DAMBALLA

Factoring Malware and Organized Crime in to Web Application Security

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- Is malware a threat to Web apps?
- What malware are criminals using?
- How to botnets factor in to this?
- How do you use a botnet in Web app attacks?
- What should you be doing about this?

Web AppSec vs. Malware

- **This is OWASP – who cares about malware?**
  - Need to answer **"why"** someone breaks a Web application…
  - **"How"** is tied to *ease* and *probability of success*
- **The world we live in…**
  - Iframe injections – avg. 100,000+ "defacements" per week
  - Larger attacks of up to 1.5m SQL Injection-based "defacements"
  - Botnets and their agents – somewhere between 10-200m
    - Storm "worm" of up to 10m bots…
    - I think the estimates are too high – probably in the realm of 4m-12m worldwide (once you remove multiple pwn3d hosts)
  - Identity information can be purchased from as little as 5 cents per record

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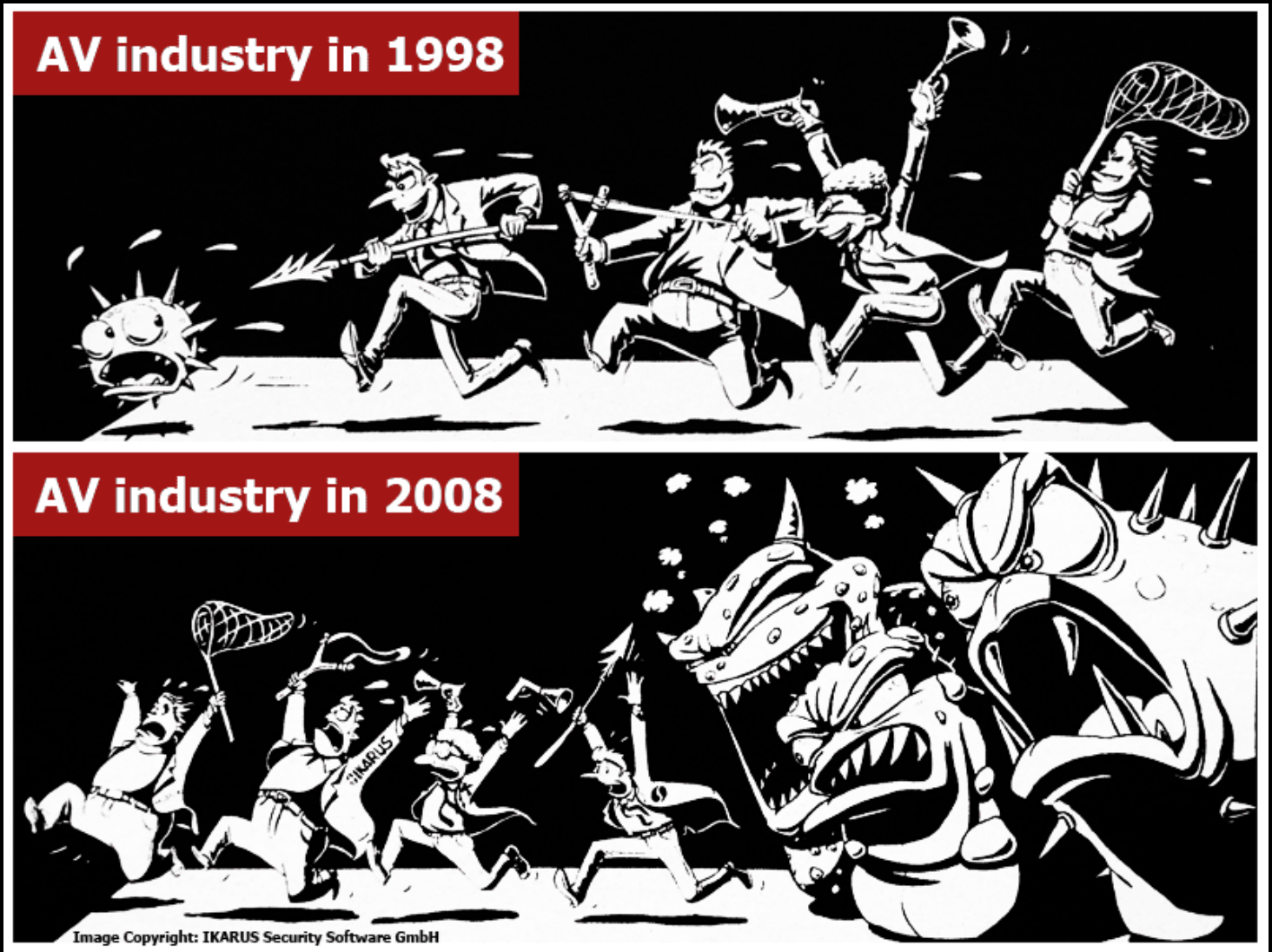
Malware's Changing Face




