

Email Typosquatting

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Appendices

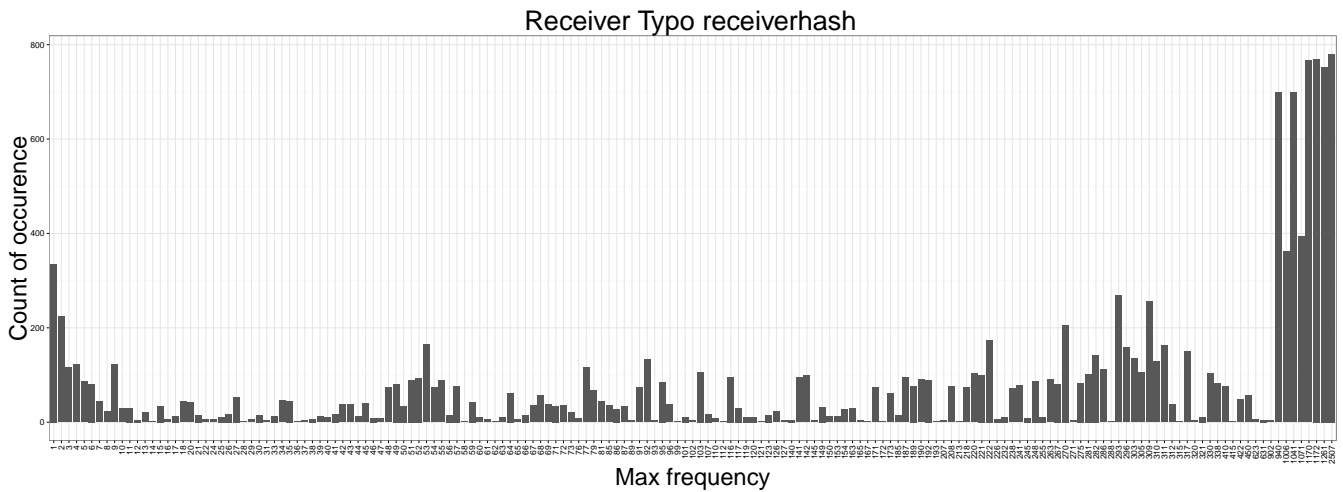


Figure 1: X axis shows the frequency of a receiver hash in our email corpus. Y axis show the number of receiver typo emails which has a receiver hash with that frequency.

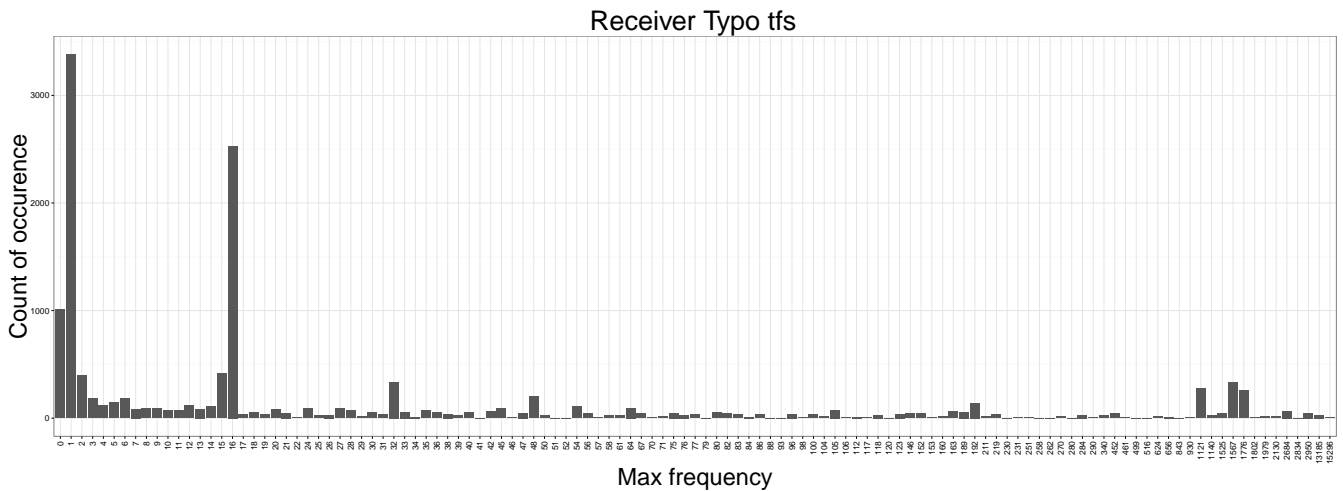


Figure 2: X axis shows the frequency of a bag of word models in our email corpus. Y axis show the number of receiver typo emails which has a receiver hash with that frequency

