

Analysis and Verification of Practical Password Strength Meters

Taku Sugai, Akira Kanaoka
(Toho University, Japan)

Introduction

Many sites introduce a password strength meter that measures the safety of a password when setting a password at the time of member registration by using a service on the Web. However, there was a lack of consistent calculation criteria for calculating the strength score by the meter, and it was pointed out that there may be a deviation from the entropy originally owned by the password. Meanwhile, we have not investigated the actual status of password strength meter in the site group which is widely used now. In this poster, we extract sites using password strength meter from Alexa Top 100 site, analyze their behavior, and clarify the actual situation. Furthermore, we analyze statistical information such as distribution of scores actually calculated by the meter using more than 30 million password data sets.

Survey

- Alexa Top 100 Sites
- Picking up sites using password strength meter
- Calculating password score using RockYou dataset

Results

Timing for Composition Policy Confirmation and Score Calculation

	Remote	Local
Composition Policy Confirmation	Twitter, Yandex, eBay, Reddit, Tumblr, Apple	Mail.ru, Rakuten, VK, Yahoo!Japan, NAVER, Google
Score Calculation	Google, eBay, Tumblr, NAVER	Mail.ru, Apple, Rakuten, Reddit, Twitter, VK, Yahoo!Japan, Yandex

Information Used For Score Calculation

Information used	Service
Password Length	Twitter, Yahoo!Japan, VK, Yandex, Reddit, Mail.ru, Apple, Rakuten
Use of the same character	Twitter
Continuous use of character	Yahoo!Japan, Mail.ru, Rakuten, Dropbox
Continuous use of phrases	Yahoo!Japan, Mail.ru
Number of types of characters used	Twitter, VK, Mail.ru, Rakuten
Presence of symbols	Twitter, Yahoo!Japan, Apple
Presence of numbers	Twitter, Yahoo!Japan, Reddit, Mail.ru, Rakuten
Whether capitalization is used	Yahoo!Japan, Reddit, Rakuten
Match with registered words	VK, Rakuten

Average Score and Variance of Each Meter

Service	Score Range	Avg.	Var.	Normalized Avg.	Normalized Var.
Mail.ru	0-3	1.00	0.43	33.07	469.25
Apple	0-4	1.01	0.02	30.40	14.70
Rakuten	0-100	33.84	382.03	33.84	382.03
Reddit	0-100	20.02	166.57	20.02	166.57
Twitter	0-100	27.54	228.72	27.54	228.72
VK	0-4	2.07	0.70	51.84	435.20
Yahoo!Japan	0-4	1.81	0.18	45.25	113.09
Yandex	0-100	38.55	14.69	38.55	14.69
Tumblr	0-5	0.52	0.64	10.44	254.27
NAVER	0-4	1.34	0.97	33.49	603.70
Google	0-4	1.91	1.63	47.81	1015.79

Score Distribution by Each Meter (After Normalization)

