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Evaluation of various ACEs with existing Chinese (BIG5) Domain Names

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Abstract

In order to help the ACE (ASCII Compatible Encoding) Design Team in IDN Working Group to selecting an appropriate ACE proposal. This document offer an overview of the results of various ACEs that being applied to Chinese (BIG5) Domain Names. And give a brief summary of the evaluation result.

1. Test data and tools

The sample data were come from TWNIC registration database. All of them are in BIG5 encoding. The amount of the data is 28454. And the data distribution by the length is:

Length of data	quantity of BIG5 Domain Names
2 chars	3762
3 chars	3914
4 chars	4613
5 chars	1723
6 chars	1851
7 chars	4282
8 chars	1621

9 chars	1254
10 chars	2075
11 chars	1215
12 chars	753
13 chars	646
14 chars	745

amount=28454

TWNIC just accept 2 to 14 BIG5 chars in a Chinese Domain Name. Those data are all in local encoding of BIG5 (or CP950). Base on those data, apply them to various ACEs. There are RACE-03 [RACE], BRACE-00 [BRACE], LACE-01 [LACE], UTF-6-00 [UTF6], DUDE-02 [DUDE], AMC-ACE-M-00 [AMCACEM], AltDUDE-01 [AltDUDE], AMC-ACE-O-00 [AMCACEO], and AMC-ACE-R-01 [AMCACER].

2. Result of each ACE length

The CHN_len is the length of Chinese (BIG5) domain name in byte before apply ACE encoding. All of the data in the same CHN_len, the max_len is the maximum length, the min_len is the minimum length, the aver_len is the averager length of them after apply ACE encoding.

2.1 AMC-ACE-M

CHN_len	max_len	min_len	aver_len
2	8	5	8
3	11	6	11
4	17	8	14
5	17	11	17
6	21	11	20
7	24	13	22
8	27	15	25
9	30	16	28
10	33	18	31
11	36	22	34
12	39	19	37
13	42	21	40
14	45	23	43

2.2 AMC-ACE-O

CHN_len	max_len	min_len	aver_len
2	8	5	8
3	12	6	11
4	20	9	15
5	20	11	18
6	24	11	22

7	27	13	25
8	31	15	29
9	35	16	32
10	39	18	36
11	42	24	38
12	46	19	41
13	50	21	44
14	54	23	48

2.3 AMC-ACE-R

CHN_len	max_len	min_len	aver_len	

2		8	5	8
3		12	6	12
4		20	9	16
5		20	11	19
6		24	11	23
7		28	13	26
8		32	15	30
9		36	16	34
10		40	18	38
11		44	24	41
12		48	19	44
13		52	21	48
14		56	24	51

2.4 AltDUDE

CHN_len	max_len	min_len	aver_len	

2		8	5	8
3		12	6	11
4		20	8	16
5		20	13	19
6		24	11	23
7		28	14	26
8		32	15	30
9		36	18	34
10		40	21	38
11		44	26	41
12		48	26	46
13		52	25	48
14		56	30	53

2.5 BRACE

CHN_len	max_len	min_len	aver_len
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2	7	5	7
3	10	7	10
4	17	8	14
5	17	11	17
6	20	11	20
7	23	13	23
8	28	14	26
9	30	15	30
10	33	17	33
11	36	22	36
12	39	18	39
13	42	20	42
14	46	23	46

2.6 DUDE

CHN_len	max_len	min_len	aver_len	
2		8	5	8
3		12	6	11
4		20	8	16
5		20	13	19
6		24	11	23
7		28	15	26
8		32	15	30
9		36	18	34
10		40	21	38
11		44	27	41
12		48	26	46
13		52	25	48
14		56	30	53

2.7 LACE

CHN_len	max_len	min_len	aver_len	
2		8	7	8
3		12	8	12
4		18	10	15
5		18	18	18
6		21	16	21
7		24	21	24
8		31	23	28
9		31	24	31
10		34	26	34
11		37	34	37
12		40	29	40
13		44	31	44

14	47	36	47
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2.8 RACE

CHN_len	max_len	min_len	aver_len
2		8	5
3		12	7
4		18	8
5		18	18
6		21	20
7		24	24
8		31	28
9		31	31
10		34	34
11		37	37
12		40	40
13		44	44
14		47	47

2.9 UTF-6

CHN_len	max_len	min_len	aver_len
2		8	5
3		12	6
4		20	9
5		20	14
6		24	14
7		28	18
8		32	20
9		36	21
10		40	23
11		44	30
12		48	28
13		52	29
14		56	33

3. Result of each ACE conversion speed

	UTF-6	RACE	LACE	BRACE	DUDE	ALTDUDE
MAX	0.80	0.75	0.82	0.86	0.74	0.70
MIN	0.56	0.55	0.52	0.62	0.53	0.53
AVERAGE	0.68	0.64	0.62	0.73	0.64	0.62

	AMC-ACE-M	AMC-AMC-O	AMC-ACE-R
MAX	1.12	1.92	0.99
MIN	0.86	1.69	0.67
AVERAGE	0.98	1.81	0.82

4. Summary of the result

All the ACE max_length is less than 64, because the Chinese Domain Name is limited from 2 to 14 BIG5 chars. For those sample data, the result of LENGTH and SPEED, it seems the LACE and RACE are better than others.

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