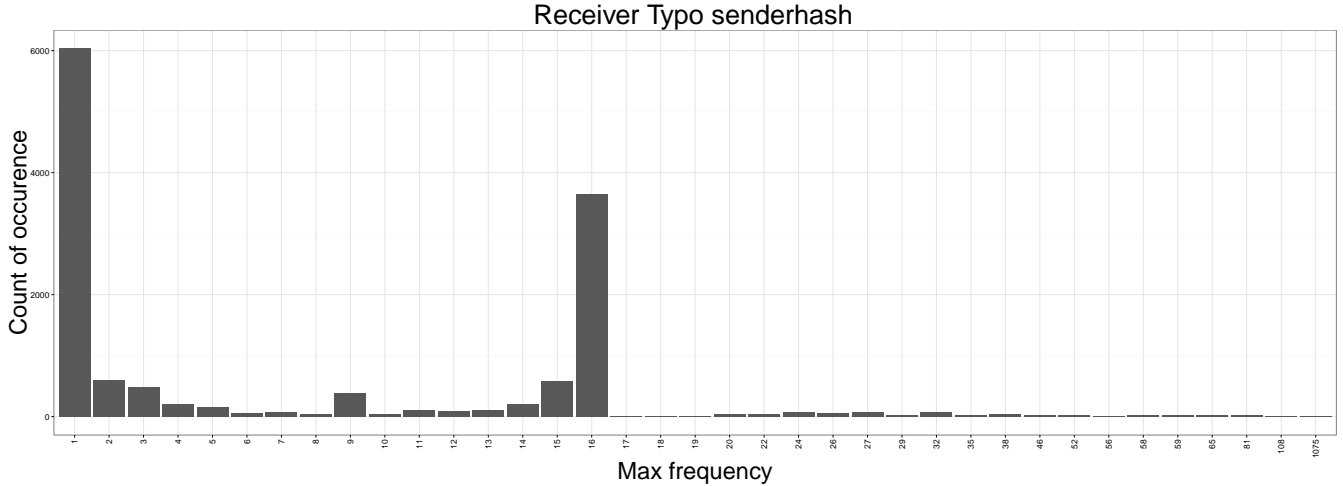


Figure 3: X axis shows the frequency of a sender hash in our email corpus. Y axis show the number of receiver typo emails which has a sender hash with that frequency

Table 1: Overview of our spam filtering system for candidate receiver typo emails

Domain	Typo type	Total emails	Header filtered	Spamassassin	Zip	Collaborative	Auto filtered	Freq filtered	Not filtered	Corrected	isFF
10inutemail.com	receivertypo	1245	292	177	652	62	0	60	0	0	TRUE
comcawst.com	receivertypo	7352	1302	2792	945	1195	395	700	22	4	TRUE
comaast.com	receivertypo	64292	15047	35215	7110	3095	395	3422	7	7	FALSE
comcasu.com	receivertypo	29742	10957	5777	6840	2710	95	3355	7	7	FALSE
comcas5.com	receivertypo	1322	280	567	275	142	15	35	7	7	TRUE
coicast.com	receivertypo	987	0	325	0	45	602	7	7	7	FALSE
comca3t.com	receivertypo	735	220	332	0	92	90	0	0	0	FALSE
gmailq.com	receivertypo	131805	7717	57367	6125	35592	16222	8427	352	352	FALSE
gmail-l.com	receivertypo	2340	2340	0	0	0	0	0	0	0	FALSE
hovmail.com	receivertypo	14856485	4976770	454020	6686530	1915950	12575	808815	1825	1095	FALSE
ho6mail.com	receivertypo	160230	17452	122215	8530	5315	2005	4467	245	147	TRUE
nmailchimp.com	receivertypo	27	0	27	0	0	0	0	0	0	TRUE
ohtlook.com	receivertypo	232667	9192	71395	10720	96780	31197	12062	1320	1320	TRUE
outlook.com	receivertypo	92215	5860	25235	9412	30282	11915	8340	1170	1170	TRUE
outnook.com	receivertypo	114530	8090	73272	7247	12757	4665	7957	540	324	FALSE
oulook.com	receivertypo	40062	5747	20922	5487	3955	1082	2730	137	137	FALSE
oetlook.com	receivertypo	11515	555	8835	470	1057	322	170	105	84	FALSE
ouvlook.com	receivertypo	9497	2240	2720	2575	952	130	855	25	25	FALSE
o7look.com	receivertypo	28370	450	11452	105	7970	4370	4002	20	20	TRUE
ou6look.com	receivertypo	7082	37	2867	32	2892	952	292	7	7	TRUE
sendgri.com	receivertypo	395	20	47	0	92	235	0	0	0	TRUE
verizo0n.com	receivertypo	6502	1757	1777	2077	427	172	280	10	10	TRUE
evrizon.com	receivertypo	7547	2507	1242	2480	742	195	372	7	0	TRUE
verhizon.com	receivertypo	1375	1127	115	87	30	0	10	5	5	FALSE
ve5izon.com	receivertypo	487	97	72	265	25	0	25	2	0	TRUE
vebizon.com	receivertypo	757	50	627	0	7	50	22	0	0	FALSE
vermizon.com	receivertypo	72	0	67	0	5	0	0	0	0	FALSE
vepizon.com	receivertypo	70	0	70	0	0	0	0	0	0	FALSE
yopail.com	receivertypo	406027	101215	150297	41312	53677	29915	28980	630	504	TRUE
zohomil.com	receivertypo	470	0	67	0	177	207	2	15	15	TRUE
zohomial.com	receivertypo	270	2	67	0	192	5	0	2	2	TRUE
Total	receivertypo	16233730	5173187	1060247	6801112	2177550	118172	896200	7260	6041	-

