

## T: Konfiguracja funkcji gwarantowania jakości usług QoS.

### Zadanie 1:

Wykorzystując serwis internetowy Wikipedii odszukaj informacje na temat standardu 802.1P oraz QoS (ang. Quality of Service).

IEEE 802.1p to standard wykorzystujący 3-bitową część nagłówka pakietu ethernetowego, aby określić każdemu pakietowi konkretny poziom priorytetu na lokalnym łączu danych. W standardzie 802.1p zostały zdefiniowane następujące priorytety:

0 – Background (BK).

1 – Normalny ruch sieciowy (Default).

2 – Ruch sieciowy niekrytyczny czasowo (Best Effort, BE).

3 – Ruch sieciowy o najwyższym priorytecie (Excellent Effort, EE).

4 – Controlled Load (CL).

5 – Video (<100 ms opóźnienia).

6 – Voice (<10 ms opóźnienia).

7 – Wewnętrzne ramki kontrolne (Network Control, NC).

Poziom priorytetu określa jak dana ramka danych ma być traktowana w porównaniu do innych ramek. Im wyższy priorytet danej ramki tym szybciej jest ona przesyłana dalej.

Technika QoS (ang. Quality of Service) czyli mechanizm jakości usługi oznacza zdolność sieci do zapewnienia lepszych usług wybranym typom ruchu sieciowego. Głównym celem QoS jest zapewnienie pierwszeństwa konkretnemu ruchowi, co minimalizuje fluktuacje i opóźnienia (co może mieć wpływ na działanie interaktywnych lub pracujących w czasie rzeczywistym aplikacji). Funkcja QoS może również zapewnić aplikacjom odpowiednią prędkość połączenia.

QoS jest również znana jako klasa usług CoS używana w standardzie 802.1Q.

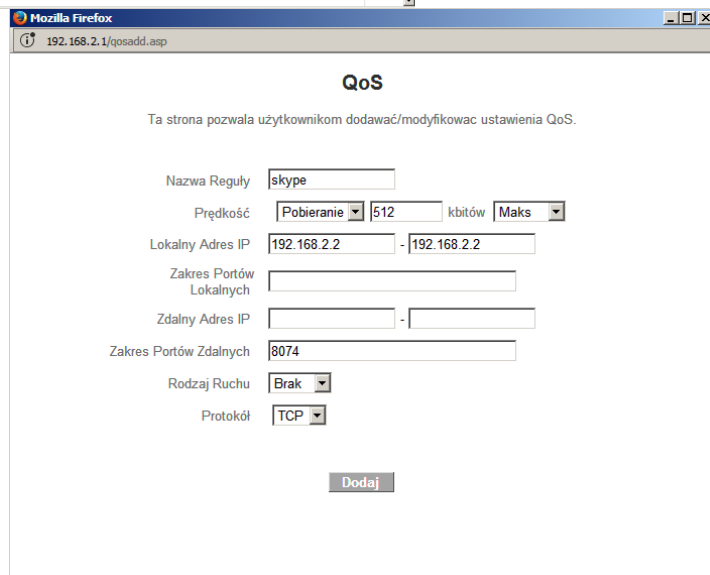
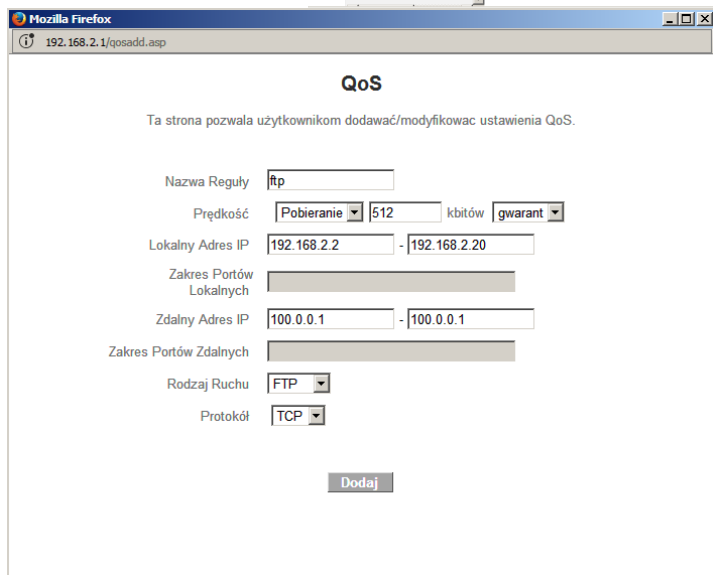
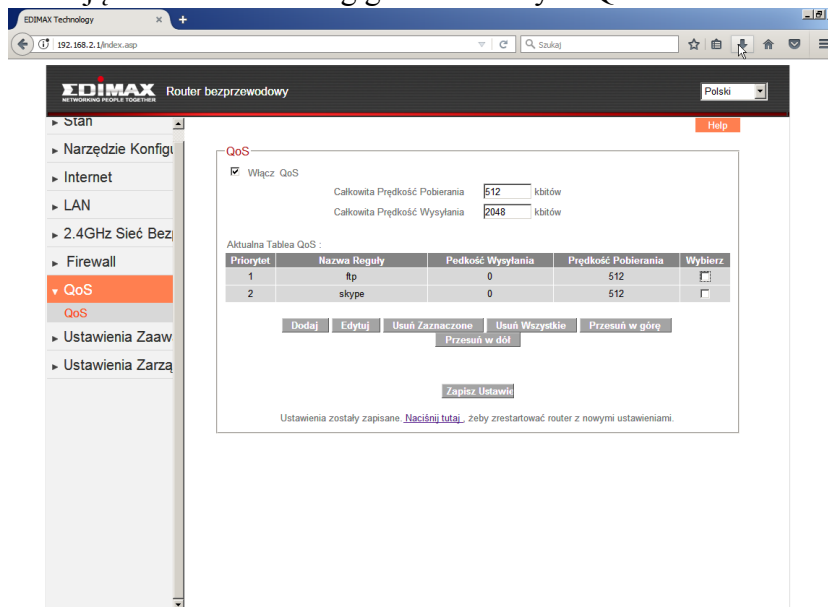
Zrzuty ekranowe przedstawiające ustawienia usług gwarantowanych QoS w przełączniku TP-Link TL-SG3216:

Select	port	Priority Queue	LAG
<input type="checkbox"/>	port 1	4(Highest)	---
<input type="checkbox"/>	port 2	3(Medium)	---
<input type="checkbox"/>	port 3	3(Medium)	---
<input type="checkbox"/>	port 4	2(Normal)	---
<input type="checkbox"/>	port 5	2(Normal)	---
<input type="checkbox"/>	port 6	1(Lowest)	---
<input type="checkbox"/>	port 7	1(Lowest)	---
<input type="checkbox"/>	port 8	1(Lowest)	---

Select	Port	Ingress Rate(Kbps)	Egress Rate(Kbps)	LAG
<input type="checkbox"/>	port 1	Unlimited	Unlimited	---
<input type="checkbox"/>	port 2	128	512	---
<input type="checkbox"/>	port 3	128	512	---
<input type="checkbox"/>	port 4	2048	128	---
<input type="checkbox"/>	port 5	2048	128	---
<input type="checkbox"/>	port 6	256	64	---
<input type="checkbox"/>	port 7	256	64	---
<input type="checkbox"/>	port 8	Unlimited	Unlimited	---

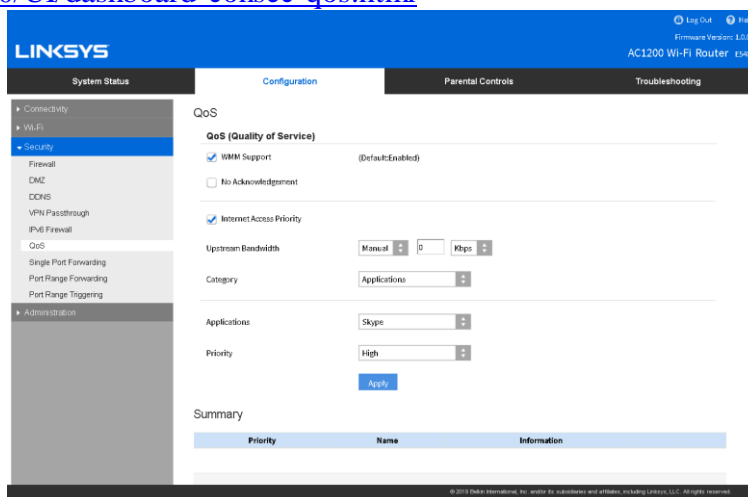
Note: If you select "Manual" to set Ingress/Egress rate, the system will automatically select integral multiple of 64Kbps that closest to the rate you entered as the real Ingress/Egress rate. The range of input is 1-1000000(Kbps).