Is malware a threat to
Web application security?

Malware & Web App Security

- **Why is malware important to Web application security?**
  1. It makes secrets impossible
  2. You can't trust your users
  3. Vehicle for automated attack

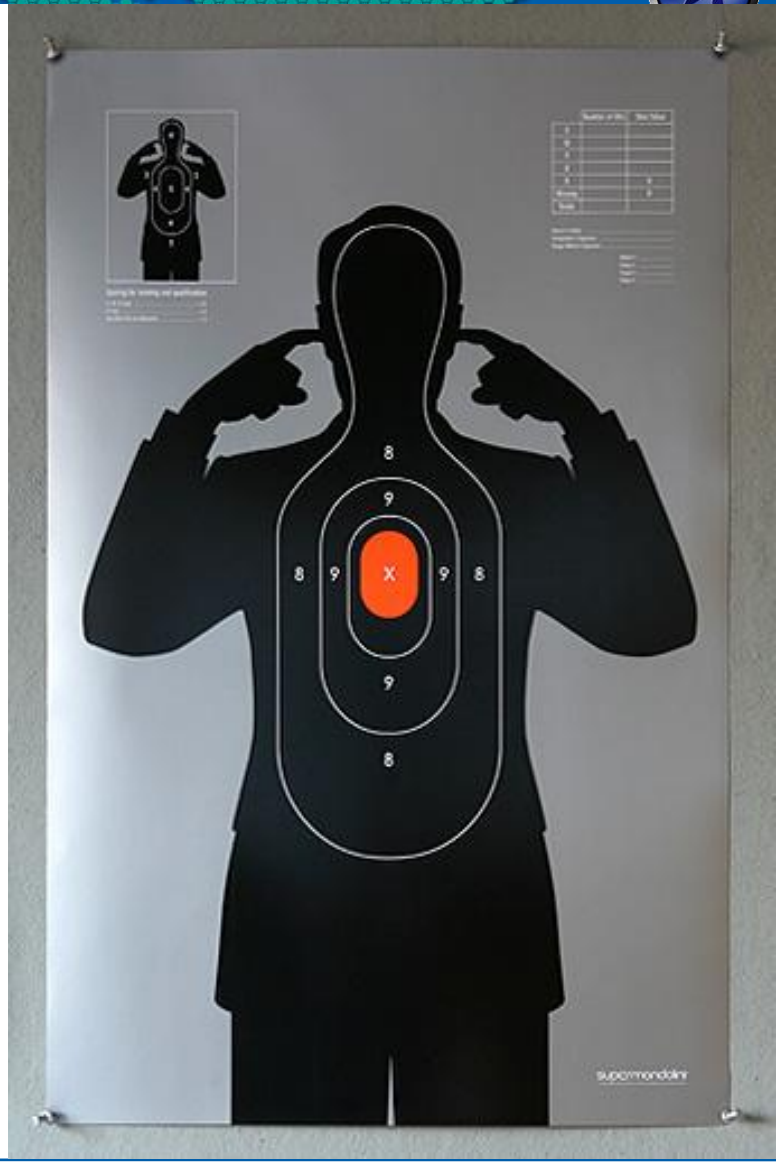
- **Not factoring it in to the design will cause a lot of pain later…**

The Malware Threat

- **What's the malware doing today?**
  - Bypassing client-side authentication to apps
  - Spoofing content on the users behalf
  - Impersonating large groups of users simultaneously
  - Anonymous & globally proxied attacks
  - Distributed attacks & federated problem solving
  - Efficient brute-forcing technologies

Why target Web applications?