Table 2: Overview of our spam filtering system for candidate receiver typo emails received by SMTP typo domains

Domain	Typo type	Total emails	Header filtered	Spamassassin	Zip	Collaborative	Auto filtered	Freq filtered	Not filtered	isFF
mailgmx.net	receivertypo	1645	422	760	242	77	25	110	7	TRUE
mx1hotmail.com	receivertypo	455	0	257	0	57	45	2	92	TRUE
mx2hotmail.com	receivertypo	2452	692	717	500	170	42	115	215	TRUE
mx3hotmail.com	receivertypo	1692	287	500	250	217	70	127	240	TRUE
mx4hotmail.com	receivertypo	945	105	360	142	47	50	50	190	TRUE
smtpcomcast.net	receivertypo	2465	7	1857	0	525	22	12	40	TRUE
smtppaypal.com	receivertypo	65	0	62	0	0	0	0	2	TRUE
Total	receivertypo	16233730	5173187	1060247	6801112	2177550	118172	896200	7260	-

Table 3: Overview of our spam filtering system for candidate SMTP typo emails

Domain	Typo type	Total emails	Header filtered	Spamassassin	Zip	Collaborative	Auto filtered	Freq filtered	Not filtered	isFF
comcasu.com	smtptypo	1282	97	1172	0	2	2	5	2	FALSE
gmail.com	smtptypo	5744310	5736857	5880	2	450	887	225	7	FALSE
hovmail.com	smtptypo	37303395	37240415	2460	35740	23970	310	440	60	FALSE
outmook.com	smtptypo	6784992	6782992	1967	12	7	0	7	5	FALSE
oulook.com	smtptypo	3097	510	1622	937	10	5	7	5	FALSE
ohtlook.com	smtptypo	4768800	4766150	2152	2	277	87	127	2	TRUE
o7tlook.com	smtptypo	4623945	4621962	1617	0	252	27	82	2	TRUE
sendgri.com	smtptypo	2640	77	1320	1082	22	62	67	7	TRUE
vermzon.com	smtptypo	1425	102	1157	0	50	30	75	10	FALSE
vebizon.com	smtptypo	1667	80	1447	0	25	27	80	7	FALSE
ve5izon.com	smtptypo	1685	80	1475	0	25	27	72	5	TRUE
verizo0n.com	smtptypo	389970	384792	2322	600	315	1860	77	2	TRUE
zohomial.com	smtptypo	11982	72	2737	5995	815	105	2242	15	TRUE
zohomil.com	smtptypo	5177	57	1895	545	1852	362	460	5	TRUE
mailgm.net	smtptypo	3230	142	2687	0	305	2	27	65	TRUE
mxnzohomail.com	smtptypo	955	65	880	0	2	0	5	2	FALSE
outgoingverizon.net	smtptypo	1337	77	970	0	212	0	35	42	TRUE
smtpaol.com	smtptypo	163792	70	162582	0	1057	27	50	5	TRUE
smtpcenturylink.net	smtptypo	3995835	90	1460875	0	2534825	2	27	15	TRUE
smtpcomcast.net	smtptypo	3366790	77	3366147	2	462	20	20	60	TRUE
smtpcoc.net	smtptypo	3542	127	2382	152	835	5	22	17	TRUE
smtpgmx.com	smtptypo	900	40	840	0	0	0	5	15	TRUE
smtplive.com	smtptypo	2437	82	2022	0	20	30	280	2	FALSE
smtprediffmailpro.com	smtptypo	3557	72	2807	5	532	0	120	20	TRUE
smtpverizon.net	smtptypo	4292	80	4162	0	27	2	7	12	TRUE
smtpyandex.com	smtptypo	3942	67	3832	0	7	7	12	15	TRUE
smtpzoho.com	smtptypo	1280	70	1177	0	22	0	5	5	TRUE
Total	smtptypo	102661230	94923222	5114237	45770	2566902	5127	5555	415	-

