

1 Team total score

$$P = \sum_{k=1}^{k_c} T_k$$

where

P is a teams' Overall competition score

T is a teams' Total tick score

k is tick number

k_c is current tick number

2 Team total score per tick

$$T = \sum_{s=1}^n T_s$$

where

T is a teams' Total tick score
 T_s is a teams' tick score for one service
 n is number of services
 s is service id

3 Team total score per tick per service

$$T_s = (D_s + S_s) + \sum_{a=1}^t A_{s_a}$$

where

- s* is the service id
- T_s is a teams' Total tick score for one service
- D_s is a teams' Defense tick score for a service
- S_s is a teams' SLA tick score for a service
- a* is team attacked
- t* is total number of teams
- A_{s_a} is a teams' Attack tick score for successful attack on a teams' service

4 Attack score

$$A = b_a + \frac{w_a}{f} + w_r \cdot \begin{cases} 1 & \text{if } r_a \leq r_v \\ 1 - R & \text{if } r_a > r_v \end{cases} \text{ and } f > 0$$

where

A is Attack score

b_a is attack base score

w_a is attack weight

w_r is rank weight

f is number of teams that captured flag from victim teams' service in tick

R is score reduction for attacking down where $0 \leq R \leq 1$

and

$$R = (c_{max} - c_{min}) \cdot \left(\frac{r_v - r_a}{t} \right)^2 + c_{min}$$

where

R is score reduction for attacking down where $0 \leq R \leq 1$

c_{min} is minimum cost for attacking down where $c_{min} \geq 0 \wedge c_{min} < c_{max}$

c_{max} is maximum cost for attacking down where $c_{max} \leq 1$

r_a is rank of attacker in tick flag was lost by victim

r_v is rank of victim in tick flag was lost to attacker

t is total number of teams

5 SLA score

$$S = \begin{cases} b_s + w_a + w_r & \text{if service is up} \\ \frac{b_s + w_a + w_r}{2} & \text{if service is recovering} \\ 0 & \text{if service is down} \end{cases}$$

where

S is SLA score
 b_s is base SLA score
 w_a is attack weight
 w_r is rank weight

and

Service is considered $\begin{cases} \text{up} & \text{if checker returns UP} \\ \text{recovering} & \text{if checker returns RECOVERING} \\ \text{down} & \text{if checker returns anything else} \end{cases}$

6 Defense score

$$D = \begin{cases} b_d + \frac{w_d}{d} & \text{if } S > 0 \text{ and } d > 0 \\ 0 & \text{if } S = 0 \end{cases}$$

where

D is Defense score

b_d is defense base score

w_d is defense weight

d is number of teams that did not loose flags for service in tick

7 Parameters chosen for ECSC 2023

$b_a = 1 \rightarrow$ *attack base score*

$b_d = 2 \rightarrow$ *defense base score*

$b_s = 1 \rightarrow$ *SLA base score*

$w_a = 1 \rightarrow$ *attack weight*

$w_r = 1 \rightarrow$ *rank weight*

$w_d = 1 \rightarrow$ *defense weight*

$c_{min} = 0 \rightarrow$ *minimum cost for attacking down*

$c_{max} = \frac{4}{5} \rightarrow$ *maximum cost for attacking down*

8 ECSC 2023 attack score

$$A = 1 + \frac{1}{f} + 1 \cdot \begin{cases} 1 & \text{if } r_a \leq r_v \\ 1 - R & \text{if } r_a > r_v \end{cases} \text{ and } f > 0$$

where

A is Attack score

f is number of teams that have captured flag from victim teams' service in tick

R is score reduction for attacking down where $0 \leq R \leq 1$

and

$$R = \frac{4}{5} \cdot \left(\frac{r_v - r_a}{t} \right)^2$$

where

R is score reduction for attacking down where $0 \leq R \leq 1$

r_a is rank of attacker in tick flag was lost by victim

r_v is rank of victim in tick flag was lost to attacker

t is total number of teams

9 ECSC 2023 SLA score

$$S = \begin{cases} 3 & \text{if service is up} \\ \frac{3}{2} & \text{if service is recovering} \\ 0 & \text{if service is down} \end{cases}$$

where

S is SLA score

and

$$\text{Service is considered} \begin{cases} \text{up} & \text{if checker returns UP} \\ \text{recovering} & \text{if checker returns RECOVERING} \\ \text{down} & \text{if checker returns anything else} \end{cases}$$

10 ECSC 2023 defense score

$$D = \begin{cases} 2 + \frac{1}{d} & \text{if } S > 0 \text{ and } d > 0 \\ 0 & \text{if } S = 0 \end{cases}$$

where

D is Defense score

d is number of teams that did not loose flags for service in tick