- **Web applications are where the money is…**
  - Online Banking
    - Funds transfers and money laundering
  - Online Shopping
    - Purchase fraud, money laundering and supply chain
  - News/Information Portals
    - SEO attacks, money market manipulation & recruitment
  - Joe's Boring Page
    - Infection & recruitment vectors and PII fire-sale



Learning from Online Banking

- Vulnerabilities in the Web banking application are *more* than *code injection vectors* and *authentication bypasses…*
- Poor *application flow* and a complex *user experience* are the bread & butter of today's *criminal exploitation* of Web banking applications


#1 Vector
Application
Complexity

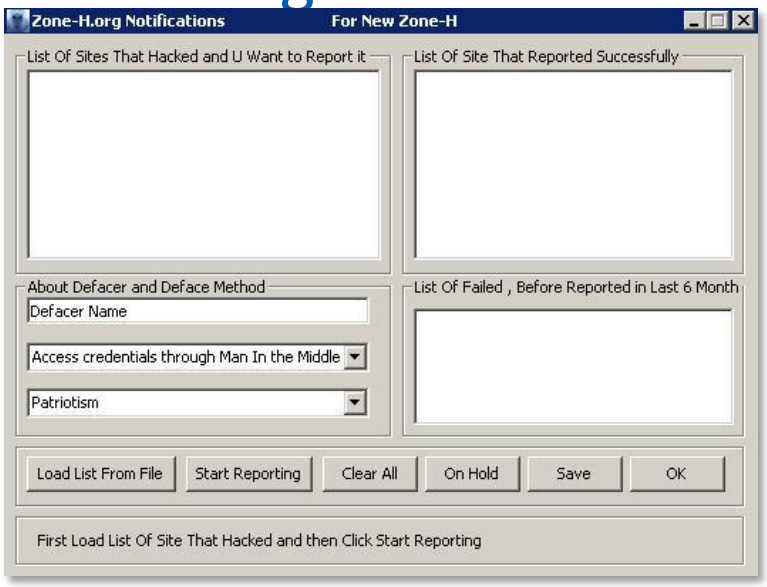
Application Complexity

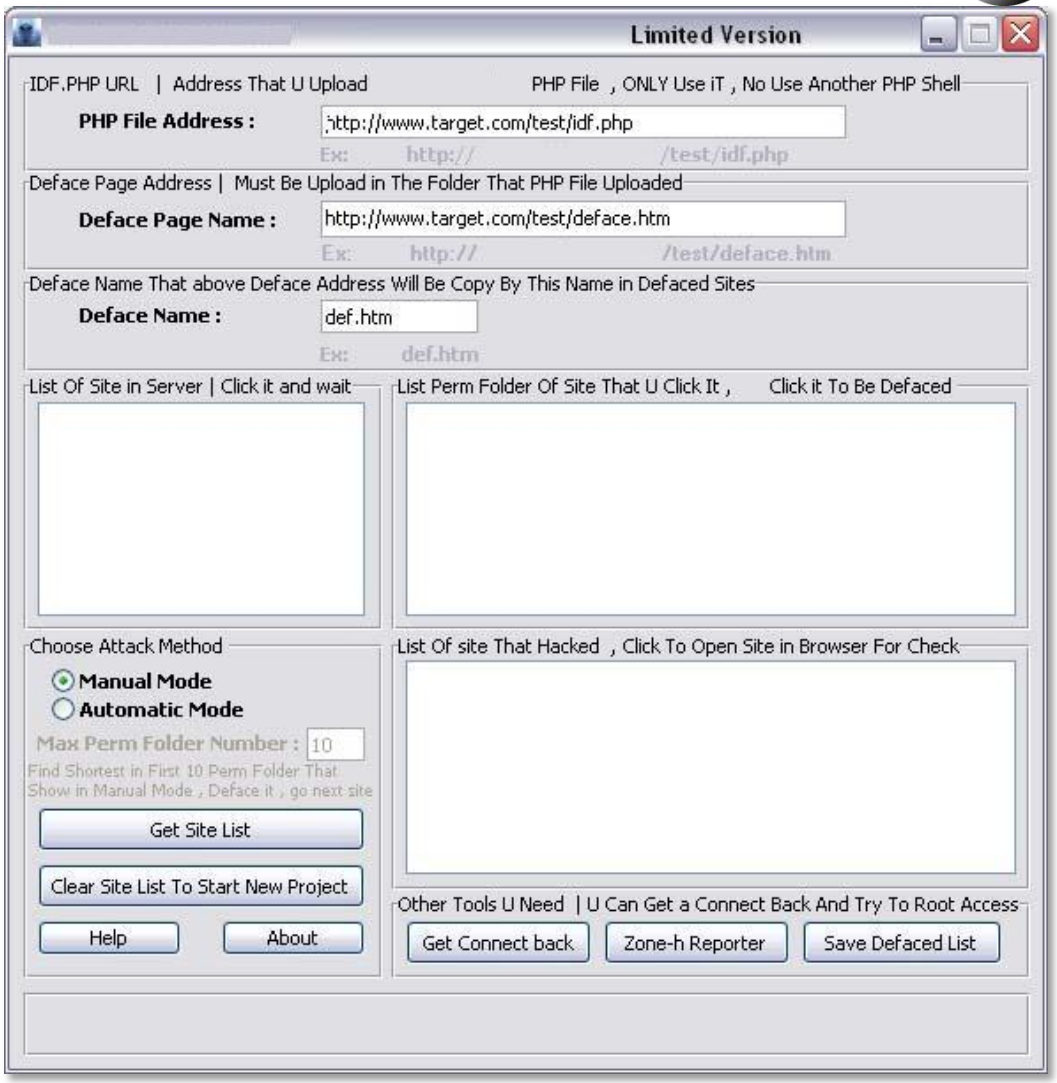
- How many steps must the user go through?
- How do they know if a new step has been introduced?
- How are error messages handled?
- What gets in the way of just “doing it”?

What crimeware are criminals using?