Table 4: Target domains and their attributes

Domain type	company	Target domain	2014.07.13 Global Alexa R.	2016.09.19 Global Alexa R.	2014.07.13 Company's Email Alexa R.	2016.09.19 Company's Email Alexa R.
banking	Chase	smtp.chase.com	171	122	NA	NA
banking	Paypal	smtp.paypal.com	39	50	NA	NA
email service	10minutemail	10minutemail.com	7917	14552	28	22
email service	Aol	mx.aol.com	121	198	NA	NA
email service	Aol	smtp.aim.com	20623	35653	NA	NA
email service	Aol	smtp.aol.com			NA	NA
email service	GMX	mail.gmx.net	291	316	7	12
email service	GMX	smtp.gmx.com	NA	6430	7	12
email service	GMX	smtp.gmx.net			7	12
email service	Google	gmail.com	145	5023	1	1
email service	Google	imap.gmail.com	145	5023	1	1
email service	Google	imap.gmail.com	145	5023	1	1
email service	Google	smtp.gmail.com			1	1
email service	Hushmail	smtp.hushmail.com	7891	16097	27	25
email service	Mailchimp	mailchimp.com	126	300	4	4
email service	Mailchimp	smtp.mailchimp.com			4	4
email service	Microsoft	hotmail.com	13268	44247	3	3
email service	Microsoft	imap.live.com	12	11	3	3
email service	Microsoft	imap-mail.outlook.com	645	3165	3	3
email service	Microsoft	mx1.hotmail.com			3	3
email service	Microsoft	outlook.com			3	3
email service	Microsoft	smtp.live.com			3	3
email service	Microsoft	smtp-mail.outlook.com			3	3
email service	Myway	smtp.myway.com	6762	126	NA	NA
email service	Rediffmail	smtp.rediffmailpro.com	15812	5983	6	5
email service	Sendgrid	sendgrid.com	3845	9097	17	16
email service	Yahoo	am0.yahoodns.net	NA	NA	2	2
email service	Yandex	smtp.yandex.com	2132	1492	NA	NA
email service	Yopmail	yopmail.com	13696	16063	36	24
email service	Zohomail	mx.zohomail.com	NA	NA	NA	NA
email service	Zohomail	smtp.zoho.com	591	413	NA	NA
email service	Zohomail	zohomail.com			NA	NA
Generic	Apple	mail.icloud.com	1000	341	443	389
Generic	Apple	mail-in2.apple.com	47	389	443	389
Generic	Apple	mail-in4.apple.com	47	389	443	389
ISP	Att	seg.att.com	465	376	NA	NA
ISP	Centurylink	smtp.centurylink.net	5945	4266	NA	NA
ISP	Comcast	comcast.com	846	6048	NA	NA
ISP	Comcast	mx1.comast.com	846	6048	NA	NA
ISP	Comcast	smtp.comcast.net			NA	NA
ISP	Cox	smtp.cox.net	1512	2040	NA	NA
ISP	TWC	email.rr.com	1744	1969	NA	NA
iSP	Verizon	outgoing.verizon.net	3459	14758	NA	NA
ISP	Verizon	smtp.verizon.net			NA	NA
ISP	Verizon	verizon.com			NA	NA

