When Shoestrings Snap

The perils of hosting web apps on a tight budget

Rory Shillington

Why I love infosec

- Volts and Bits Ltd
- Web App design
- Website maintenance
- IT Support
- IoT
- CTF

By day

Designing, testing and breaking solar inverters

Qualified electrical engineer

I am an expert in this part of the web app

My introduction to non-profit organisations

- As a university student
- Local chapter of a prestigious worldwide organisation
- Non-profit, community service oriented organisation
- Run by volunteers in their spare time
- Very little money - mostly from fundraisers
- What's missing from this list?

What did the organisation do?

- Organise volunteers for other community organisations
- Plant trees
- Mentor students at local schools
- Provide university scholarships
- Funding conference travel
- Leadership training
- Social events

What did the organisation NOT do?

- Backups
- Salt passwords
- Patch servers
- Document IT systems
- Configure firewalls

Why not?

- No glory or visibility in IT tasks
- Limited money to outsource
- Not considered core business
- Boring / lack of interest
- Lack of expertise
- Previous IT Officer had graduated and left town

Here's where I come in...

- After sticking my neck out while assisting with community events
- I joined the committee
- Was nominated as new IT officer / "most technical person in the room"
- Unanimously voted in with much relief

Inherited a dedicated server

- Internet facing IPv4 address
- No firewall
- MTA with mail forwarders
- Several mailing lists
- Behind on patches
- No auth rate limiting. Anywhere.
- Root access!

Inherited a dedicated server

- Public IPv4 address
- No firewall
- MTA with mail forwarders
- Several mailing lists
- Behind on patches
- No auth rate limiting. Anywhere.
- Root access!

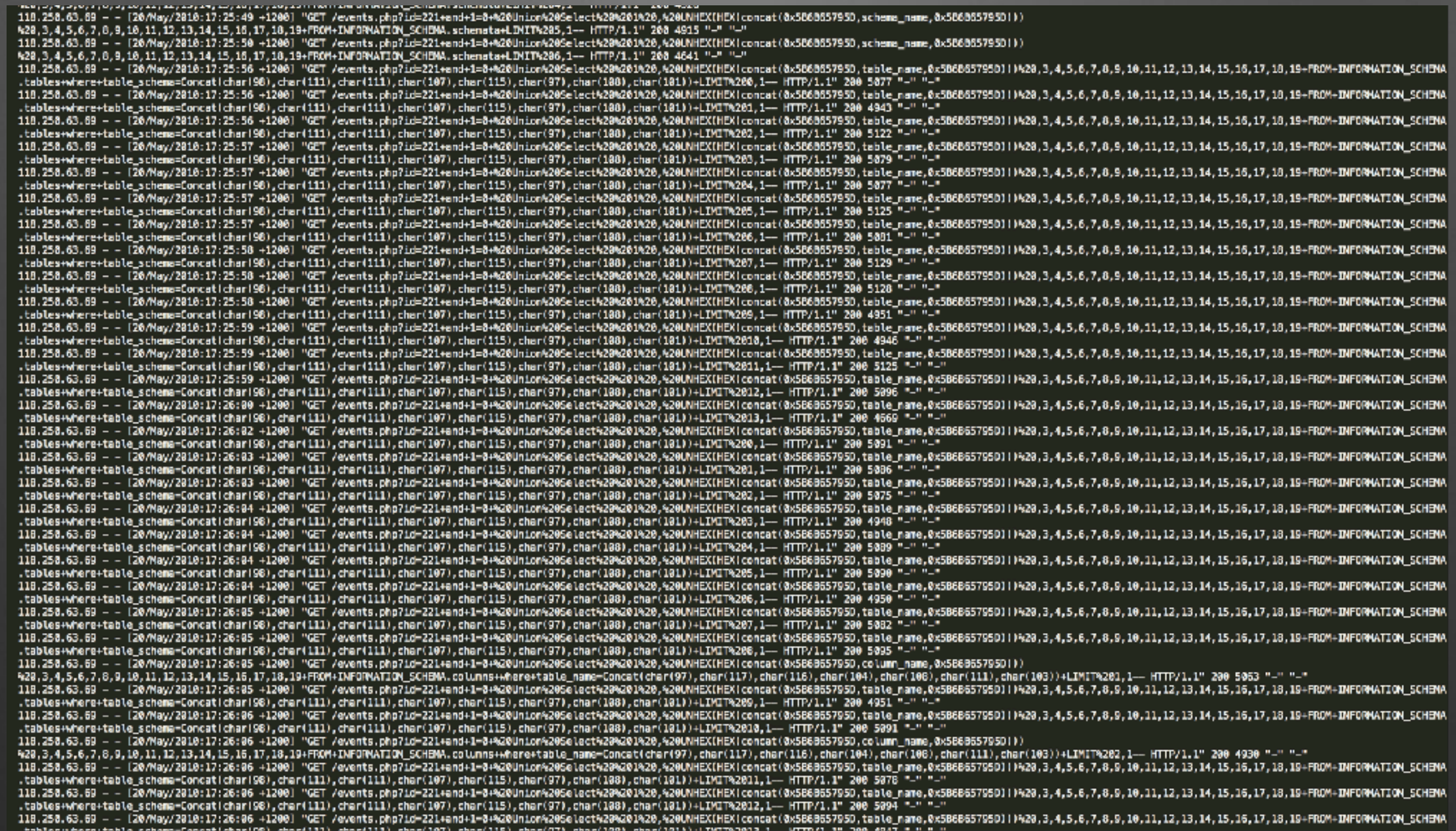
The Custom Web App

- Handles personal information of the committee
- Internet accessible
- Login system stores unsalted MD5 hashes of passwords
- Coded in a language I'd never used before
- What could possibly go wrong?

Photo credit: Ian Baker

Where did this come from?

Review the logs!



Review the logs!

118.250.63.69 - - [20/May/2010:17:25:56 +1200] "GET /events.php?id=221+and+1=0+%20Union%20Select%20%201%20,%20UNHEX(HEX(concat(0x5B6B65795D,table_name,0x5B6B65795D)))%20,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19+FROM+INFORMATION_SCHEMA.tables+where+table_schema=Concat(char(98),char(111),char(111),char(107),char(115),char(97),char(108),char(101))+LIMIT%200,1--HTTP/1.1" 200 5077 "-" "-"

Disaster Recovery: What I did

- Inspected advert code
- Searched database for other instances
- Removed advert code
- Reviewed access logs
- Tested samples of SQL injection query strings
- Code inspection & correction
- Reported details to committee

Long term mitigations

- Switched to a well supported library for salted, strongly hashed passwords; changed all passwords
- Removed disused scripts
- Implemented better user input sanitization
- Refactored all database transaction code with prepared statements
- Shifted to virtualised server on enterprise equipment
- Outsourced mail functions

Small business

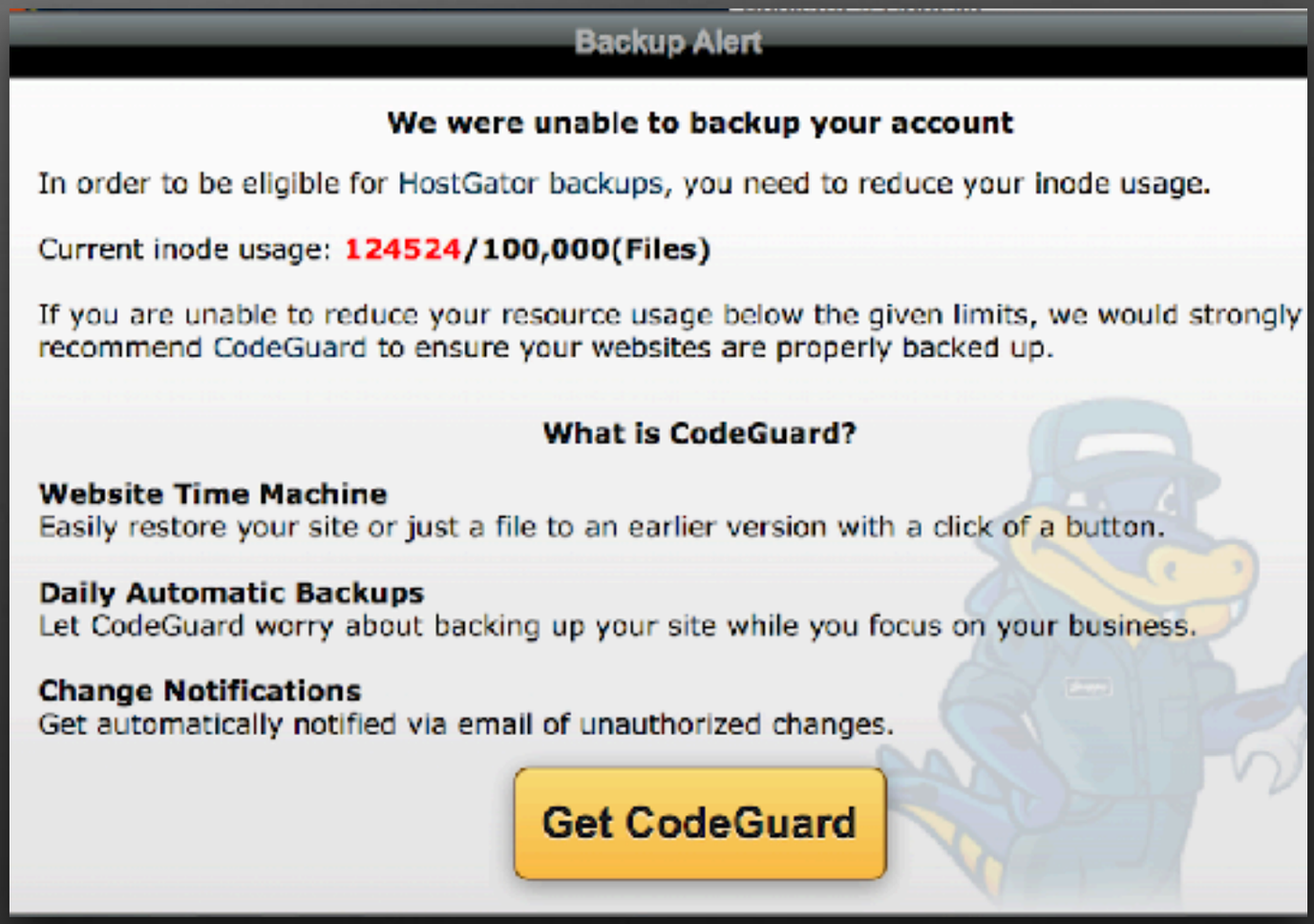
- Similar issues to non-profit organisations
- No IT department
- Often using very low cost infrastructure
- Lack understanding / interest in technical issues
- IT is often an afterthought, left to one person
- Can be a big a target as they have money

Cue horror story #2

- New client (family friend)
- Client not receiving replies from hosting provider
- Provider's only known contact is a hotmail address
- Can I please help?
- Umm.....

The hosting provider

- Email me their password
- Has 30 websites on a $6/month unlimited domain shared hosting package
- All are running outdated copies of a very popular blogging software
- Backups are broken



What went wrong?

- Client had basic technical knowledge but lacked experience required to assess quality of supply chain
- Client was not aware of the risks faced
- Hosting provider did little to mitigate or inform

How could we mitigate?

- Outsource technical functions to capable hands
- Generally that means cloud / managed services when you are under resourced
- Education - understanding that not all services are created equal, cheap is cheap for a reason
- Find a trusted advisor who actually knows their stuff - thats probably you!!

Case study: email forwarding

- Let's say you register your domain and have some basic hosting attached
- Already well established using webmail and hey, they give you 100x the storage of your cheap hosting
- The obvious thing to do is forward all email from domain alias to webmail
- CPanel makes this really really easy!

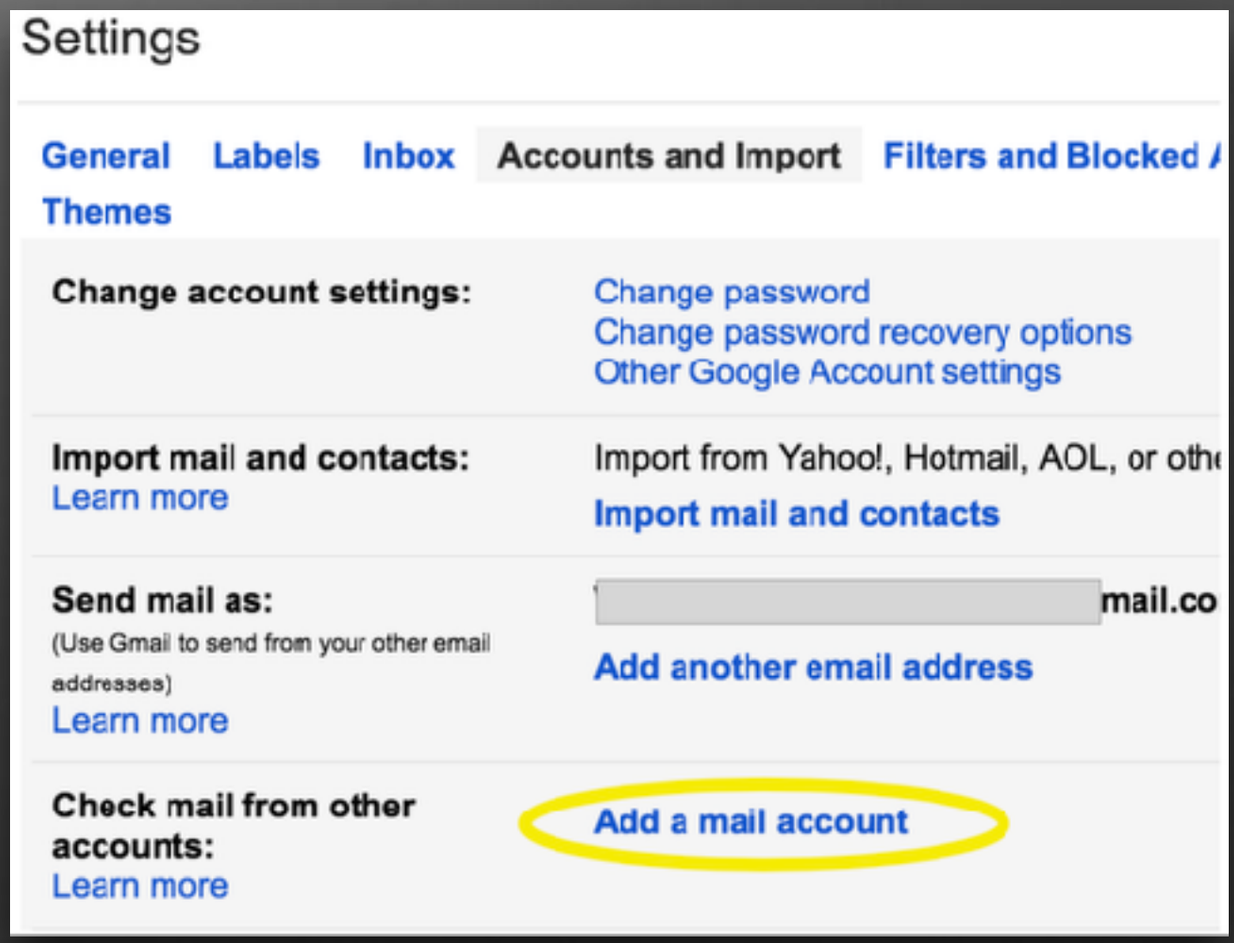
Bad idea

- All emails are forwarded including junk
- Forwarders may execute upstream of spam filters
- Forwarders may not set forwarding headers correctly
- Some webmail providers will then think your server is the source and blacklist your IP
- Particularly bad if you share an IP with others - the risk goes both ways

Image credit: Wikimedia Commons

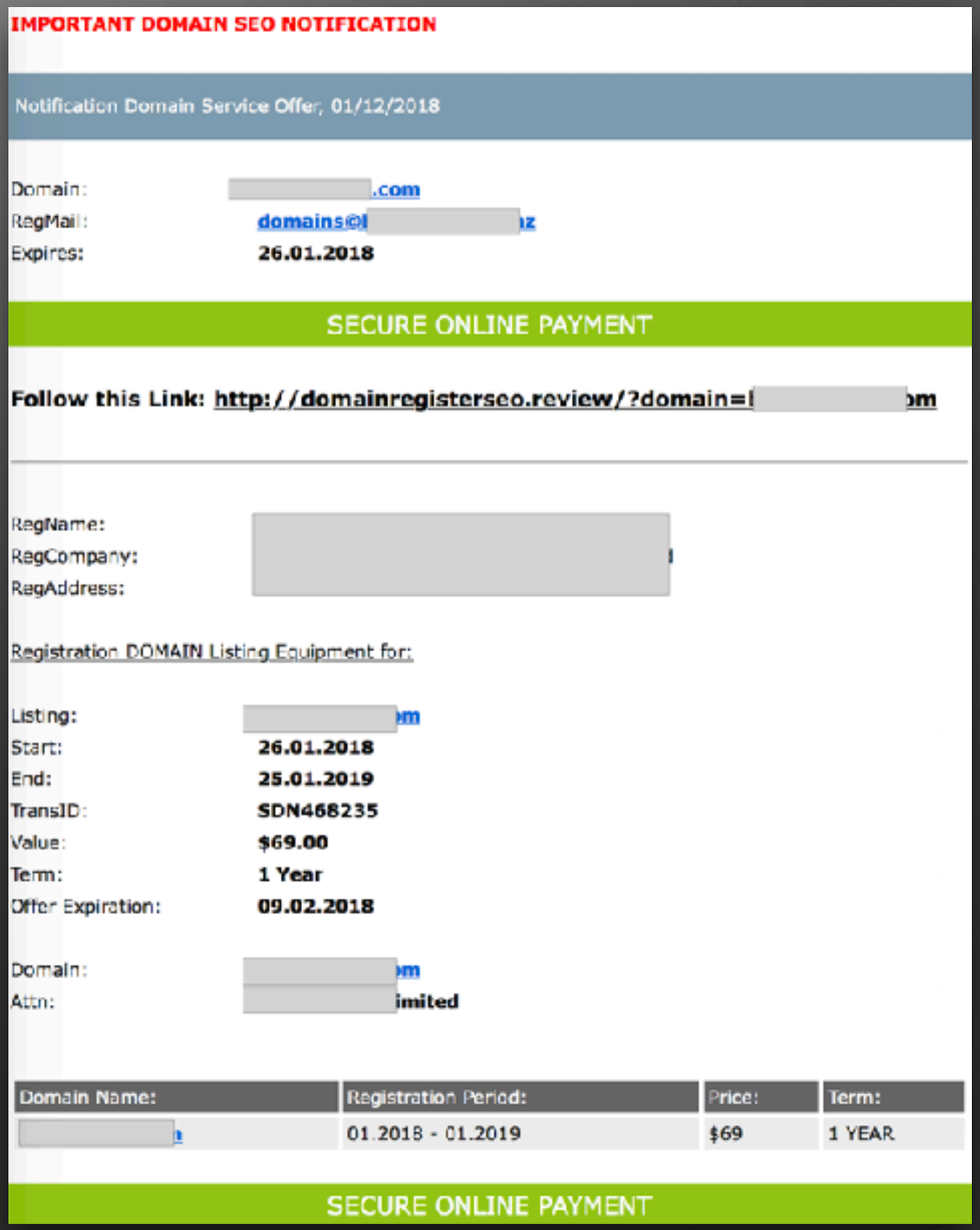
A Better Approach

- Create mail accounts with hosting provider
- Configure webmail provider to download emails via POP3
- All major providers support this arrangement
- Alternatively, register your domain via webmail provider



Talking of spam...

- Looks like a domain is about to expire
- Actually unsolicited SEO services
- Busy people might not pay close attention
- Non-technical people may not understand
- Email contains personal info from whois to look legitimate



IMPORTANT DOMAIN SEO NOTIFICATION

Notification Domain Service Offer, 01/12/2018

Domain: .com
RegMail: domains@
Expires: 26.01.2018

SECURE ONLINE PAYMENT

Follow this Link: http://domainregisterseo.review/?domain=

RegName:
RegCompany:
RegAddress:

Registration DOMAIN Listing Equipment for:

Listing:
Start: 26.01.2018
End: 25.01.2019
TransID: SDN468235
Value: $69.00
Term: 1 Year
Offer Expiration: 09.02.2018

Domain:
Attn:

Domain Name:	Registration Period:	Price:	Term:
	01.2018 - 01.2019	$69	1 YEAR

SECURE ONLINE PAYMENT

Conclusion

- Non-profit organisations and small businesses face substantial challenges with their IT systems
- Basics such as email and website hosting can be major headaches
- Non-technical people can be particularly vulnerable to malicious actors as well as ineptitude of providers
- We as technical individuals can and indeed should help where possible - go volunteer!

Questions?

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