Zrzuty ekranowe przedstawiające ustawienia usług gwarantowanych QoS w routerze Edimax BR-6228nS:



Przykład konfiguracji routera Linksys:

<http://ui.linksys.com/E5400/UI/dashboard-consec-qos.html>



Zrzuty ekranowe przedstawiające ustawienia usług gwarantowanych QoS w przełączniku TP-Link TL-SG3216:

The screenshot shows the 'Port Priority' configuration page for a TP-LINK TL-SG3216 switch. The browser address bar shows '192.168.9.1'. The left sidebar contains a navigation menu with options like System, Switching, VLAN, Spanning Tree, Multicast, QoS, DiffServ, Bandwidth Control, Voice VLAN, ACL, Network Security, SNMP, Cluster, Maintenance, Save Config, and Logout. The main content area is titled 'Port Priority Config' and features a table with columns for 'Select', 'Port', 'Priority', and 'LAG'. The 'Priority' column is set to 'CoS 0' for all ports. Below the table are 'Apply' and 'Help' buttons. A note at the bottom states: 'Port priority is one property of the port. When the port priority is specified, the data will be classified into the egress queue based on the CoS value of the ingress port and the mapping relation between the CoS and TC in 802.1P/CoS mapping.'

Opis:

The screenshot shows the 'DSCP Priority' configuration page. The 'DSCP Priority' section has radio buttons for 'Enable' and 'Disable', with 'Disable' selected. Below this is the 'Priority Level' section, which includes two dropdown menus for 'DSCP' and 'Priority'. A table maps DSCP values to CoS values and then to Priority levels. The table has columns for DSCP, Priority, DSCP, and Priority. The mapping is as follows:

DSCP	Priority	DSCP	Priority
0	CoS0	1	CoS0
2	CoS0	3	CoS0
4	CoS0	5	CoS0
6	CoS0	7	CoS0
8	CoS1	9	CoS1
10	CoS1	11	CoS1
12	CoS1	13	CoS1
14	CoS1	15	CoS1
16	CoS2	17	CoS2
18	CoS2	19	CoS2

'Apply' and 'Help' buttons are located below the table. A note at the bottom states: 'If the DSCP mapped to priority is selected, IP datagram will be mapped to different priority levels based on the mapping relation between the CoS and TC in 802.1P.'

Opis:

The screenshot shows the 'Priority and CoS-mapping' configuration page. It features two dropdown menus for 'Tag-id/CoS-id' and 'Queue TC-id'. Below these is a table mapping Tag-id/CoS-id to Queue TC-id. The table has columns for Tag-id/CoS-id and Queue TC-id. The mapping is as follows:

Tag-id/CoS-id	Queue TC-id	Tag-id/CoS-id	Queue TC-id
0	TC1	1	TC0
2	TC0	3	TC1
4	TC2	5	TC2
6	TC3	7	TC3

'Apply' and 'Help' buttons are located below the table. A note at the bottom states: 'Among the Queue TC-id TC0,TC1...TC3, the bigger value, the higher priority.'

Opis:

The screenshot shows the TP-LINK TL-SG3216 web interface. The browser address bar shows 192.168.9.1. The page title is "TP-LINK TL-SG3216". The navigation menu includes System, Switching, VLAN, Spanning Tree, Multicast, QoS, DiffServ, Bandwidth Control, Voice VLAN, ACL, Network Security, SNMP, Cluster, Maintenance, Save Config, and Logout. The "Schedule Mode" tab is selected, and the "Schedule Mode Config" section is visible. The "Schedule Mode" is set to "Equ-Mode". There are "Apply" and "Help" buttons.

Wskazanie gwarantowanego pasma transmisji dla poszczególnych portów przełącznika:

The screenshot shows the TP-LINK TL-SG3216 web interface. The browser address bar shows 192.168.9.1. The page title is "TP-LINK TL-SG3216". The navigation menu is the same as in the previous screenshot. The "Rate Limit" tab is selected, and the "Rate Limit Config" section is visible. The "Port" dropdown is set to "1". The "Ingress Rate(Kbps)" is set to "128" and the "Egress Rate(Kbps)" is set to "1024". There are "Apply" and "Help" buttons.

Select	Port	Ingress Rate(Kbps)	Egress Rate(Kbps)	LAG
<input type="checkbox"/>	1	128	1024	---
<input type="checkbox"/>	2	---	---	---
<input type="checkbox"/>	3	---	---	---
<input type="checkbox"/>	4	---	---	---
<input type="checkbox"/>	5	---	---	---
<input type="checkbox"/>	6	---	---	---
<input type="checkbox"/>	7	---	---	---
<input type="checkbox"/>	8	---	---	---
<input type="checkbox"/>	9	---	---	---
<input type="checkbox"/>	10	---	---	---
<input type="checkbox"/>	11	---	---	---
<input type="checkbox"/>	12	---	---	---

Note:  
 1. For one port, you cannot enable the Storm Control and the Ingress rate control at the same time.  
 2. If you select "Manual" to set Ingress/Egress rate, the system will automatically select integral multiple of 64Kbps that closest to the rate you entered as the real Ingress/Egress rate.