Table 5: Attributes of typosquatting domains registered by us

Domain type	Company	Target domain	Typosquatting domain	Is FatFinger?	IS BitSquatting?	Protocol tested	Place of error	DL typo operation
banking	Chase	smtp.chase.com	smtpchase.com	T	F	smtp	smtp	deletion
banking	Paypal	smtp.paypal.com	smtppaypal.com	T	F	smtp	smtp	deletion
email service	10minutemail	10minutemail.com	10mutemail.com	T	F	any	rcvr,smtp,imap,pop3	deletion
email service	Aol	mx.aol.com	mxnaol.com	F	T	mail	smtp,imap,pop3	substitution
email service	Aol	smtp.aim.com	smtpaaim.com	T	F	smtp	smtp	deletion
email service	Aol	smtp.aol.com	smtpaol.com	T	F	smtp	smtp	deletion
email service	GMX	mail.gmx.net	mailgmx.net	T	F	mail	smtp,imap,pop3	deletion
email service	GMX	smtp.gmx.com	smtpgmx.com	T	F	smtp	smtp	deletion
email service	GMX	smtp.gmx.net	smtpgmx.net	T	F	smtp	smtp	deletion
email service	Google	gmail.com	gmai-l.com	F	F	any	rcvr,smtp,imap,pop3	addition
email service	Google	gmail.com	gmaiql.com	F	F	any	rcvr,smtp,imap,pop3	addition
email service	Google	imap.gmail.com	imaplgmail.com	T	F	imap	imap	substitution
email service	Google	imap.gmail.com	imapngmail.com	F	T	imap	imap	substitution
email service	Google	smtp.gmail.com	smtpngmail.com	F	T	smtp	smtp	substitution
email service	Google	smtp.gmail.com	smtplgmail.com	T	F	smtp	smtp	substitution
email service	Hushmail	smtp.hushmail.com	smtphushmail.com	T	F	smtp	smtp	deletion
email service	Mailchimp	mailchimp.com	nmailchimp.com	T	F	any	rcvr,smtp,imap,pop3	addition
email service	Mailchimp	smtp.mailchimp.com	smtpmailchimp.com	T	F	smtp	smtp	deletion
email service	Microsoft	hotmail.com	hofmail.com	T	F	any	rcvr,smtp,imap,pop3	substitution
email service	Microsoft	hotmail.com	hovmail.com	F	T	any	rcvr,smtp,imap,pop3	substitution
email service	Microsoft	imap.live.com	imapllive.com	T	F	imap	imap	substitution
email service	Microsoft	imap.live.com	imapnlive.com	F	T	imap	imap	substitution
email service	Microsoft	imap-mail.outlook.com	imap-mailoutlook.com	T	F	imap	imap	deletion
email service	Microsoft	mx1.hotmail.com	mx1hotmail.com	T	F	mail	smtp,imap,pop5	deletion
email service	Microsoft	mx1.hotmail.com	mx1nhotmail.com	F	T	mail	smtp,imap,pop6	substitution
email service	Microsoft	mx2.hotmail.com	mx2hotmail.com	T	F	mail	smtp,imap,pop7	deletion
email service	Microsoft	mx2.hotmail.com	mx2nhotmail.com	F	T	mail	smtp,imap,pop8	substitution
email service	Microsoft	mx3.hotmail.com	mx3hotmail.com	T	F	mail	smtp,imap,pop9	deletion
email service	Microsoft	mx3.hotmail.com	mx3nhotmail.com	F	T	mail	smtp,imap,pop10	substitution
email service	Microsoft	mx4.hotmail.com	mx4hotmail.com	T	F	mail	smtp,imap,pop11	deletion
email service	Microsoft	mx4.hotmail.com	mx4nhotmail.com	F	T	mail	smtp,imap,pop12	substitution
email service	Microsoft	outlook.com	o7tlook.com	T	F	any	rcvr,smtp,imap,pop3	substitution
email service	Microsoft	outlook.com	oetlook.com	F	T	any	rcvr,smtp,imap,pop3	substitution
email service	Microsoft	outlook.com	ohtlook.com	T	F	any	rcvr,smtp,imap,pop3	substitution
email service	Microsoft	outlook.com	out6look.com	T	F	any	rcvr,smtp,imap,pop3	substitution
email service	Microsoft	outlook.com	outlo0k.com	T	F	any	rcvr,smtp,imap,pop3	substitution
