sequencing rule;

60.   Grandstream makes, uses, sells, and/or offers to sell a system that comprises a mode selection component configured to select a mode from a plurality of modes based on the determined network status, wherein each of the plurality of modes corresponds with at least one of the plurality of network statuses, wherein each of the plurality of modes comprises a user defined sequencing rule. The Grandstream products include the ability of a user to select between two modes in order to incorporate traffic shaping and rate limits based on a their Traffic Management rules or a category. These rules can be defined by a user.
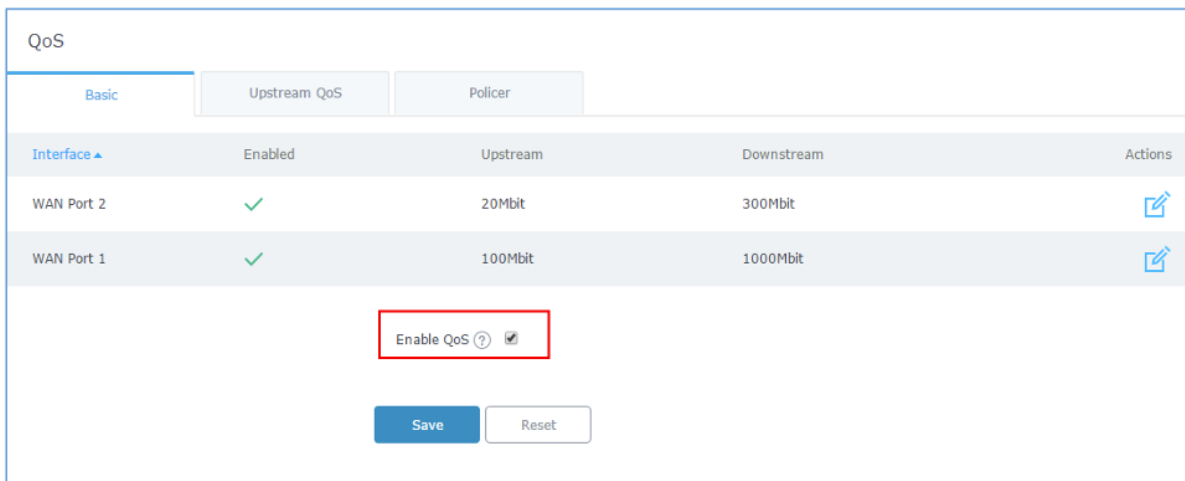

Figure 2: QoS Page

To activate QoS, check "**Enable QoS**". Three tabs are available for configuration:

1. **Global**: To configure download and upload bandwidth speeds settings on each WAN interface.

2. **Upstream QoS**: Upstream QoS allows creating Traffic Classes to prioritize traffic for specific resources on the network by controlling transmission/upload rate. Note that different traffic filters can be created and applied to classes to mark the packet with the DSCP value by respecting following conditions:

   ✓ The total of Upstream bandwidth values of each created class should not exceed the upstream bandwidth value configured in **Global.**

   ✓ The remaining bandwidth will be lent to the class of traffic with the next priority.

   ✓ All filter options are summed together.

3. **Policer**: While Upstream QoS is dealing with traffic transmission, Policer is controlling the incoming traffic. Thus, allowing to create rules to specific targets to set priority and received traffic rate, giving the GWN7000 the ability to drop the exceeding traffic when reaching the configured maximum rate.

The following tables describe each tab option:

Table 2: QoS Global

Enabled	Check to enable upstream and downstream bandwidth speeds for the selected WAN interface.
Upstream	Set the upstream value to specify the upload bandwidth for selected interface. The value should end with "Mbit", "Kbit" or with no unit if the set value is referring to "bit" unit. **Note**: This value will affect and limit the bandwidth values on created classes on "QoS Upstream". Examples: *500Mbit* *100Kbit* *500*
Downstream	Set downstream value to specify the download bandwidth speed for selected interface. The value should end with "Mbit", "Kbit" or with no unit if the set value is referring to "bit" unit. Examples: *1000Mbit* *100Kbit* *500*

Table 4: QoS Policer

Name	Define a Name for the Policer rule.
Interface	Select an interface from which the traffic will be policed. Make sure to enable the desired interface from "QoS " in order to appear.
Priority	Set the priority of the traffic class. Lower values have higher priority. Valid range is between 1 and 64.
Rate	Set a Rate value for download bandwidth when applying policer rule.
DSCP	Choose the Differentiated Services Code Point (DSCP) value from drop-down list. Default is 0.
IP Source Address	Specify the Source IP address from which the policer rule will be applied.
IP Destination Address	Specify the Destination IP address to which the policer rule will be applied.

See https://www.grandstream.com/hubfs/Product_Documentation/GWN7000

QoS_VoIP_Management_Guide_0.pdf

61.   The Grandstream products allow a user to set rules which will prioritize their data based on the mode selected by the user, *i.e.*, whether QoS is enabled, and which of the "Global, Upstream QoS, Policer, and Smart Queue rules are set by the user.
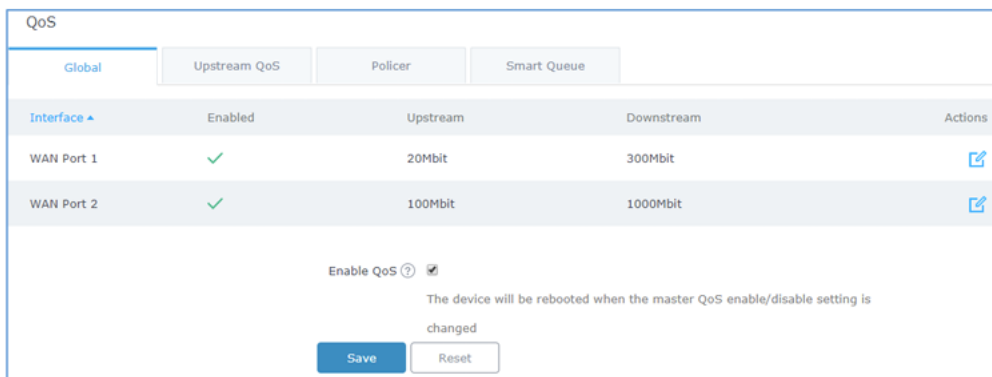
Figure 6: Enable QoS

4. Navigate to **Router→ QoS → Upstream QoS.**

5. On "Traffic Class", click "Add" to create a traffic Class in order to set the priority, choose the WAN Interface set on previous step, and define the Upstream bandwidth value.

PLAINTIFF VISION SPHERE LABS, LLC'S
COMPLAINT FOR PATENT INFRINGEMENT   **Page 29**

> *15(c): a data prioritization component of the processing device configured to prioritize data by assigning a priority to the data, wherein the prioritization component includes a sequencing component configured to sequence the data based at least in part on the user defined sequencing rule of the selected mode;*

62.   Grandstream makes, uses, sells, and/or offers to sell a system that comprises a data prioritization component of the processing device configured to prioritize data by assigning a priority to the data, wherein the prioritization component includes a sequencing component configured to sequence the data based at least in part on the user defined sequencing rule of the selected mode.

63.   As already explained above, The Grandstream products allow a user to set rules which will prioritize their data based on the mode selected by the user, such as whether QoS is enabled, and which of the "Global, Upstream QoS, Policer, and Smart Queue rules are set by the user. *See above.*

> *15(d): a data metering component of the processing device configured to: meter inbound data by shaping the inbound data for the at least one link, and meter outbound data by policing the outbound data for the at least one link; and*

64.   Grandstream makes, uses, sells, and/or offers to sell a system that comprises a data metering component of the processing device configured to meter inbound data by shaping the inbound data for the at least one link, and meter outbound data by policing the outbound data for the at least one link. As has been explained above, Grandstream meters inbound and outbound data and polices outbound data.

Table 3: Upstream QoS

Traffic Class	
Name	Define a name for the traffic class.
Priority	Set the priority of the traffic class. Lower values have higher priority. Valid range is between 1 and 64.
Interface	Select the WAN interface from which the traffic will be classified. Make sure to enable QoS on the desired interface from "QoS " in order to appear.
Upstream	Set Upstream bandwidth value. The value should end with "Mbit", "Kbit" or with no unit if the set value is referring to "bit" unit. **Note**: The sum of created classes should have upstream bandwidth speeds lower than the Upstream bandwidth value configured on "QoS Global". Examples: *100Mbit* *100Kbit* *500*

Table 4: QoS Policer

Name	Define a Name for the Policer rule.
Interface	Select an interface from which the traffic will be policed. Make sure to enable the desired interface from "QoS " in order to appear.
Priority	Set the priority of the traffic class. Lower values have higher priority. Valid range is between 1 and 64.
Rate	Set a Rate value for download bandwidth when applying policer rule.
DSCP	Choose the Differentiated Services Code Point (DSCP) value from drop-down list. Default is 0.
IP Source Address	Specify the Source IP address from which the policer rule will be applied.
IP Destination Address	Specify the Destination IP address to which the policer rule will be applied.

See https://www.grandstream.com/hubfs/Product_Documentation/GWN7000_QoS_VoIP_ Management_Guide_0.pdf.

> *15(e) And a data communication component of the processing device configured to communicate the data based at least in part on at least one of:*

PLAINTIFF VISION SPHERE LABS, LLC'S
COMPLAINT FOR PATENT INFRINGEMENT   **Page 31**

the priority of the data, the effective link speed, and the link proportion, wherein at least the data prioritization component is configured to operate at a transport layer of a protocol stack.

65.   Grandstream makes, uses, sells, and/or offers to sell a system that comprises a data communication component of the processing device configured to communicate the data based at least in part on at least one of the priority of the data, the effective link speed, and the link proportion, wherein at least the data prioritization component is configured to operate at a transport layer of a protocol stack.

66.   As noted above, Grandstream's Accused '860 Products can communicate data based on the priority of the data (when using user-defined priority rules) or simply by effective link speed.

67.   Also as explained above, Grandstream's Accused '860 Products are configured to assign priority to data in either a transport layer or at the top of the transport layer. See above at Paragraph 39.

68.   Additionally, Defendant Grandstream has been and/or currently is an active inducer of infringement of the '860 Patent under 35 U.S.C. § 271(b) and contributory infringer of the '860 Patent under 35 U.S.C. § 271(c).

69.   Grandstream knew of the '860 Patent, or at least should have known of the '860 Patent, but was willfully blind to its existence. On information and belief, Grandstream has had actual knowledge of the '860 Patent since at least as early as July 15, 2024, the date of correspondence to Grandstream informing it of the inventions disclosed in the '860 Patent.

70.   Grandstream has provided the Accused '860 Products to its customers and, on information and belief, instructions to (i) use the Accused '860 Products in an infringing manner and/or (ii) make an infringing device, while being on notice of (or willfully blind to) the '860

Patent and Grandstream's infringement. Therefore, on information and belief, Grandstream knew or should have known of the '860 Patent and of its own infringing acts, or deliberately took steps to avoid learning of those facts.

71.   Grandstream knowingly and intentionally encourages and aids at least its end-user customers to directly infringe the '860 Patent.

72.   Grandstream's end-user customers directly infringe at least one or more claims of the '028 Patent by using the Accused '860 Products in their intended manner to infringe. Grandstream induces such infringement by providing the Accused '860 Products and instructions to enable and facilitate infringement, knowing of, or being willfully blind to the existence of, the '860 Patent. On information and belief, Grandstream specifically intends that its actions will result in infringement of one or more claims of the '860 Patent, or subjectively believe that their actions will result in infringement of the '860 Patent, but took deliberate actions to avoid learning of those facts, as set forth above.

73.   Additionally, Grandstream contributorily infringes at least one or more claims of the '028 Patent by providing the Accused '860 Products and/or software components thereof, that embody a material part of the claimed inventions of the '860 Patent, that are known by Grandstream to be specially made or adapted for use in an infringing manner, and are not staple articles with substantial non-infringing uses. The Accused '860 Products are specially designed to infringe at least one or more claims of the '860 Patent, and their accused components have no substantial non-infringing uses. In particular, on information and belief, the software modules and code that implement and perform the infringing functionalities identified above are specially made and adapted to carry out said functionality and do not have any substantial non-infringing uses.

74.   At least as early as the filing and/or service of this Complaint, Grandstream's infringement of the '860 Patent was and continues to be willful and deliberate, entitling VSL to enhanced damages.

75.   Additional allegations regarding Grandstream's knowledge of the '860 Patent and willful infringement will likely have evidentiary support after a reasonable opportunity for discovery.

76.   VSL is in compliance with any applicable marking and/or notice provisions of 35 U.S.C. § 287 with respect to the '860 Patent.

77.   VSL is entitled to recover from Grandstream all damages that VSL has sustained as a result of Grandstream's infringement of the '028 Patent, including, without limitation, a reasonable royalty.

78.   The limitation of damages provision of 35 U.S.C. § 287(a) is not applicable to Plaintiff.

DEMAND FOR JURY TRIAL

Plaintiff, under Rule 38 of the Federal Rules of Civil Procedure, requests a trial by jury of any issues so triable.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff requests the following relief:

(a)   A judgment in favor of Plaintiff that Defendant has directly infringed and/or has indirectly infringed by way of inducement of one or more claims of the Asserted Patents;

(b)   A judgment and order requiring Defendant to pay Plaintiff damages adequate to compensate for infringement under 35 U.S.C. § 284, which damages may include lost profits but in no event shall be less than a reasonable royalty for their usage made of the inventions of the

Asserted Patents, including pre- and post-judgment interest and costs, including expenses and disbursements;

(c)   A judgment awarding treble damages against Defendant for willful infringement pursuant to 35 U.S.C. § 284;

(d)   A judgment awarding Plaintiff its costs as provided under Fed. R. Civ. P. 54(d)(1);

(e)   A judgment for pre- and post-judgment interest on all damages awarded;

(f)   A judgment awarding Plaintiff post-judgment royalties; and

(g)   Any and all such further necessary or proper relief as this Court may deem just and equitable.

Dated: December 30, 2024

Respectfully submitted,

BUETHER JOE & COUNSELORS, LLC

By: */s/ Christopher M. Joe*
      Christopher M. Joe
      State Bar No. 00787770
      Chris.Joe@BJCIPLaw.com
      Michael W. Doell
      State Bar No. 24127525
      Mike.Doell@BJCIPLaw.com

      1700 Pacific Avenue, Suite 4750
      Dallas, Texas 75201
      Telephone: (214) 466-1272
      Facsimile: (214) 635-1828

ATTORNEY FOR PLAINTIFF
VISION SPHERE LABS, LLC