

MFA Project Algorithm (policy)

1. Total points: 100

Location	Device	Weekday	Time
30	40	15	15

Basic policy

Level	Reliability (%)	Validation Information
1	90 - 100	Username + password
2	70 - 89	Username + password + secret question
3	50 - 69	Username + password + email code
4	30 - 49	Username + password + phone code
5	< 30	Username + password + face verification

- 1) Only successfully login connection information will be written in the Database;
- 2) Set up TRUST RATE, that means if the ratio of one item of the login information reaches this TRUST RATE, this login will be as a trust login. For example, if amount of the total login times is 5, and if amount of login using the same laptop is 2, and TRUST RATE = 25%, this login will get 40 (full points) for device item because $2/5 = 40\%$, which is bigger than TRUST RATE.
- 3) Set up EXIST RATE, that means if one item of login information exists, but the ratio is less than TRUST RATE, the login will get (full points * EXIST RATE) points.

2. Location (30)

Zip code	City	Region	Country
5	10	10	5

If request Zip code is in the database,

If the Zip code weight is \geq TRUST_RATE

Return 30;

Else

Return $5 * \text{EXIST_RATE} + 10 + 10 + 5$;

Else if request City is in the database,

If the City weight is \geq TRUST_RATE,

Return $25; // 10 + 10 + 5$

Else

Return $10 * \text{EXIST_RATE} + 10 + 5$;

Else if request Region is in the database,

 If the Region weight is \geq TRUST_RATE,

 Return 15;

 Else

 Return $10 \times \text{EXIST_RATE} + 5$;

Else if request Country is in the database,

 If the Country weight is \geq TRUST_RATE,

 Return 5;

 Else

 Return $5 \times \text{EXIST_RATE}$;

Else

 Return 0;

3. Device (40)

If request MAC address is in the database,

 If the MAC weight is \geq TRUST_RATE,

 Return 40;

 Else

 Return $40 \times \text{EXIST_RATE}$;

Else

 Return 0;

4. Weekday (15) (Mon, Tue, Wed, Thu, Fri, Sat and Sun)

If request Weekday is in the database,

 If the Weekday is \geq TRUST_RATE,

 Return 15;

 Else

 Return $15 \times \text{EXIST_RATE}$;

Else

 Return 0;

5. Time (15) (From 12 am starting, every 3 hours will be as a time frame)

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If request Time is in the database,  
    If the Weekday is >= TRUST_RATE,  
        Return 15;  
    Else  
        Return 15*EXIST_RATE;  
Else  
    Return 0;
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