email service	Microsoft	outlook.com	outnook.com	F	T	any	rcvr,smtp,imap,pop3	substitution
email service	Microsoft	outlook.com	oulook.com	F	T	any	rcvr,smtp,imap,pop3	substitution
email service	Microsoft	outlook.com	ouvlook.com	F	T	any	rcvr,smtp,imap,pop3	substitution
email service	Microsoft	smtp.live.com	smtpllive.com	T	F	smtp	smtp	substitution
email service	Microsoft	smtp.live.com	smtplnive.com	F	T	smtp	smtp	substitution
email service	Microsoft	smtp-mail.outlook.com	smtp-mailoutlook.com	T	F	smtp	smtp	deletion
email service	Myway	smtp.myway.com	smtpmway.com	T	F	smtp	smtp	deletion
email service	Rediffmail	smtp.rediffmailpro.com	smtprediffmailpro.com	T	F	smtp	smtp	deletion
email service	Sendgrid	sendgrid.com	sendgri.com	T	F	any	rcvr,smtp,imap,pop3	deletion
email service	Yahoo	am0.yahoodns.net	am0nyahoodns.net	F	T	mail	smtp,imap,pop3	substitution
email service	Yandex	smtp.yandex.com	smtpyandex.com	T	F	smtp	smtp	deletion
email service	Yopmail	yopmail.com	yopail.com	T	F	any	rcvr,smtp,imap,pop3	deletion
email service	Zohomail	mx.zohomail.com	mxnzohomail.com	F	T	mail	smtp,imap,pop3	substitution
email service	Zohomail	smtp.zoho.com	smtpzoho.com	T	F	smtp	smtp	deletion
email service	Zohomail	zohomail.com	zohomial.com	T	F	any	rcvr,smtp,imap,pop3	transposition
email service	Zohomail	zohomail.com	zohomil.com	T	F	any	rcvr,smtp,imap,pop3	deletion
Generic	Apple	mail.icloud.com	mailnicloud.com	F	T	mail	smtp,imap,pop3	substitution
Generic	Apple	mail-in2.apple.com	mail-in2napple.com	F	T	mail	smtp,imap,pop3	substitution
Generic	Apple	mail-in4.apple.com	mail-in4apple.com	T	F	mail	smtp,imap,pop3	deletion
ISP	Att	seg.att.com	segnatt.com	F	T	mail	smtp,imap,pop12	substitution
ISP	Centurylink	smtp.centurylink.net	smtpcenturylink.net	T	F	smtp	smtp	deletion
ISP	Comcast	comcast.com	coicast.com	F	T	any	rcvr,smtp,imap,pop3	substitution
ISP	Comcast	comcast.com	comaast.com	F	T	any	rcvr,smtp,imap,pop3	substitution
ISP	Comcast	comcast.com	comea3t.com	F	T	any	rcvr,smtp,imap,pop3	substitution
ISP	Comcast	comcast.com	comcas5.com	T	F	any	rcvr,smtp,imap,pop3	substitution
ISP	Comcast	comcast.com	comcast.com	F	T	any	rcvr,smtp,imap,pop3	substitution
ISP	Comcast	comcast.com	comcawst.com	T	F	any	rcvr,smtp,imap,pop3	addition
ISP	Comcast	mx1.comcast.com	mx1ncomcast.com	F	T	mail	smtp,imap,pop4	substitution
ISP	Comcast	smtp.comcast.net	smtpcomcast.net	T	F	smtp	smtp	deletion
ISP	Cox	smtp.cox.net	smtpcox.net	T	F	smtp	smtp	deletion
ISP	TWC	email.rr.com	emailnr.com	F	T	mail	smtp,imap,pop3	substitution
iSP	Verizon	outgoing.verizon.net	outgoingverizon.net	T	F	smtp	smtp	deletion
ISP	Verizon	smtp.verizon.net	smtpvverizon.net	T	F	smtp	smtp	deletion
ISP	Verizon	verizon.com	evrizon.com	T	F	any	rcvr,smtp,imap,pop3	transposition
ISP	Verizon	verizon.com	ve5izon.com	T	F	any	rcvr,smtp,imap,pop3	substitution
ISP	Verizon	verizon.com	vebizon.com	F	T	any	rcvr,smtp,imap,pop3	substitution
ISP	Verizon	verizon.com	vepizon.com	F	T	any	rcvr,smtp,imap,pop3	substitution
ISP	Verizon	verizon.com	verhizon.com	F	T	any	rcvr,smtp,imap,pop3	substitution
ISP	Verizon	verizon.com	verizo0n.com	T	F	any	rcvr,smtp,imap,pop3	addition
ISP	Verizon	verizon.com	vermzon.com	F	T	any	rcvr,smtp,imap,pop3	substitution

