

TCC Exatas Thiago - Algoritmo dinâmico de compartilhamento de banda

Luciano Jerez Chaves

Novembro 2020

1 Descrição

Table 1: Notação.

Significado	Símbolo
Montante de banda extra	ξ
Montante de banda extra retirada que estava de fato em uso	ξ_u
Banda de garantia	β
Conjunto de enlaces	\mathcal{L}
Conjunto de slices dispostos a compartilhar banda	\mathcal{S}'
Banda extra de um slice	$E(\ell, s)$
Indicador do uso de banda de um slice	$U(\ell, s)$
Média agregada da banda efetivamente em uso de um enlace	$U'(\ell)$
Quota de um slice	$Q(\ell, s)$
Banda máxima que pode ser usada por todos os slices em \mathcal{S}'	$Q'(\ell)$
Indicador de banda ociosa do slice	$I(\ell, s)$
Indicador de banda ociosa do enlace	$I'(\ell)$

Algorithm .1: Extra bit rate adjustment

inputs : The current extra bit rate $E(\ell, s), \forall(\ell, s) \in \mathcal{L} \times \mathcal{S}'$
The bit rate indicators $U(\ell, s)$ and $Q(\ell, s), \forall(\ell, s) \in \mathcal{L} \times \mathcal{S}'$
output: The updated extra bit rate $E(\ell, s), \forall(\ell, s) \in \mathcal{L} \times \mathcal{S}'$

```
1 begin
2   foreach transport link  $\ell \in \mathcal{L}$  do
3      $Q'(\ell) \leftarrow 0$  /* Monitor link usage */
4      $U'(\ell) \leftarrow 0$ 
5     foreach slice  $s \in \mathcal{S}'$  do
6        $Q'(\ell) \leftarrow Q'(\ell) + Q(\ell, s)$ 
7        $U'(\ell) \leftarrow U'(\ell) + U(\ell, s)$ 
8     if spare bit rate usage is active then
9        $Q'(\ell) \leftarrow Q'(\ell) + S(\ell)$ 
10     $I'(\ell) \leftarrow Q'(\ell) - U'(\ell) - \beta$ 
11    if  $I'(\ell) \geq 0$  then /* Distribute extra bit rate */
12      foreach slice  $s \in \mathcal{S}'$  in decreasing priority order do
13         $I(\ell, s) \leftarrow Q(\ell, s) - U(\ell, s) + E(\ell, s)$ 
14        if  $I(\ell, s) < \xi \div 2$  and  $I'(\ell) \geq \xi$  then
15           $E(\ell, s) \leftarrow E(\ell, s) + \xi$ 
16           $I'(\ell) \leftarrow I'(\ell) - \xi$ 
17        else if  $I(\ell, s) > 2 \cdot \xi$  and  $E(\ell, s) \geq \xi$  then
18           $E(\ell, s) \leftarrow E(\ell, s) - \xi$ 
19      else /* Collect extra bit rate */
20        foreach slice  $s \in \mathcal{S}'$  do
21           $I(\ell, s) \leftarrow Q(\ell, s) - U(\ell, s) + E(\ell, s)$ 
22          while  $I(\ell, s) \geq \xi$  and  $E(\ell, s) \geq \xi$  do
23             $I(\ell, s) \leftarrow I(\ell, s) - \xi$ 
24             $E(\ell, s) \leftarrow E(\ell, s) - \xi$ 
25          foreach slice  $s \in \mathcal{S}'$  in increasing priority order do
26            while  $I'(\ell) < 0$  and  $E(\ell, s) \geq \xi$  do
27               $E(\ell, s) \leftarrow E(\ell, s) - \xi$ 
28               $I'(\ell) \leftarrow I'(\ell) + \xi_u$ 
29              if the next slice has the same priority of the current
30                one then
31                break the while loop and advance to the next slice
31  return  $E(\ell, s), \forall(\ell, s) \in \mathcal{L} \times \mathcal{S}'$ 
```
