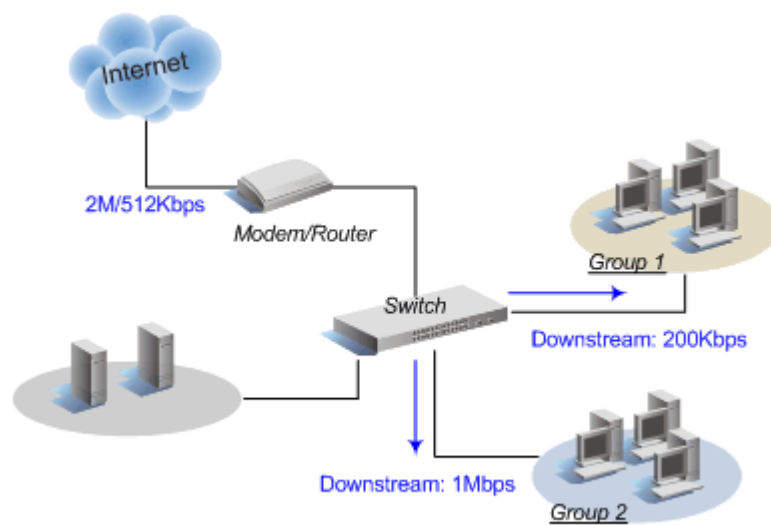


Bandwidth Control

By limiting egress speed on specified ports of switch, it is allowed to control bandwidth occupied by specified clients that are connected to the switch.

DESCRIPTION

Total bandwidth to Internet is so limited and it is necessary to control bandwidth for unprivileged clients that even use P2P software stealthily. As the figure demonstrated, the unprivileged users without limit to access the switch are grouped to Group 1. They share the configured bandwidth, say 200Kbps or more, but won't seize all available bandwidth. As for Group 2, they are limited to 1Mbps rate, but only specified clients that are configured by MAC have the authority.



For the implementation, we could take [SP1658A](#) as the switch that supports bandwidth/rate control and MAC Lock (filtering) functions. Please refer to the Selection Guide [Enterprise Switch](#) or [Enterprise Management Switch](#) for other available models.

CONFIGURATION

Step 1. Setup Port-based Bandwidth/Rate Control

Go to "Port Control" configuration page, and setup Egress Rate on the ports that Group 1/2 members connect to.

Port	State	Negotiation	Speed	Duplex	Flow Control		Rate Control (100K)		Priority	Security
					Full	Half	Ingress	Egress		
PORT17 PORT18 PORT19 PORT20	Enable	Auto	100	Full	Enable	Enable	0	2	Disable	<input type="checkbox"/>

Port	State	Negotiation	Speed	Duplex	Flow Control		Rate Control (100K)		Priority	Security
					Full	Half	Ingress	Egress		
PORT9 PORT10 PORT11 PORT12	Enable	Auto	100	Full	Enable	Enable	0	10	Disable	<input checked="" type="checkbox"/>

Step 2. Setup MAC Lock for privileged users

Go to "Port Control" configuration page, and enable "Security" to stop learning MAC entry on the ports that Group 2 members connect to.

Port	State	Negotiation	Speed	Duplex	Flow Control		Rate Control (100K)		Priority	Security
					Full	Half	Ingress	Egress		
PORT9 PORT10 PORT11 PORT12	Enable	Auto	100	Full	Enable	Enable	0	10	Disable	<input checked="" type="checkbox"/>

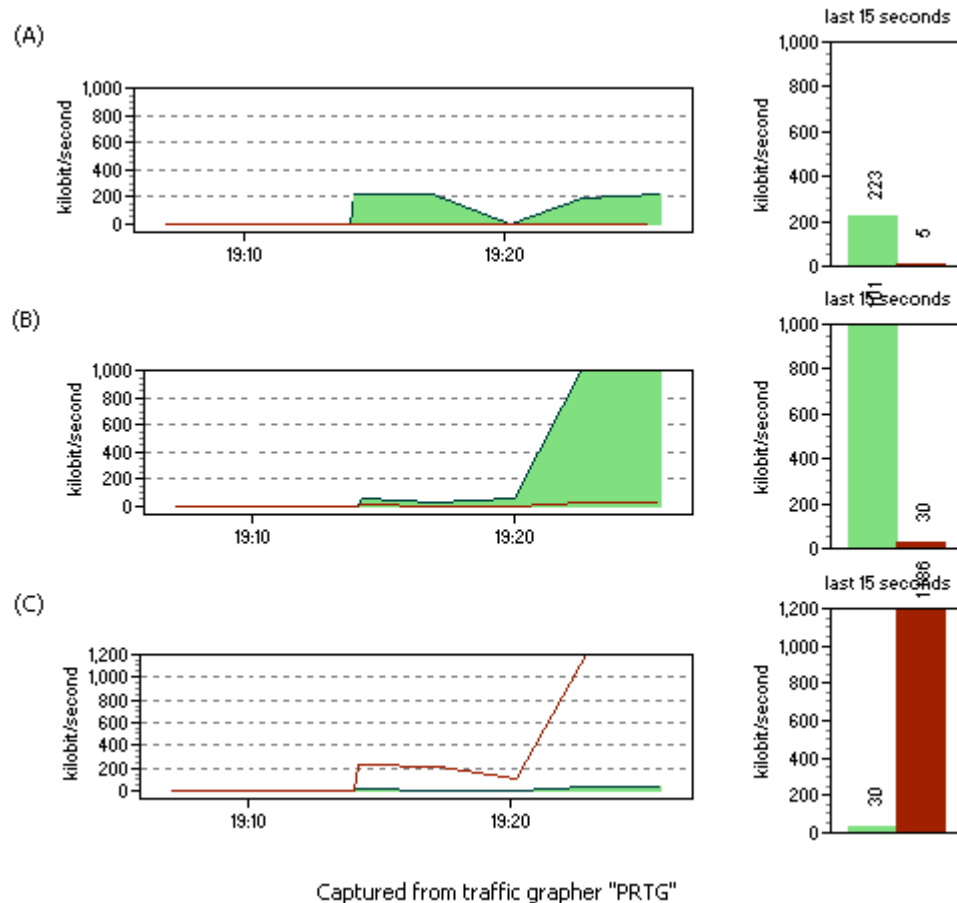
Then, only specified clients that are manually configured MAC entries have authority to access the network.

MAC Address	PORT	VID
00113b111111	PORT9	0
00113b222222	PORT9	0
00113b333333	PORT9	0

Mac Address
 Port num

VERIFICATION

TCP uses an implicit feedback based window flow control mechanism. The window size is increased on receipt of an acknowledgement and decreased on detection of a packet loss. Therefore, limited bandwidth is configured on a port of switch and traffic rate for the TCP connection would shrink, since congestion occurs and packets are lost in the network. Now, traffic loading is monitored on the ports that connect clients and WAN port of router, while clients of Group 1 and Group 2 download files. Port to Group 1 is limited to about 200Kbps rate (see Figure. A) for unprivileged users, and port to Group 2 is about 1Mbps rate (see Figure. B) for privileged users. Router is not configured for the rate on WAN port (see Figure. C). Clearly, occupied bandwidth on WAN port of router is limited to about 200Kbps when only clients of Group 1 access the resource on Internet.



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