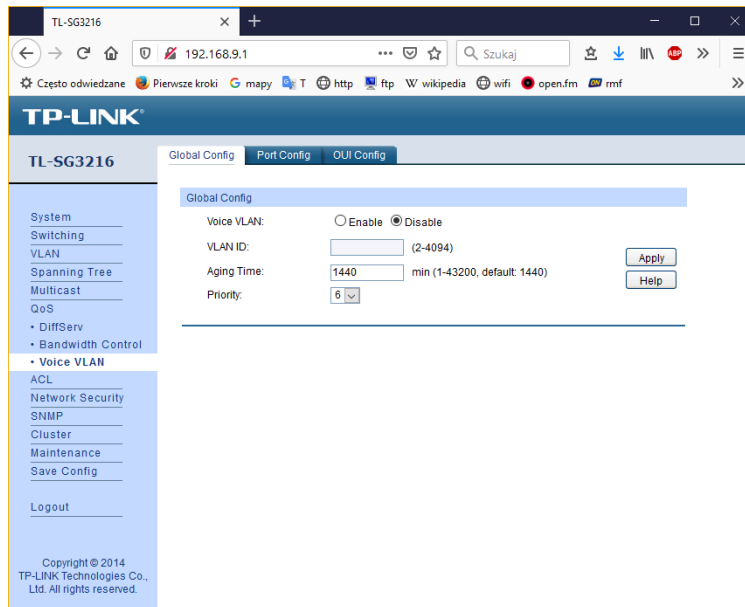
Wskazanie pasma rozgłaszania dla poszczególnych portów przełącznika:

The screenshot shows the TP-LINK TL-SG3216 web interface. The browser address bar shows 192.168.9.1. The page title is "TP-LINK TL-SG3216". The navigation menu is the same as in the previous screenshots. The "Storm Control" tab is selected, and the "Storm Control Config" section is visible. The "Port" dropdown is set to "1". The "Broadcast Rate(bps)" is set to "128K", the "Multicast Rate(bps)" is set to "128K", and the "UL-Frame Rate(bps)" is set to "128K". There are "Apply" and "Help" buttons.

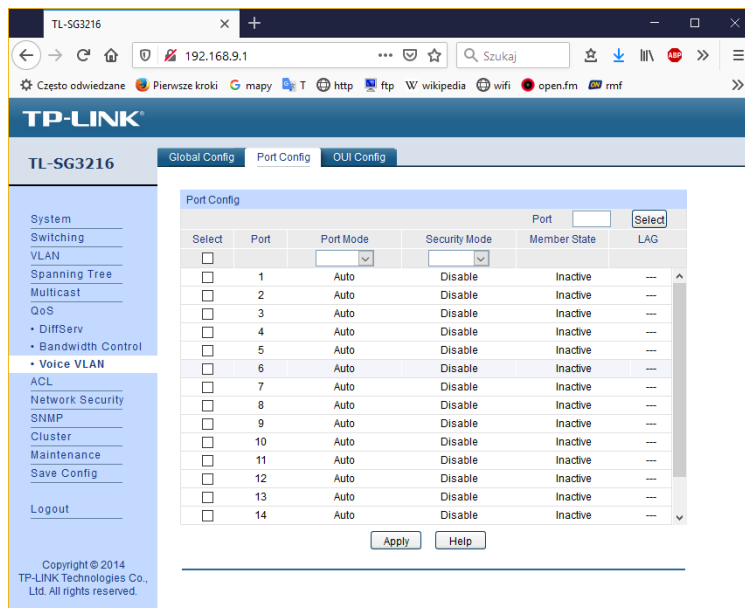
Select	Port	Broadcast Rate(bps)	Multicast Rate(bps)	UL-Frame Rate(bps)	LAG
<input type="checkbox"/>	1	128K	128K	128K	---
<input type="checkbox"/>	2	---	---	---	---
<input type="checkbox"/>	3	---	---	---	---
<input type="checkbox"/>	4	---	---	---	---
<input type="checkbox"/>	5	---	---	---	---
<input type="checkbox"/>	6	---	---	---	---
<input type="checkbox"/>	7	---	---	---	---
<input type="checkbox"/>	8	---	---	---	---
<input type="checkbox"/>	9	---	---	---	---
<input type="checkbox"/>	10	---	---	---	---
<input type="checkbox"/>	11	---	---	---	---
<input type="checkbox"/>	12	---	---	---	---

Note:  
 For one port, you cannot enable the Storm Control and the Ingress rate control at the same time.

Opis:



Opis:



Opis:

