The Future of Hacking

An Ethical Hacker's View

Peter Wood

Chief of Operations

First•Base Technologies

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What is a hacker?

- Someone who plays golf poorly
- A programmer who breaks into computer systems in order to steal or change or destroy information
- A programmer for whom computing is its own reward; may enjoy the challenge of breaking into other computers but does no harm
- One who works hard at boring tasks

[WordWeb.info]

Is that all?

What is hacking?

- Hacking is a way of thinking

  A hacker is someone who thinks outside the box. It's someone who discards conventional wisdom, and does something else instead. It's someone who looks at the edge and wonders what's beyond. It's someone who sees a set of rules and wonders what happens if you don't follow them. [Bruce Schneier]

- Hacking applies to all aspects of life and not just computers
- Increasingly, hacking is used to perpetrate crimes – theft, blackmail, terrorism …

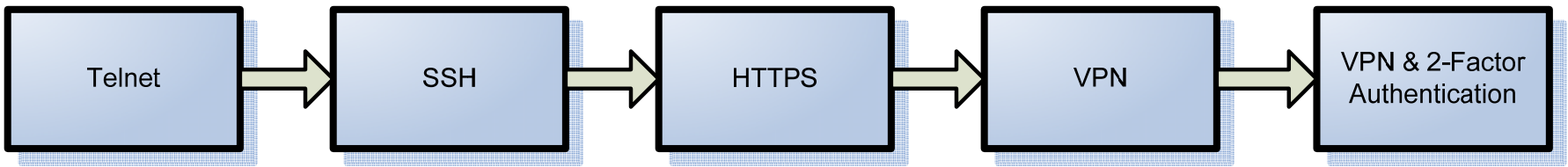
Criminal hacking techniques

- Internet intrusion attacks
  (against web applications, remote access portals)
- Trojans, rootkits, keyloggers et al.
  (via phishing, cross-site scripting, web sites)
- Botnets and denial of service attacks
  (primarily for blackmail or political attacks)
- Social engineering & physical attacks
  (insider attacks, wireless, bluetooth, laptop theft)

Typical response: technology

For web application attacks

For remote access attacks



This becomes an arms race - criminals will seek an easier route …

The blended attack

Social engineering *plus* technology

+

Currently:

- Phishing
- Trojans & rootkits
- Laptop theft
- In person intrusion

Why social engineering?

- Social engineering can be used to gain access to any system, irrespective of the platform.
- It’s the hardest form of attack to defend against because hardware and software alone can’t stop it.

Social engineering

- Any medium that provides one-to-one communications between people can be exploited, including face-to-face, telephone and electronic mail. All it takes is to be a good liar.

  - Dorothy E. Denning
    Information Warfare and Security

Remote worker hack

1. Buy a pay-as-you-go mobile phone
2. Call the target firm's switchboard and ask for IT staff names and phone numbers
3. Overcome their security question: *Are you a recruiter?*
4. Call each number until voicemail tells you they are out
5. Call the help desk claiming to be working from home
6. Say you have forgotten your password and need it reset now, as you are going to pick up your kids from school
7. Receive the username and password as a text to your mobile
8. Game over!

IT support hack

1. Get staff contact names and numbers from reception
2. Call a target user who is unlikely to be technical
3. Say you are from IT working on upgrading their servers over the weekend
4. Say you need their username and password to test their account so that all will work smoothly on Monday morning
5. Game over!

In Person

- Be an employee, visitor or maintenance staff
- Look for information lying on desks and overhear conversations
- Do some shoulder surfing
- Plug in a sniffer or keylogger
- Simply use a vacant desk & workstation

Would **you** let this man into **your** building?

Key Logger

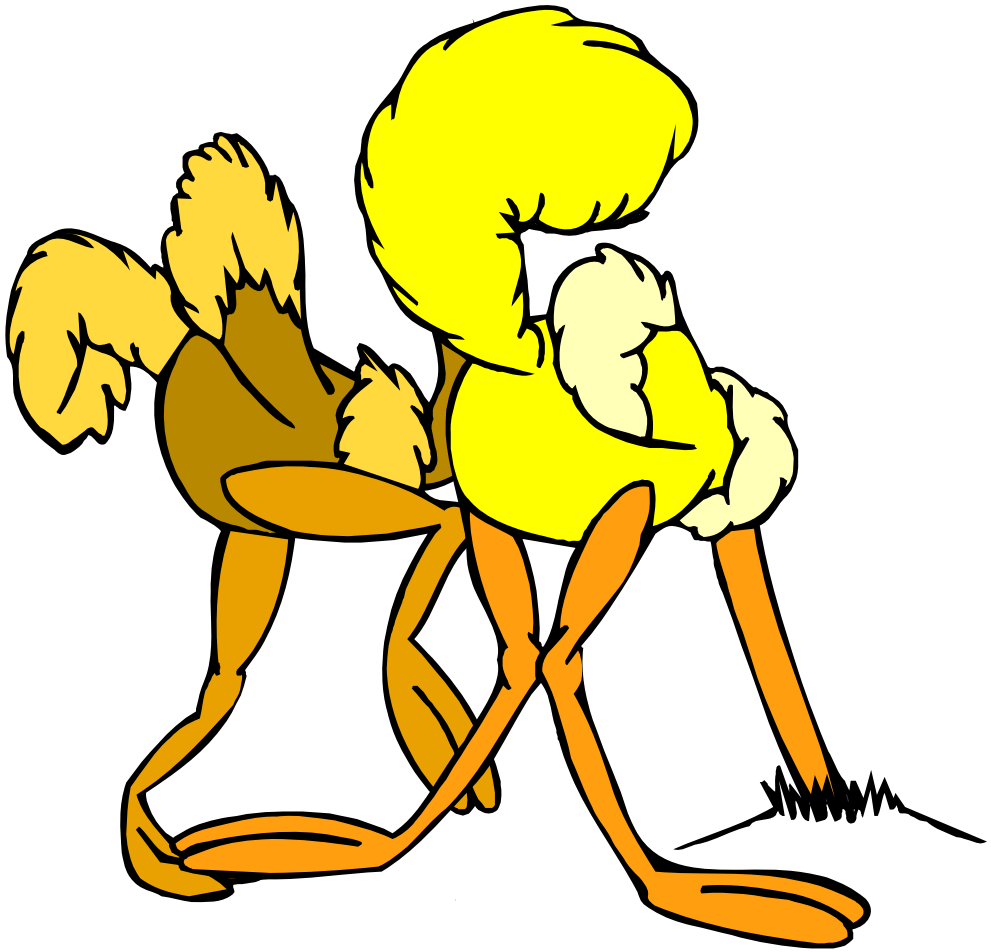
Time to get admin password = 10 minutes

Keystroke capture

Keystrokes recorded so far is 2706 out of 107250 ...

<PWR><CAD>fsmith<tab><tab>arabella
xxxxxxx <tab><tab> None<tab><tab> None<tab><tab> None<tab><tab>
<CAD> arabella
<CAD>
<CAD> arabella
<CAD>
<CAD> arabella
exit
tracert 192.168.137.240
telnet 192.168.137.240
cisco

A typical response



Preventing blended attacks

All the money spent on software patches, security hardware, and audits could be wasted without prevention of social engineering attacks

That means investing in staff awareness backed up by policies

Countermeasures

Physical aspect:

- in the workplace
- over the phone
- dumpster diving
- on-line

Psychological aspect:

- persuasion
- impersonation
- conformity
- friendliness

Combat strategies require action on **both** the physical and psychological levels

Staff Awareness

- Train all employees - everyone has a role in protecting the organisation and thereby their own jobs
- If someone tries to threaten them or confuse them, it should raise a red flag
- Train new employees as they start
- Give extra security training to security guards, help desk staff, receptionists, telephone operators
- Keep the training up to date and relevant

Workplace Security Policy

- Shred phone lists, email lists and other important documents before throwing away
- Some documents will need to be locked away
- Basic best practice - clear desk policy

End Point Security Policy

- Use screen savers with password controls
- Encrypt information on desktops, laptops and PDAs
- Secure mobiles and PDAs (infrared, bluetooth)
- Secure wireless (strong encryption, short range)
- Physically destroy unused hard disks, CDs and other media

Help Desk Policy

- Password resets only with call-back and PIN authentication
- Incident reporting and response procedures
- Clear escalation procedures
- Help desk staff should be encouraged to withhold support when a call does not feel right. In other words “just say no …..”

Staff Guidance

- What can be discussed over the telephone
- What can be discussed outside the building
- What can be written in an e-mail
- Don’t use e-mail notification or voicemails when away from the office. It sets up the replacement as a target.
- How to report an incident and to whom

Compliance

- Have a security assessment test performed and heed the recommendations
  - Test the company's ability to protect its environment, its ability to detect the attack and its ability to react and repel the attack
  - Have the first test performed when the company is expecting it
  - Do a blind test the second time around

End of Part One

Need more information?

Peter Wood

Chief of Operations

First•Base Technologies

peterw@firstbase.co.uk

http://fbtechies.co.uk
http://white-hats.co.uk
http://peterwood.com

The Real Risks of Stolen Laptops

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This Presentation

- All organisations now have laptop users
- Laptops are vulnerable to theft
- This info may help reduce your exposure!

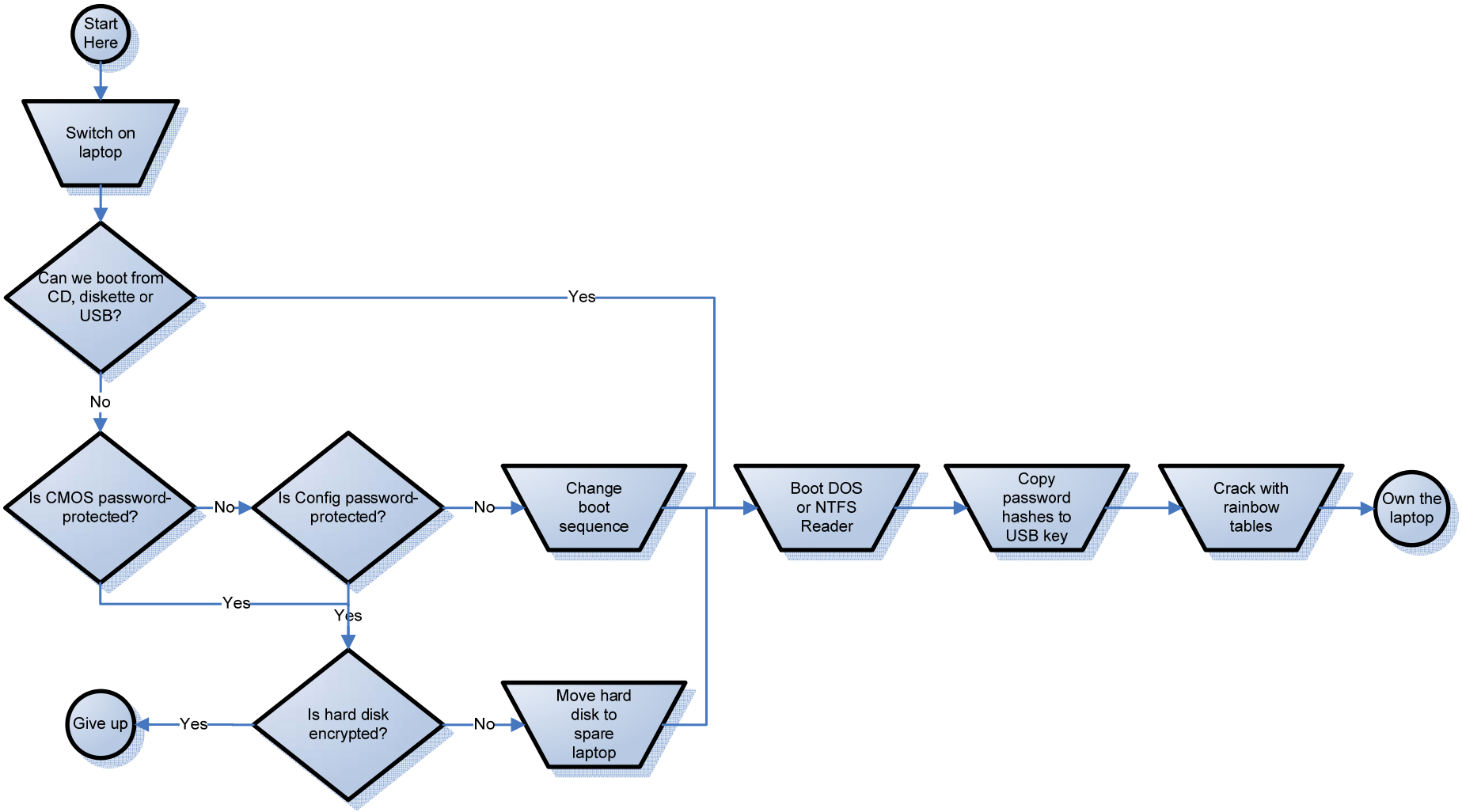
The target - a “corporate” laptop

- What sensitive information can we steal?
- What credentials can we steal?
- Can we connect to the corporate network?
- Can we introduce a Trojan?

Some example objectives

- Company-confidential documents & spreadsheets
- User's logon
- The local admin logon
- User's personal data
- User's VPN logon
- The contents of the corporate network!

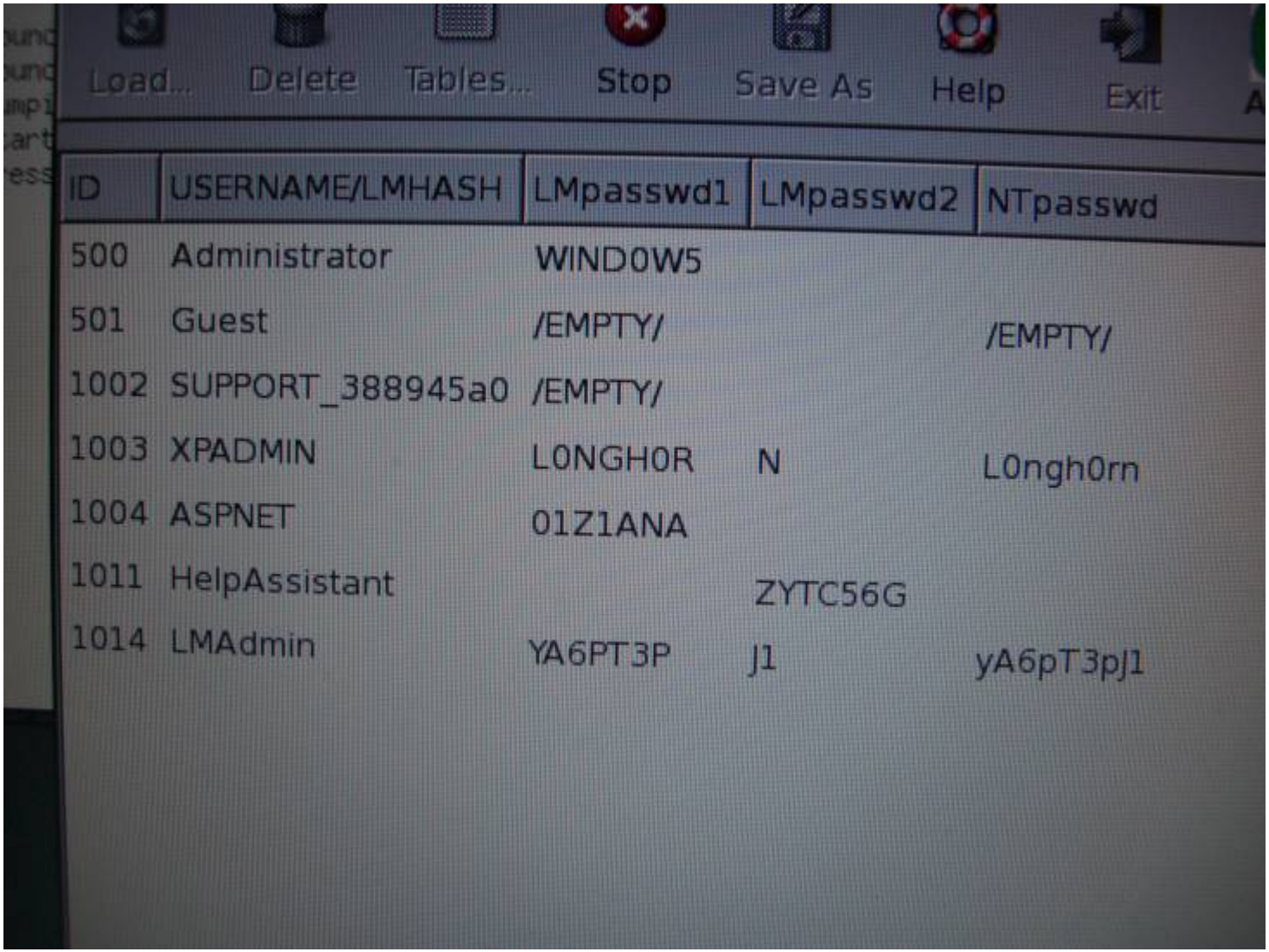
Stage 1 – Own the laptop



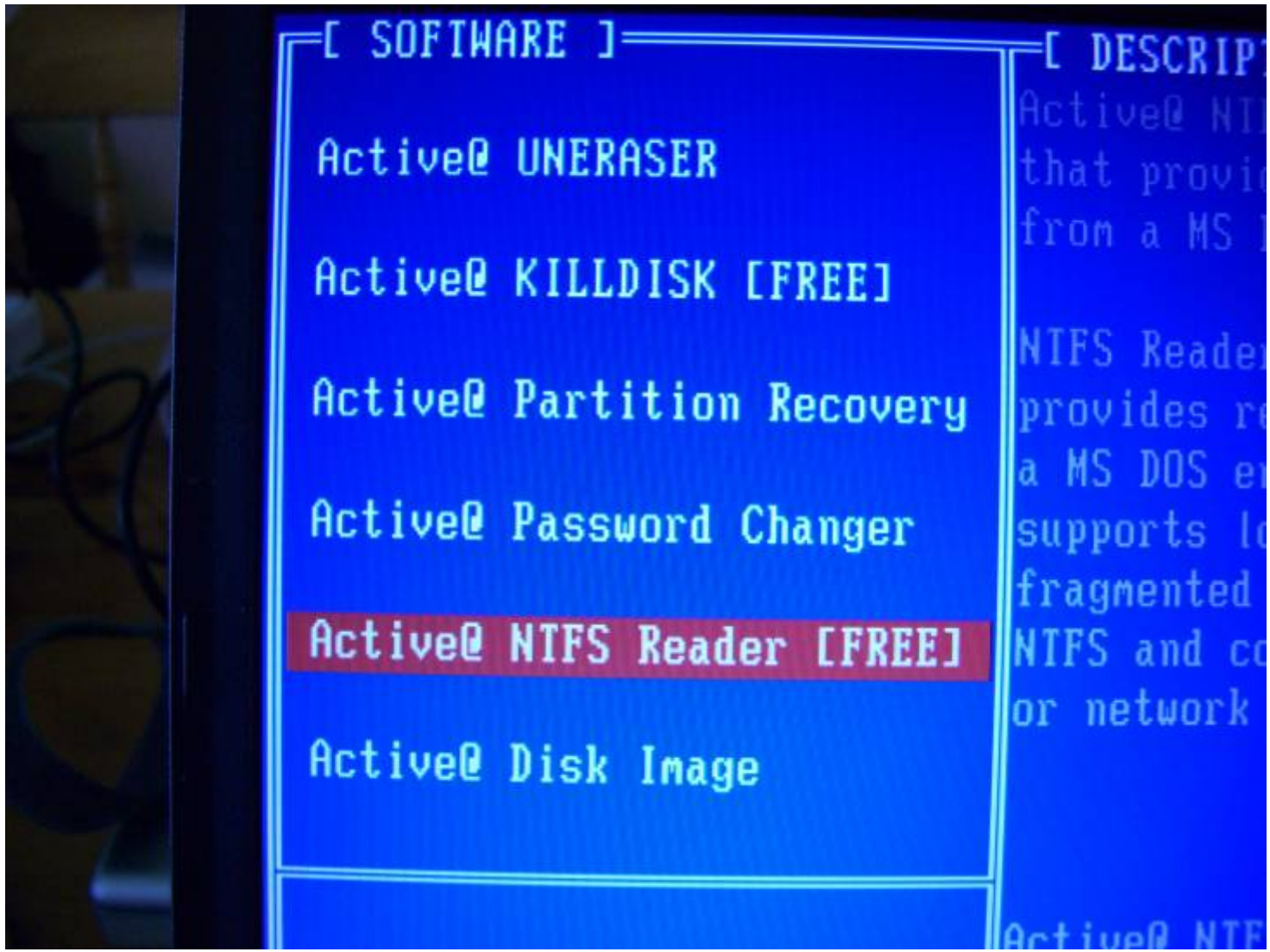
If we can boot from CD …

Boot Ophcrack Live

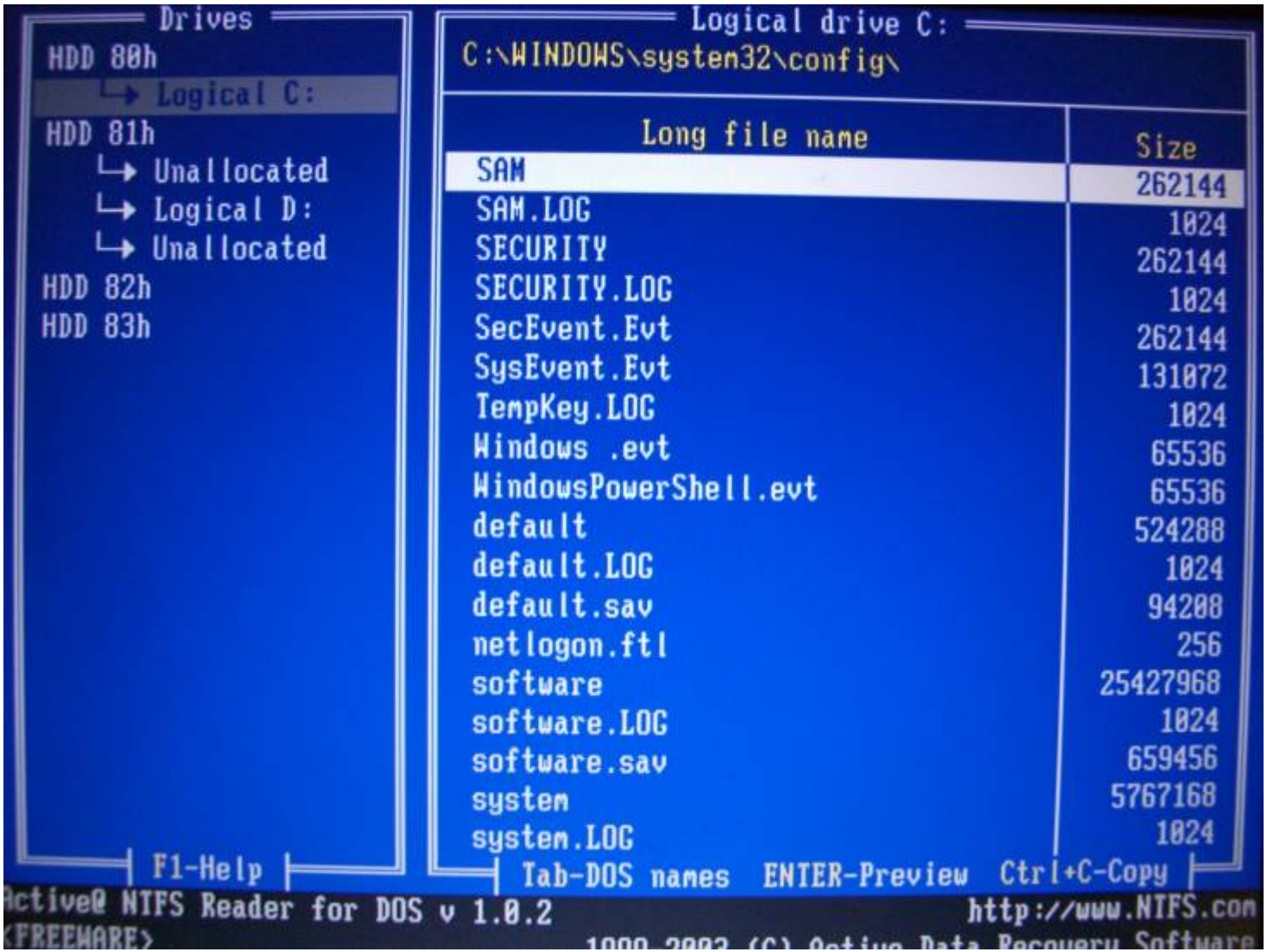
We have the passwords!



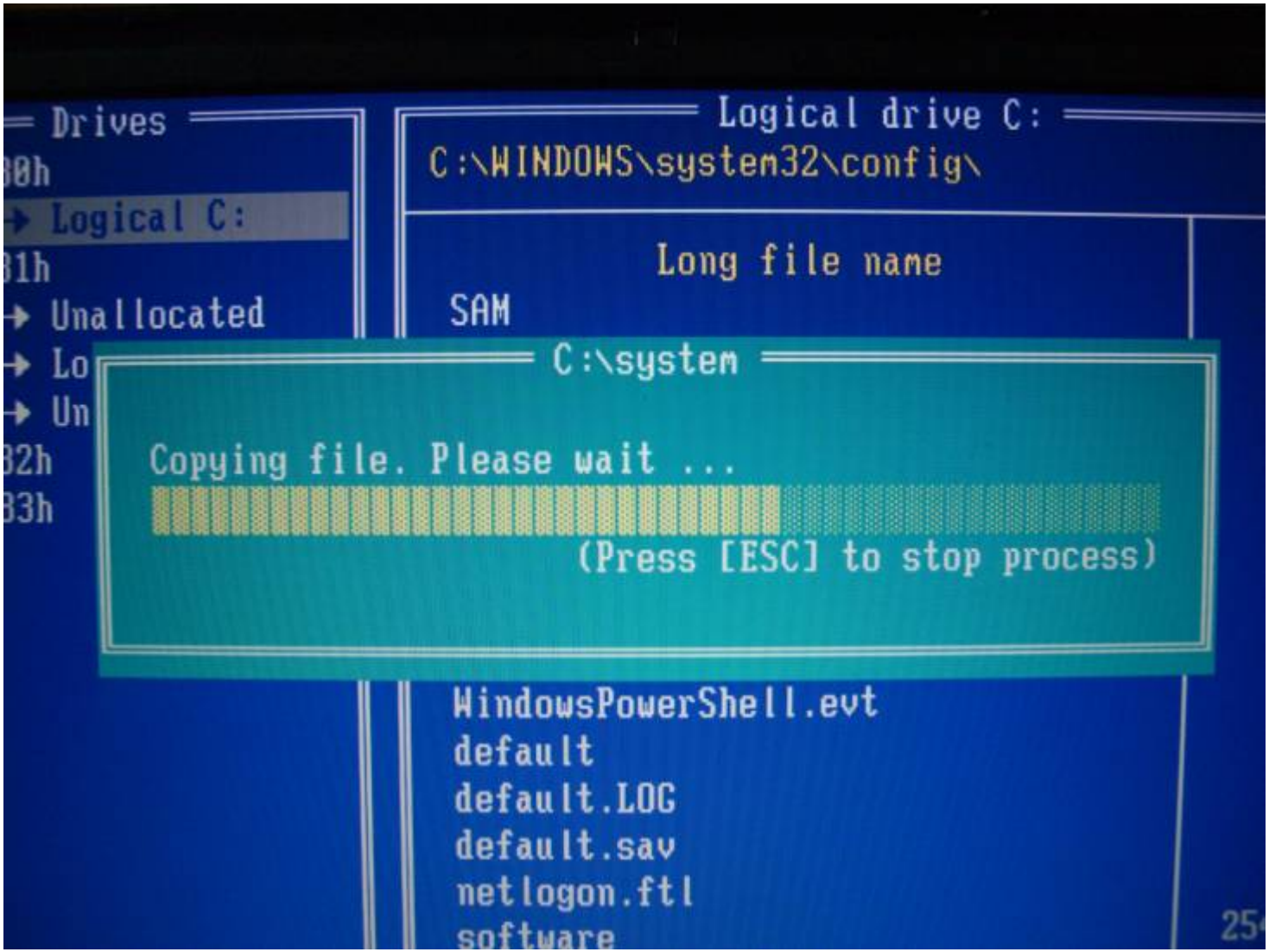
… or just read the disk



Find the password hashes

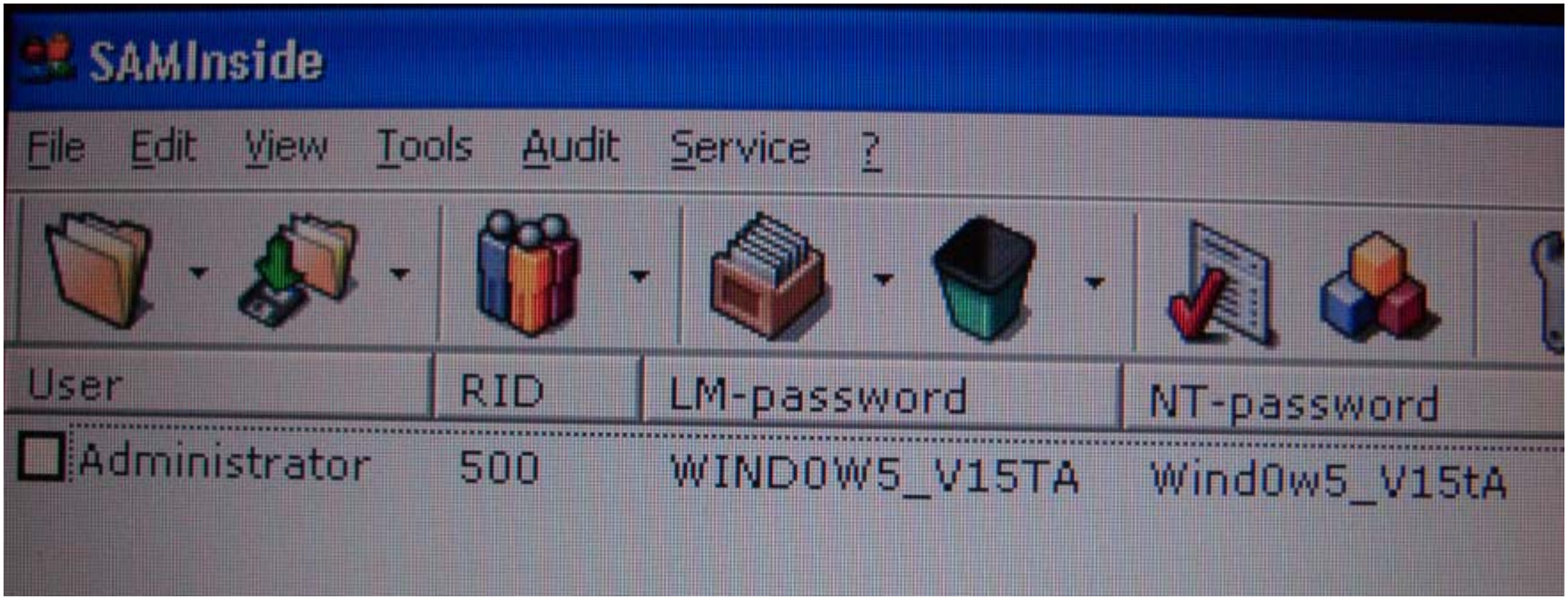


Copy hashes to USB key

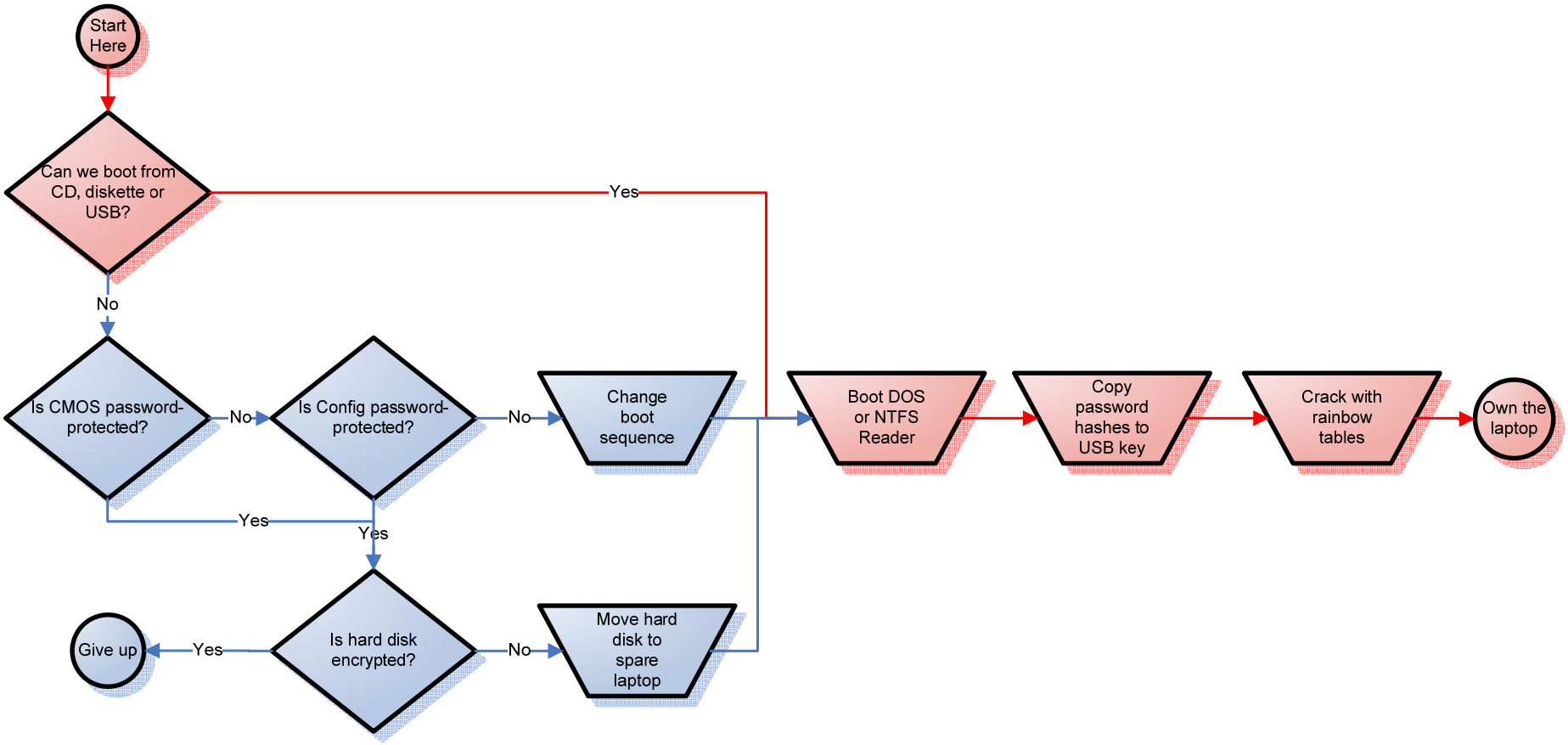


Copy hashes to your cracking PC and plug in the rainbow tables

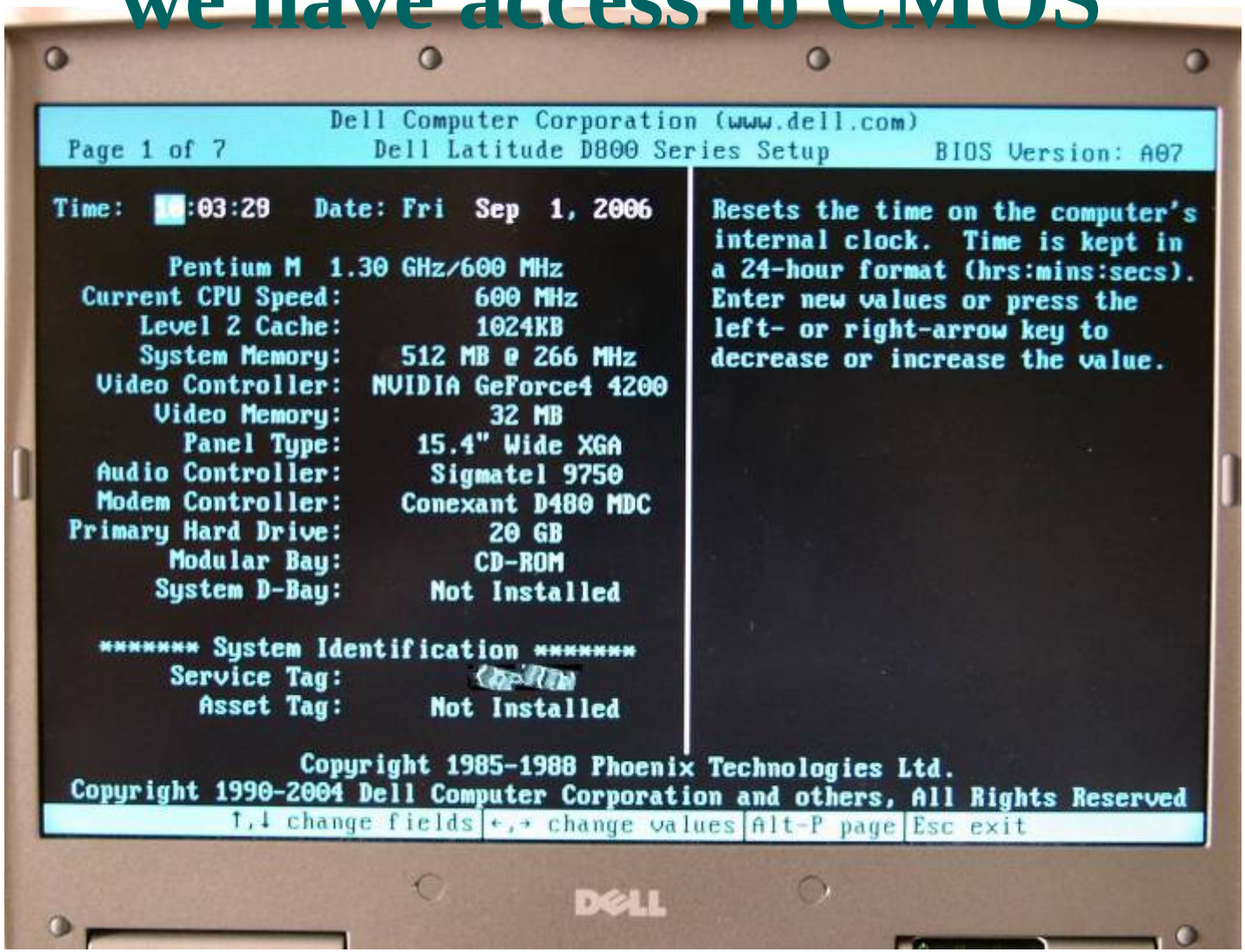
… a few minutes later



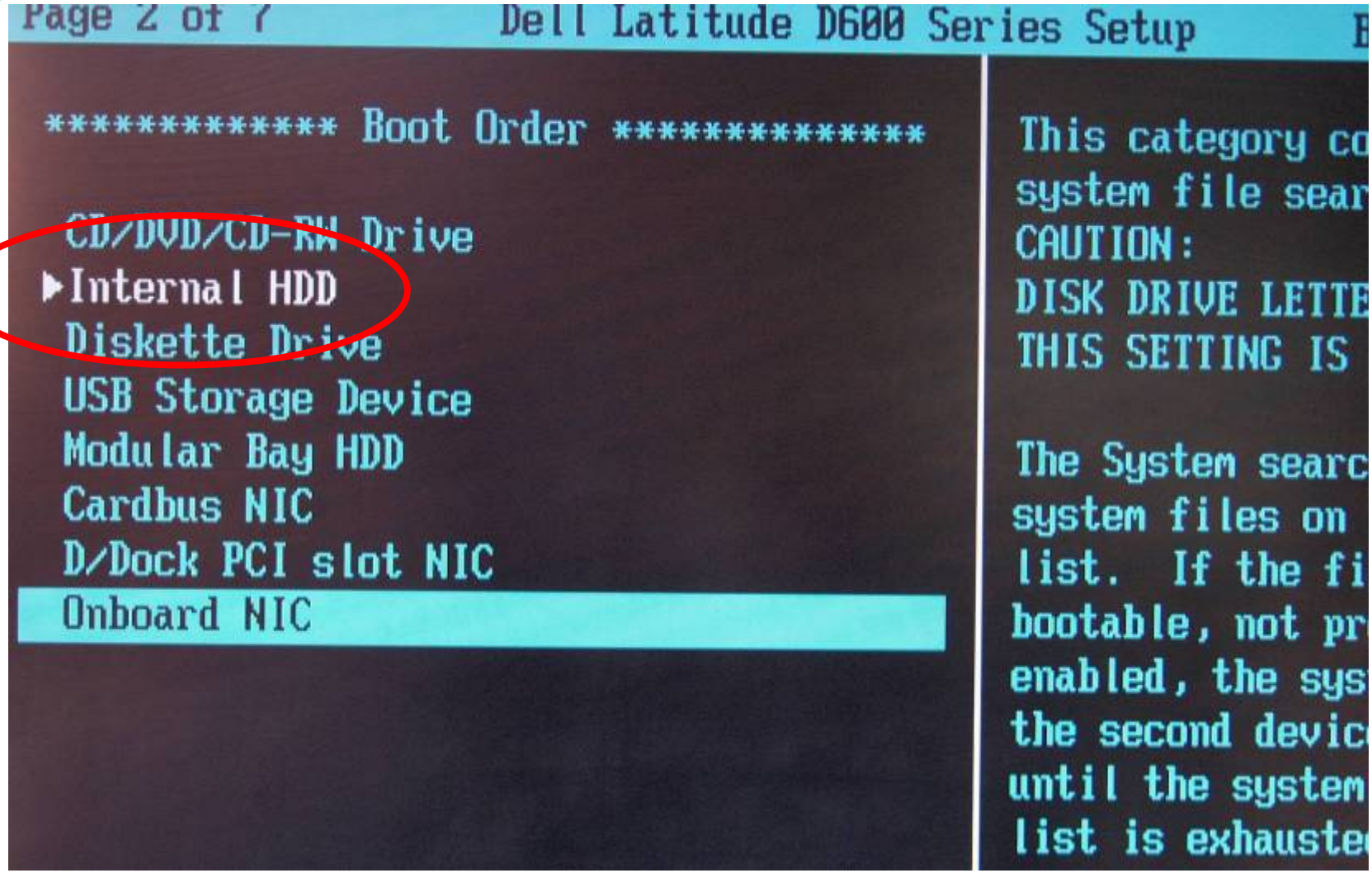
That was the shortest route



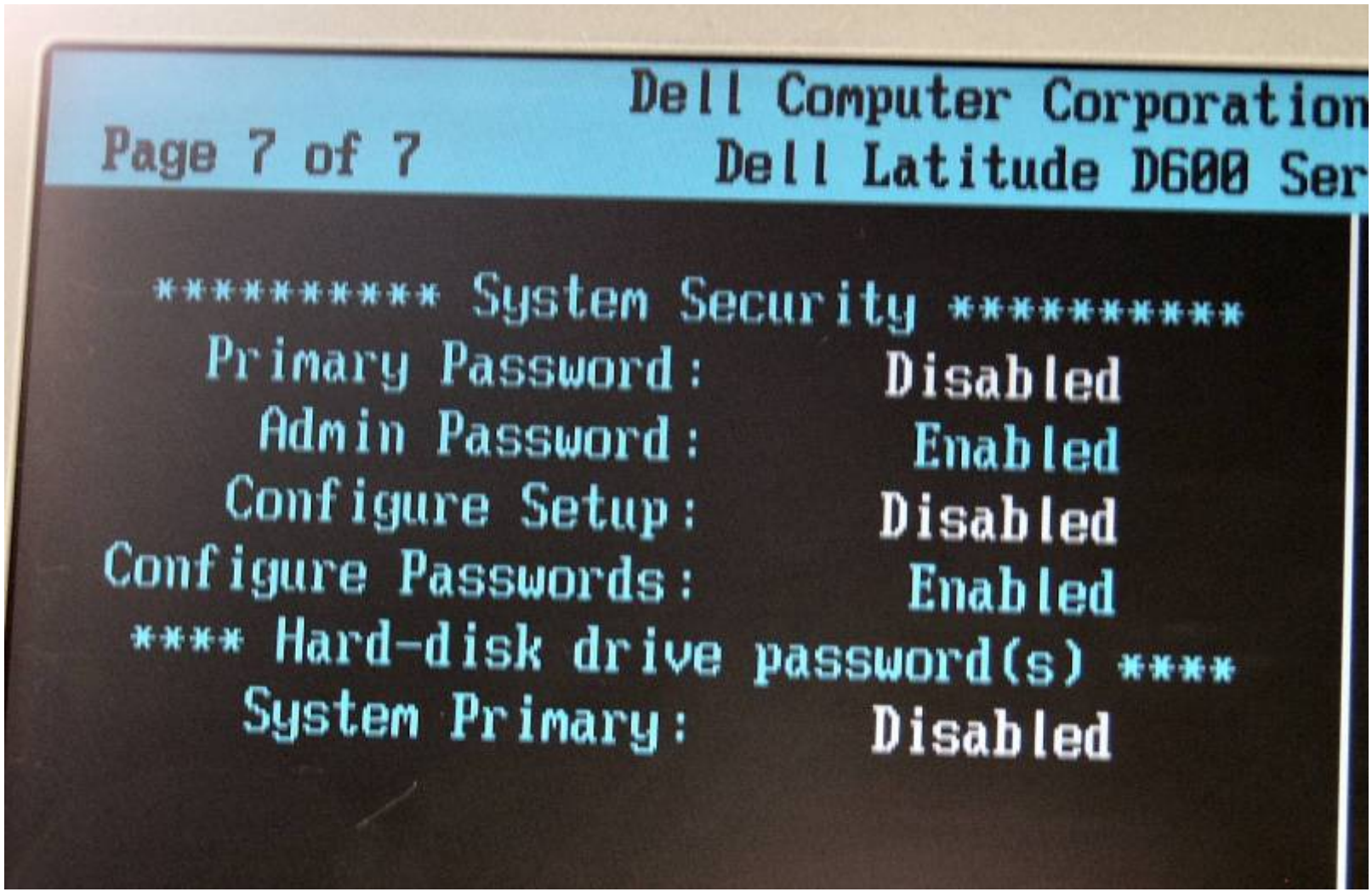
No CD boot possible, but we have access to CMOS



Only the hard disk is enabled



Config is password protected, but the hard disk is not



So let’s take out the hard disk …

.. And read it in our laptop!

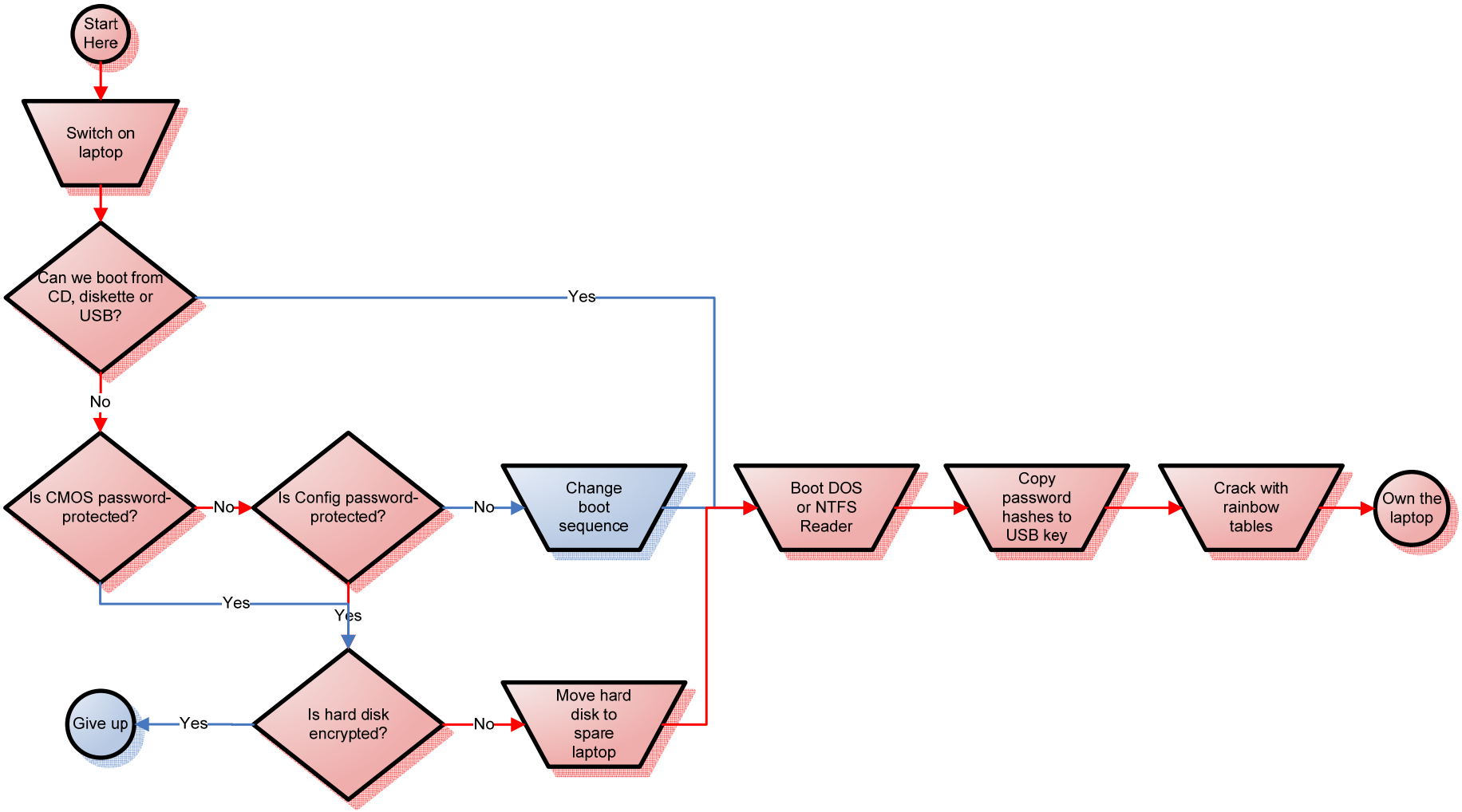

```
 Volume Serial Number is 07D4-040E

 Directory of C:\WINNT\SYSTEM32\CONFIG

.                   <DIR>  04-14-2004  8:43a
..                  <DIR>  04-14-2004  8:43a
APPEVENT EVT        524,288  09-03-2006  1:51p
DEFAULT             196,608  09-01-2006  5:51p
DEFAULT  SAV         81,920  07-10-2003  1:47p
SAM                  28,672  09-03-2006  1:51p
SECEVENT EVT         65,536  04-14-2004  9:03a
SECURITY             40,960  09-03-2006  2:47p
SOFTWARE         27,942,912  09-03-2006  2:47p
SOFTWARE SAV        536,576  07-10-2003  1:47p
SYSEVENT EVT        524,288  09-03-2006  1:51p
SYSTEM            5,140,480  09-03-2006  2:47p
SYSTEM   ALT      5,140,480  09-03-2006  2:47p
SYSTEM   SAV        352,256  07-10-2003  1:47p
USERDIFF            139,264  07-10-2003  1:47p
       13 file(s)     40,714,240 bytes
        2 dir(s)      13,254 Mega bytes free

C:\WINNT\SYSTEM32\CONFIG>_
```

That was the longer route!



So what now?

- What sensitive information can we steal?
- What credentials can we steal?
- Can we connect to the corporate network?
- Can we introduce a Trojan?

What sensitive information can we steal?

- Almost anything on the hard disk!
  - MS Office passwords are no protection
  - Neither are zip files (usually)
  - Windows EFS may not protect you either

- But we cannot see data that has been encrypted using a proven algorithm
  (e.g. PGP volumes)

What credentials can we steal?

- Almost anything on the hard disk!
  - All local Windows password hashes
  - Cached Windows logons
  - Dial-up credentials
  - E-mail passwords
  - Cached web credentials
  - Etc.

Can we connect to the corporate network?

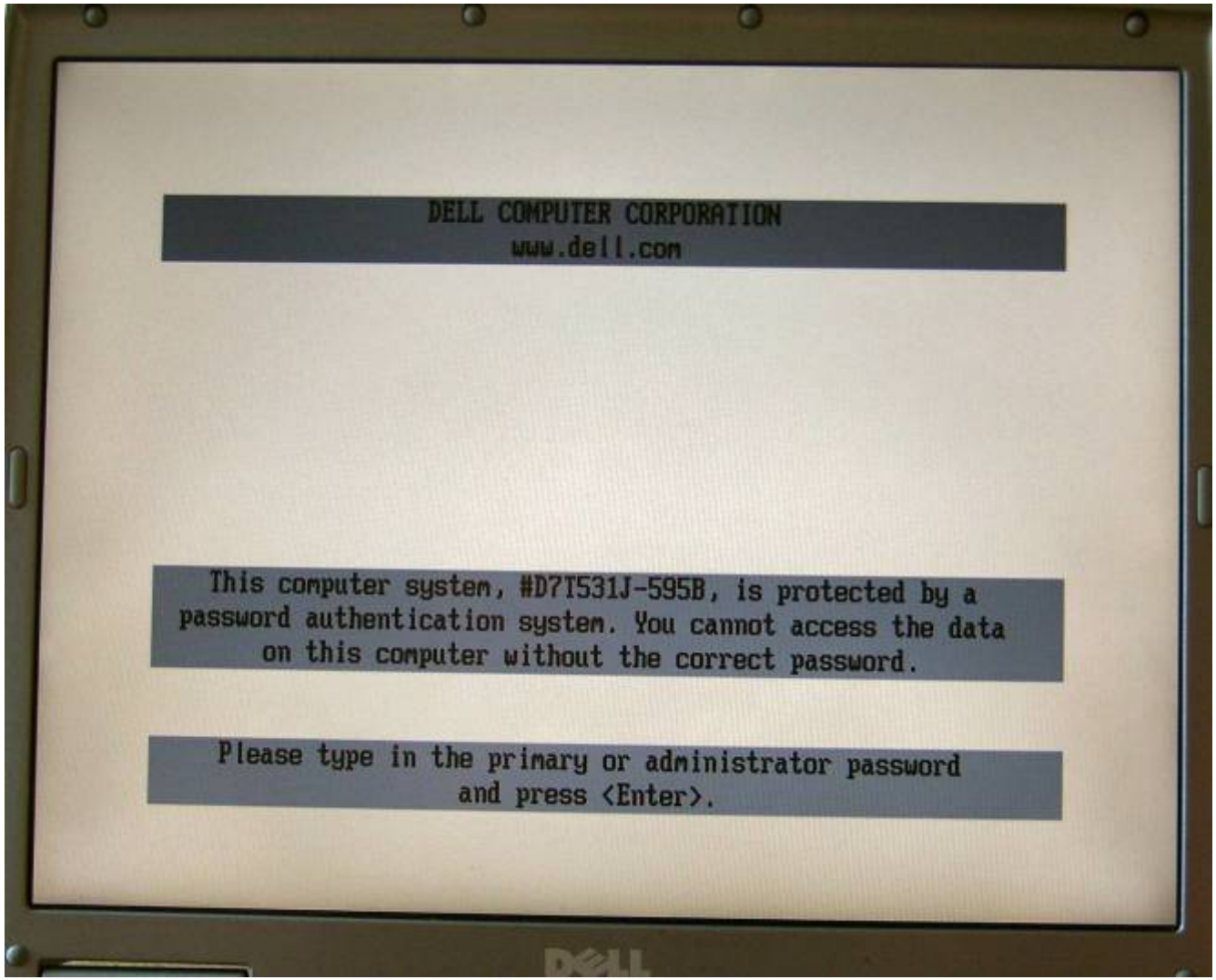
- Very probably!
  - We know the local Windows passwords
  - If you use two-factor authentication, where is your SecurID card and PIN kept?
  - Perhaps the help desk will be very helpful?
  - Perhaps we can use a Trojan to get access later

Can we introduce a Trojan?

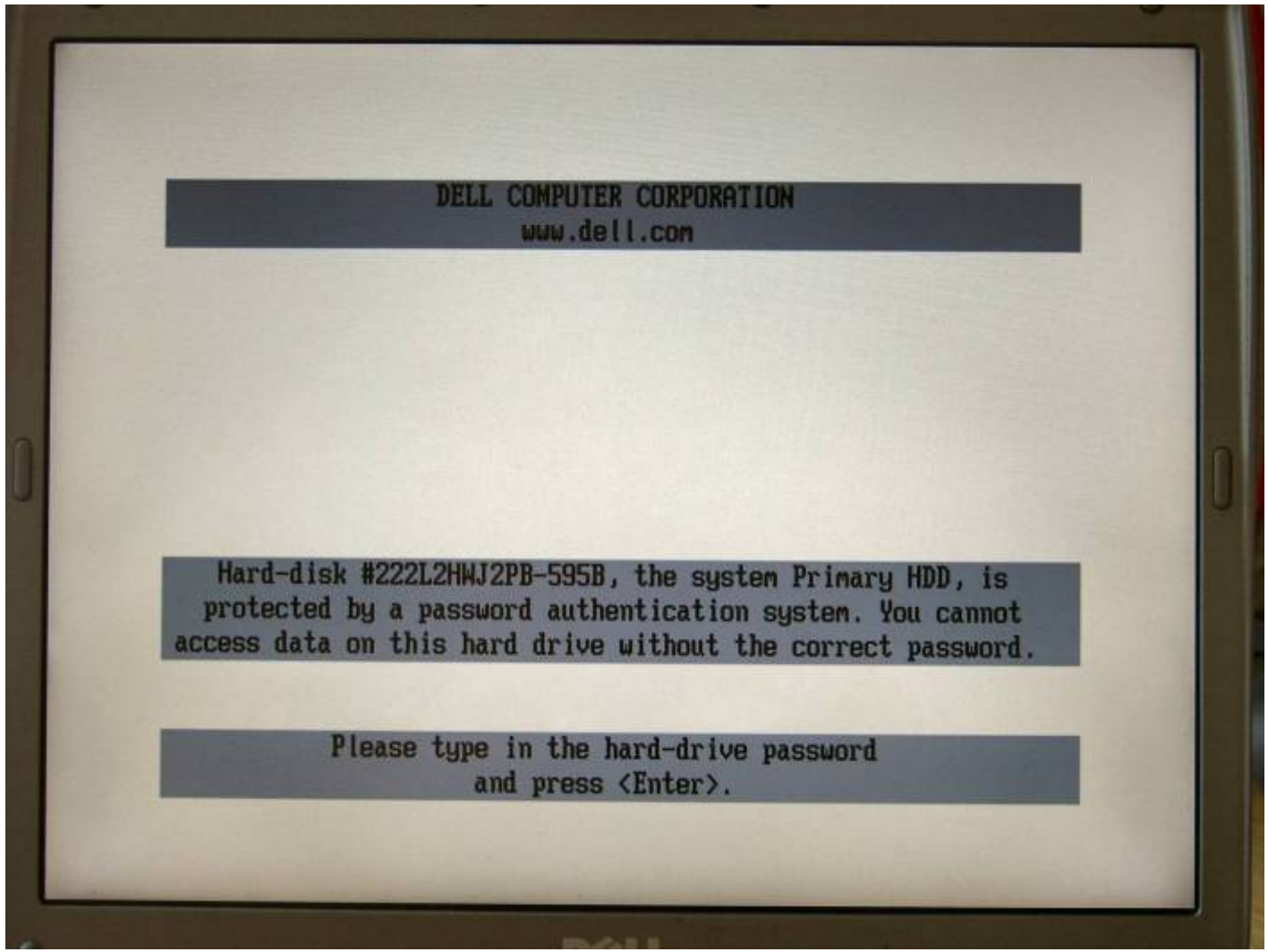
- Since we are local Administrator, yes!
  - We can turn off anti-virus
  - We can turn off the personal firewall
  - We can hide the Trojan using a rootkit
- Game over!

However …

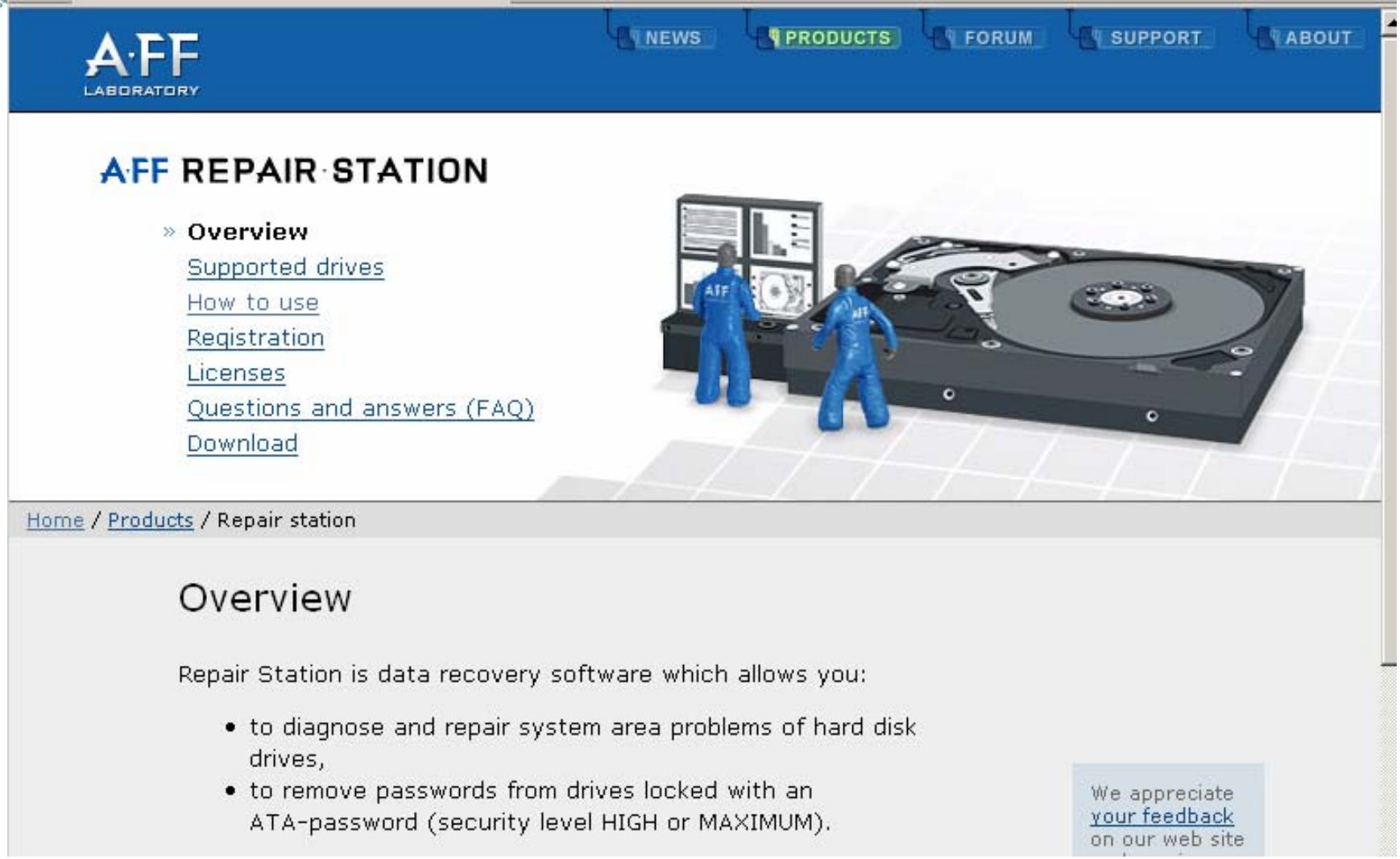
If there's no access to CMOS …



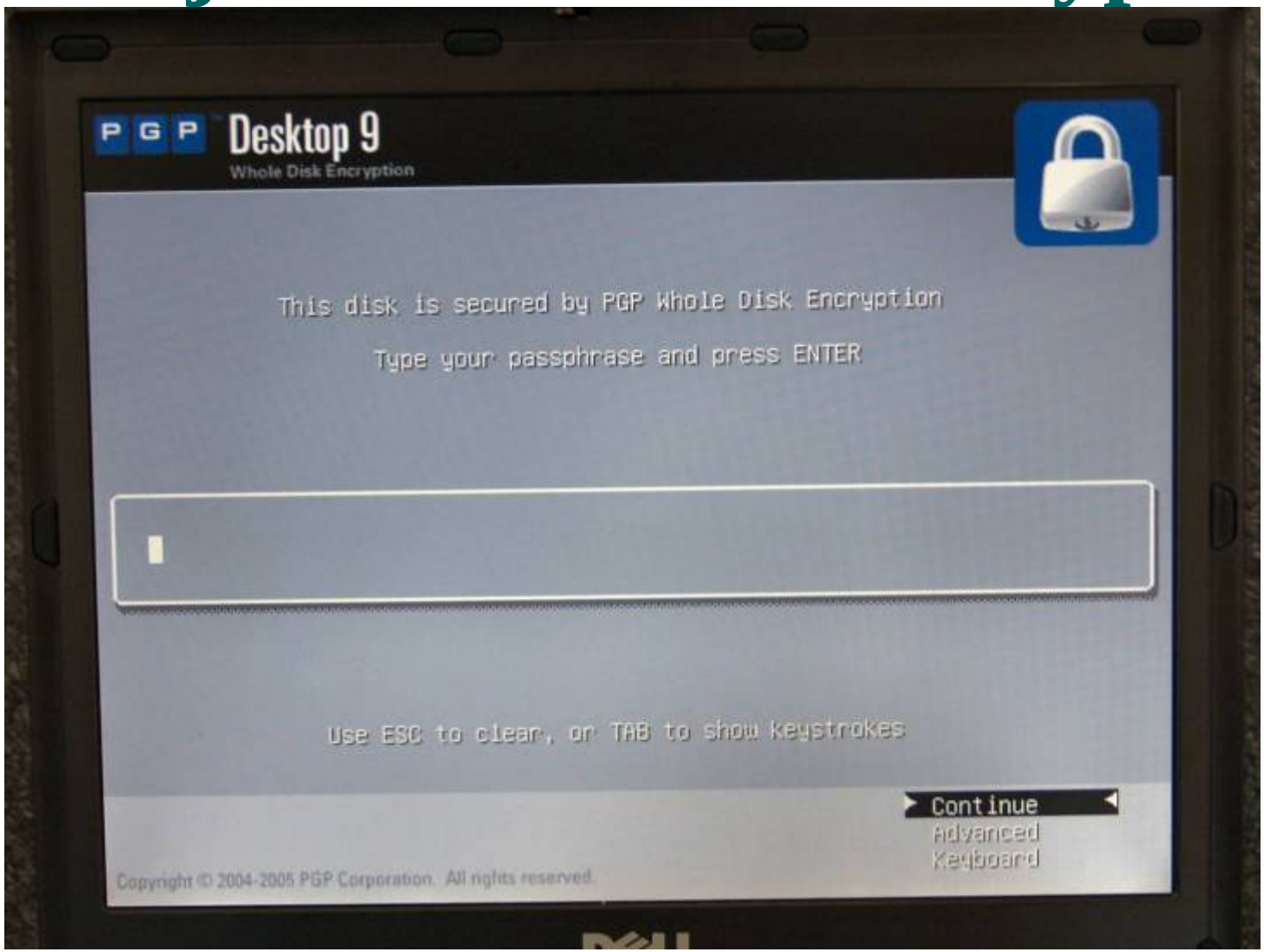
… and a password-protected disk



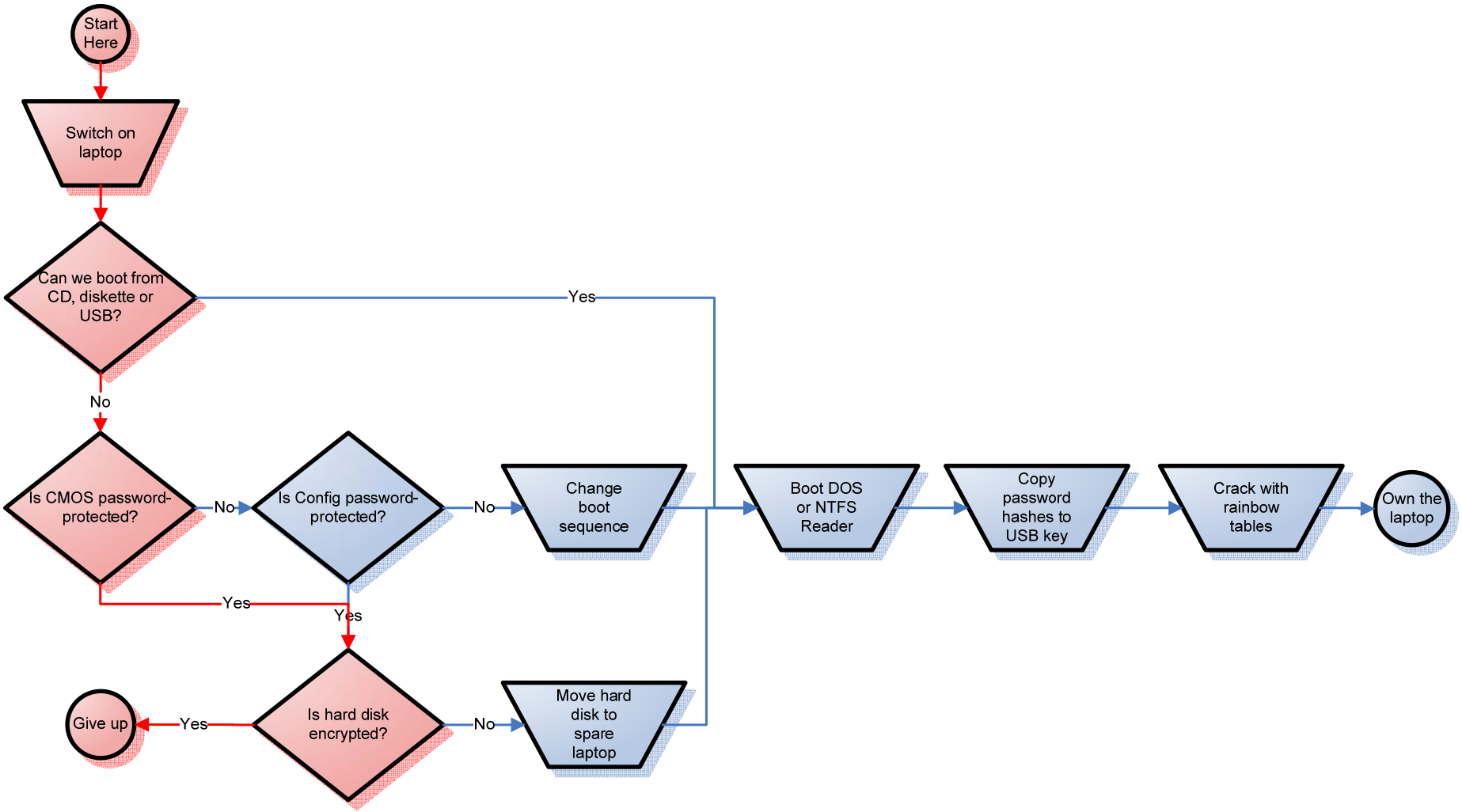
ATA Password Reset



Or … just whole disk encryption



That was the route to failure!



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