Table 6: Registrants owning a large number of typosquatting domain names

Number of Typosquatted Domains	Unknown	SMTP support		Names	Organizations
		Supported	Not Supported		
156383	154533	1898	42	domain admin;domain admin / this domain is for sale	ingredomains.com
33333	33305	19	9	this domain for sale worldwide;this domain for sale worldwide 339-222-5132;this domain for sale toll free 866-822-9073 or 339-222-5132;n webrg	raesnaes, inc.;raesnames;buydomains.com;this domain for sale worldwide 339 222 5132
30865	30855	10	0	whois foundation;domain may be for sale, check afternic.com domain admin;domain admin;domain may be for sale, check afternic domain admin	whois foundation;megatrustfast sass
15449	15434	15	0	dns administrator	cykon technology limited
12206	13	12192	1	domain manager	eweb development inc.
9784	9783	1	0	domain administrator	domainsmarket.com
8810	8398	134	278	wujianfeng;wu jianfeng;zhengjie zhang;shanghai rongbaoshiyoutianxiangongsi	wujianfeng;jianfeng;www.jimmi.com;wu jianfeng
7273	2775	4498	0	noorinet	noorinet
5561	5538	21	2	guojianguang;guo jian guang	guojianguang;guo jian guang
5295	87	5207	1	higi bian film;higi bian	los angeles new;losangelesnews.com inc.;losangelesnews.com;los angelesnews.com
4735	2344	1868	523	reactivation period	
4068	3957	105	6	new ventures services, corp	new ventures services, corp
3725	1765	1957	3	jiangyilin;zhu jiangyilin jiangjiang yinlin	chenghuyisuo;xinlei;jiangyilin;www.yisuo.com;chengdu
3469	3195	252	22	new ventures;new ventures services	new ventures;new ventures services;hostmaster.com
2673	968	1704	1	domain administrator	dvlpmst marketing, inc.
2589	2507	66	16	wu wen bin;wuxun bin	xia men yin si bao lu fu wu you xian gong si;wu wen bin
2545	1210	1262	73	protection of private person	
2441	886	798	757	domain id shield service	domain id shield service co., limited
2420	2144	220	56	linshi moban;zhengguo linke yanglinshimoban linshimoban	nijingsuzhu zhi binzeng zhi yueward
2140	2037	7	96	lirong shishi lirong	lirong shishi lirong;shilirong
2081	2080	0	1	wenchao chen;song qinxiang;songqinxiang songqinxiang;chen wenchao	song qinxiang;chen wenchao
2012	2011	1	0	gregg ostrick	gno, inc.
1994	1559	345	0	gary willcott	the web group (client account)
1903	44	1859	0	domain hostmaster	protopixel pty. ltd.;protopixel pty ltd
1901	842	794	265	beth schmierer;namecheap.com for sale;namecheap.com namecheap.com;namecheap.com	vt sistemas de informatica ltda;namecheap;namecheap, inc;refrunit
1817	0	1817	0	gabrielly santos rodrigues	changepal.s.l.
1812	1765	46	1	kenji hirawa	gno digirock, inc.
1808	1807	1	0	admin	admin
1779	1779	0	0	ryusung	ryusung
1757	180	1561	26	xserver inc. xserver;wpz xserver inc.;naoki kobayashi;xserver xserver inc.	bet inc.;xserver, inc. - sixcore;xserver inc.;bet,inc.
1704	628	1076	0	netsupport askmysite	askmysite.com llc
1624	64	13	1547	domain administrator	china capital
1546	25	1521	0	lei shixiaohu lu;shilei	www.jimmi.com;shilei
1469	1466	2	0	netcorp;netcorp;netcorp, llc	netcorp;netcorp, llc;inquire about this domain via contact email address
1404	672	597	135	domain admin	privatetehis biz
1401	1142	259	0	yang kyung won	yang kyung won
1387	1386	1	0	kim seokjun	kim seokjun
1349	1275	32	42	weisheng lu;xiaohu huzhibao youyuling liu	you miliao;www.jimmi.com;zheng taocheng xinning
1328	1322	6	0	william com;william william;roam, william	germanium inc.;speednames.com;hostmaster
1315	1065	152	98	wuxi yilian llc	wuxi yilian llc

Table 7: Name servers with a high proportion of typosquatting domains.

Name Server	Total Domains	Ratio		Count		SMTP Support			DigiMedia.com, L.P.
		Ctypo	Ttypo	Ctypo	Ttypo	Unknown	Yes	No	
gbcnd.net	1082	0.89	0.17	968	182	968	0	0	Robert Brooks
storeland.ru	5919	0.76	0.18	4476	1038	4438	38	0	Privacy protected
citizenhawk.net	6424	0.66	0.67	4220	4320	4220	0	0	Brand protection: CitizenHawk, Inc.
a0f.net	37715	0.61	0.6	22884	22691	22882	2	0	Brand protection: CitizenHawk, Inc.
orbitz.com	1528	0.54	0.52	820	792	818	2	0	Orbitz Worldwide, LLC
shutterfly.com	680	0.51	0.19	350	130	12	338	0	Shutterfly, Inc.
easily.net	77730	0.41	0.34	31588	26116	31448	140	0	Privacy protected
frays.com	1568	0.41	0.19	642	304	136	506	0	Privacy protected
liverealdeals.com	29708	0.39	0.48	11628	14174	22	11604	2	Privacy protected
lifesatest.com	912	0.37	0.34	336	308	0	336	0	Doug Powell
dnsiz.com	12698	0.35	0.37	4434	4664	4434	0	0	jianghong
consumerinfo.com	4853	0.35	0.31	1694	1510	1692	2	0	Consumerinfo.com, Inc.
dnparking.com	15810	0.32	0.32	5047	5085	5047	0	0	Privacy protected
dnssafe.com	3639	0.3	0.26	1101	954	0	1101	0	Privacy protected
redmondcd.com	23870	0.28	0.23	6734	5442	6734	0	0	Privacy protected
slickdns.com	1105	0.28	0.01	308	7	288	20	0	John Barham
domainingdepot.com	51460	0.27	0.27	14022	13956	1168	12854	0	Privacy protected
domainca.com	17514	0.27	0.18	4643	3233	4490	151	2	Marble Internet Inc.
gettyimages.com	2936	0.27	0.24	783	693	306	477	0	Getty Images (US), Inc.
mfk1.com	7414	0.26	0.21	1910	1554	1910	0	0	Privacy protected
securedoffers.com	2640	0.26	0.22	692	590	690	2	0	Privacy protected
e43n83hd.com	2554	0.26	0	668	0	124	0	544	Privacy protected
torresdns.com	26340	0.25	0.24	6570	6416	6566	4	0	Privacy protected
domainmx.com	14884	0.25	0.22	3786	3262	3786	0	0	Privacy protected
koolwebsites.com	4344	0.25	0.26	1086	1122	0	1086	0	Ibrahim Kazanci
smtmdns.com	48062	0.24	0.24	11420	11670	11416	4	0	Privacy protected
ename.cn	1413	0.24	0.09	343	130	343	0	0	Xiamen Yi Ming Technology Co., Ltd
createsend.com	672	0.24	0.09	160	59	60	100	0	Campaign Monitor Pty Ltd
domainmanager.com	19026	0.23	0.16	4424	2990	380	4044	0	Privacy protected
digimedia.com	5834	0.23	0.21	1333	1210	1318	15	0	DigiMedia.com, L.P.

Table 8: Distribution of mail software and language based on email headers after and before spam filtering.

Mail Software	All email		Mail Software	Receiver typo emails		Language	All email		Language	Receiver typo emails	
	Count	Perc.		Count	Perc.		Count	Perc.		Count	Perc.
Total not unknown	5707255	100	Total not unknown	920	100	Total not unknown	1168693	100	Total not unknown	427	100
microsoft outlook express 6.00.2600.0000	1925943	33.75	iphone mail (13d20)	158	17.17	en-us	567648	48.57	en-us	158	37.00
microsoft office outlook 12.0	279577	4.90	microsoft outlook 15.0	47	5.11	en-gb	312177	26.71	pt-br	29	6.79
microsoft outlook 14.0	256069	4.49	microsoft cdo for windows 2000	23	2.50	ar-jo	131052	11.21	es-es	26	6.09
phpmailer 5.2.2	253220	4.44	microsoft outlook 14.0	22	2.39	en-in	119439	10.22	fr-fr	25	5.85
ipad mail (12h143)	230748	4.04	apple mail (2.3124)	21	2.28	en	34282	2.93	es-mx	24	5.62
apple mail (2.2104)	228885	4.01	phpmailer 5.2.9	20	2.17	en-us	787	0.07	es-co	14	3.28
iphone mail (12h143)	228603	4.01	microsoft office outlook 12.0	16	1.74	es-mx	396	0.03	en	12	2.81
infrared polaris mobile mailer v2.5	224206	3.93	zendesk mailer	15	1.63	de-de	333	0.03	de-de	11	2.58
iphone mail (13b143)	192914	3.38	iphone mail (13f69)	15	1.63	de-at	319	0.03	en-gb	10	2.34
cleancode.email v3.1.3	170518	2.99	xerox mailer /4.03	13	1.41	es-es	244	0.02	nl-nl	9	2.11
print manager v1.10.258.19079	159873	2.80	phpmailer 5.2.14	11	1.20	es-pe	236	0.02	es-pe	8	1.87
activefax 4.20	121203	2.12	microsoft outlook 16.0	10	1.09	fr-fr	200	0.02	es-ar	6	1.41
microsoft outlook 16.0	119765	2.10	phpmailer 5.1	9	0.98	pt-br	167	0.01	ar-sa	6	1.41
mutt/1.5.21 (2010-09-15)	76296	1.34	jas std	8	0.87	it-it	146	0.01	fr	6	1.41
ibm notes release 9.0.1 october 14, 2013	75220	1.32	iphone mail (13g36)	8	0.87	pl-pl	94	0.01	en-au	6	1.41
apple mail (2.1283)	73480	1.29	ipad mail (13f69)	8	0.87	ru-ru	77	0.01	fr-ca	5	1.17
microsoft outlook 15.0	64665	1.13	mozilla/5.0 (windows nt 6.1; wow64; rv:11.0)	7	0.76	de	75	0.01	es-ec	5	1.17
microsoft-macoutlook/14.0.0.100825	61235	1.07	phpmailer 5.2.10	7	0.76	fr	66	0.01	nl-be	5	1.17
mutt/1.5.4i	56407	0.99	mozilla/5.0 (windows nt 6.1; rv:11.0)	7	0.76	nb-no	61	0.01	es	4	0.94
zuckmail [version 1.00]	50217	0.88	microsoft outlook express 6.00.2900.5931	7	0.76	da-dk	55	0.00	he	4	0.94