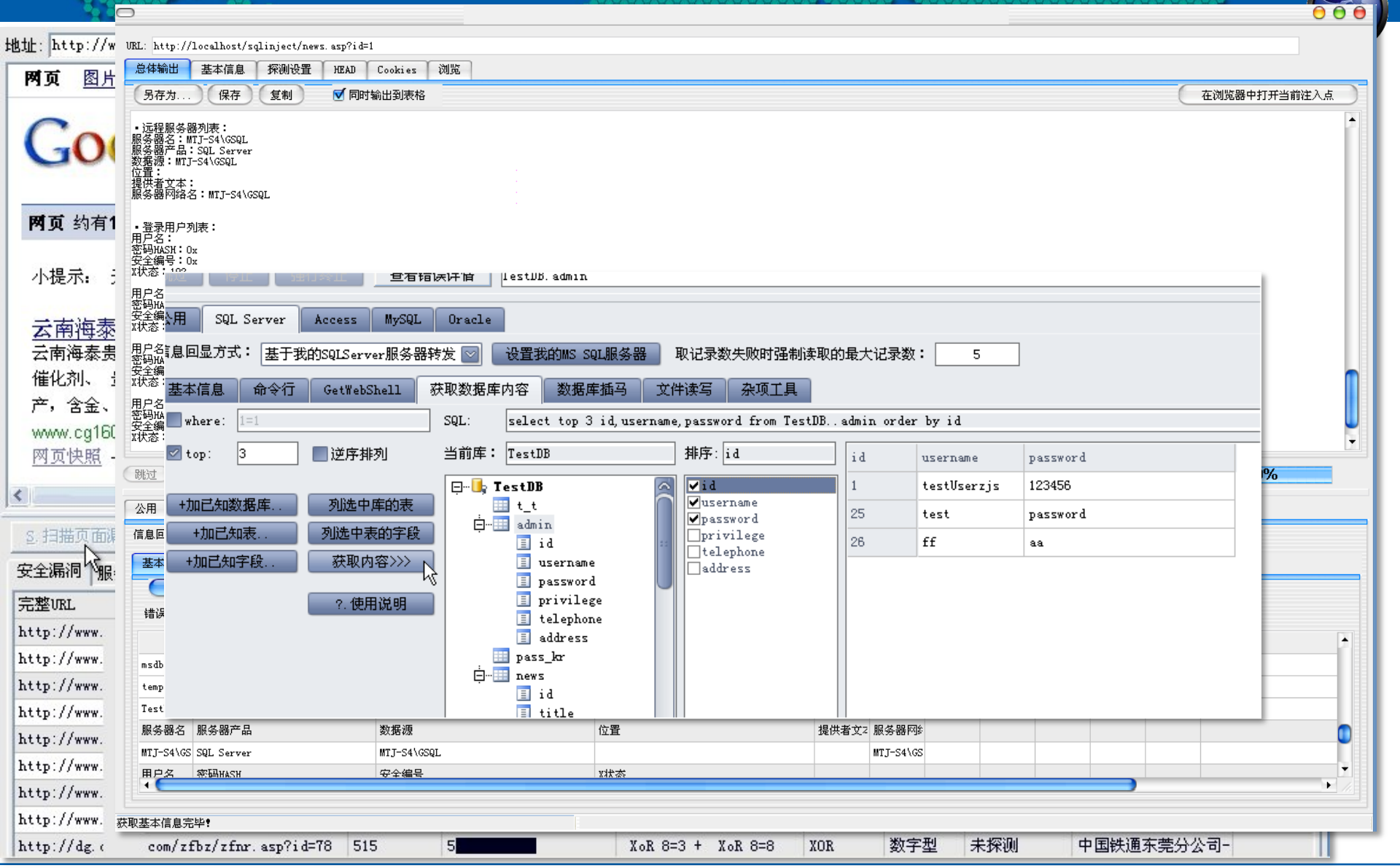
Commercial Web defacement

- **Tools that speed up the defacement process**
  - Not necessarily targeted



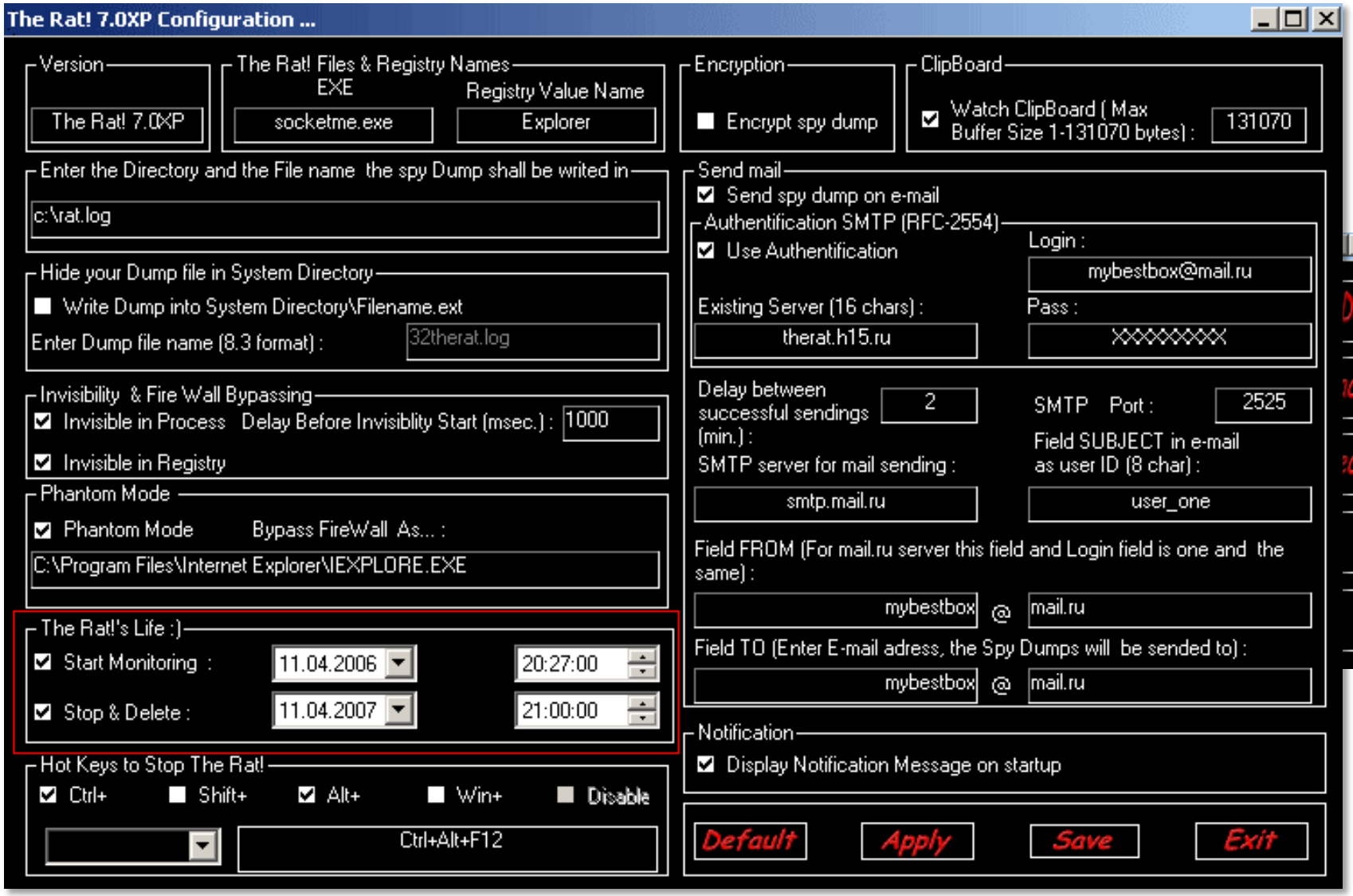


SQL Injection Attack Tools



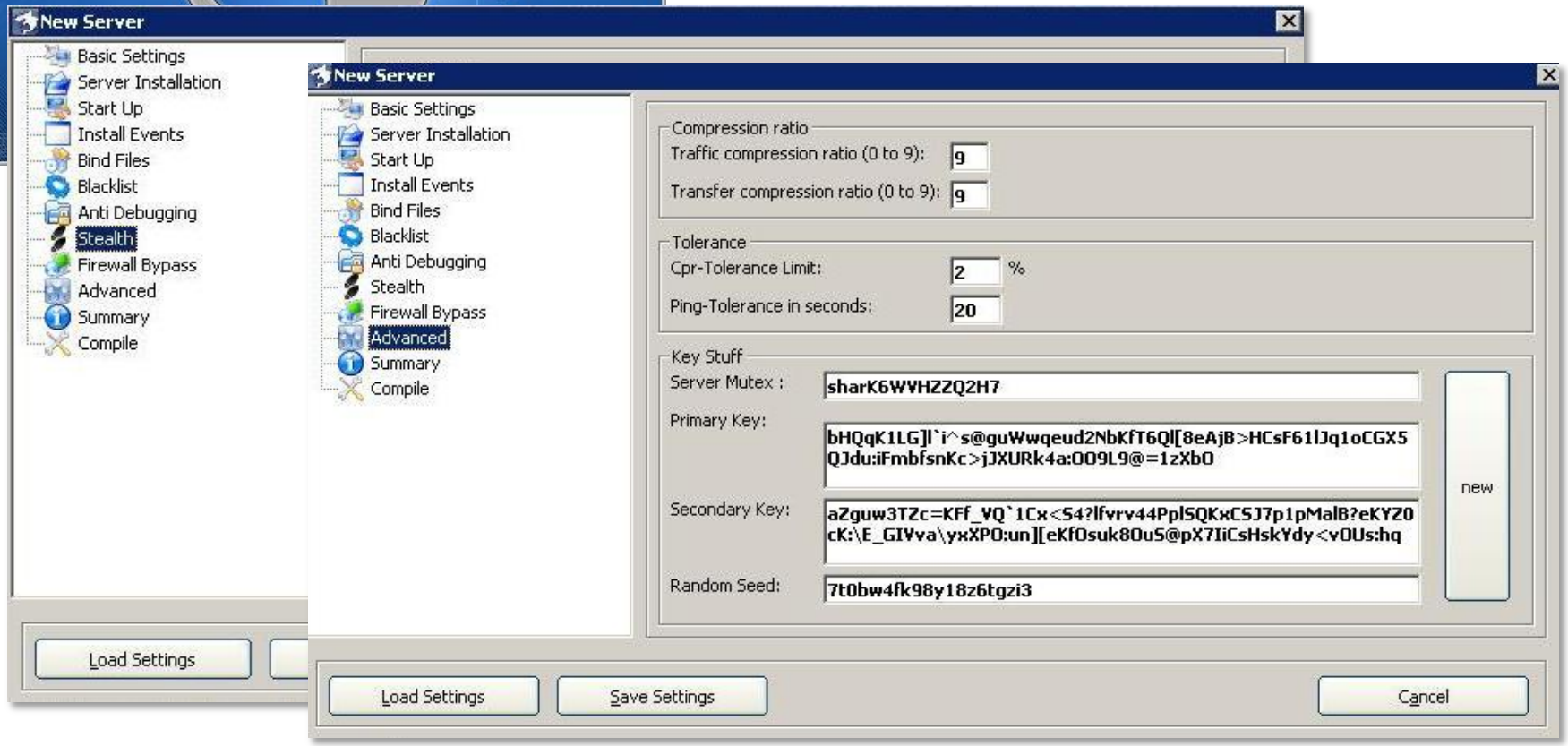

Getting Started
with Malware…

Keylogger Creators



Malware creator kits – Shark 3 (Jan '08)

- "Remote Administration Tool" – RAT
- Added anti-debugger capabilities
  - VmWare, Norman Sandbox, Sandboxie, VirtualPC, Symantec Sandbox, Virtual Box etc.



- **Construc**
- **V.4 New**
  - Remo
  - Webc
  - Audio
  - Remo
  - MSN
  - Remo
  - Advar
  - Onlin
  - Inforr comp
  - Etc..

Bronze Edition

- This product is the improved version of Turkojan 3.0 and it has some limitations(Webcam - audio streaming and msn sniffer doesn't work for this version)
- 1 month replacement warranty if it gets dedected by any antivirus
- 7/24 online support via e-mail
- Supports only Windows 95/98/ME/NT/2000/XP
- Realtime Screen viewing(controlling is disabled)

Price : 99$ (United State Dollar)

Silver Edition

- 4 months (maximum 3 times) replacement warranty if it gets dedected by any antivirus
- 7/24 online support via e-mail and instant messengers
- Supports 95/98/ME/NT/2000/XP/*Vista*
- Webcam streaming is avaliable with this version
- Realtime Screen viewing(controlling is disabled)
- Notifies changements on clipboard and save them

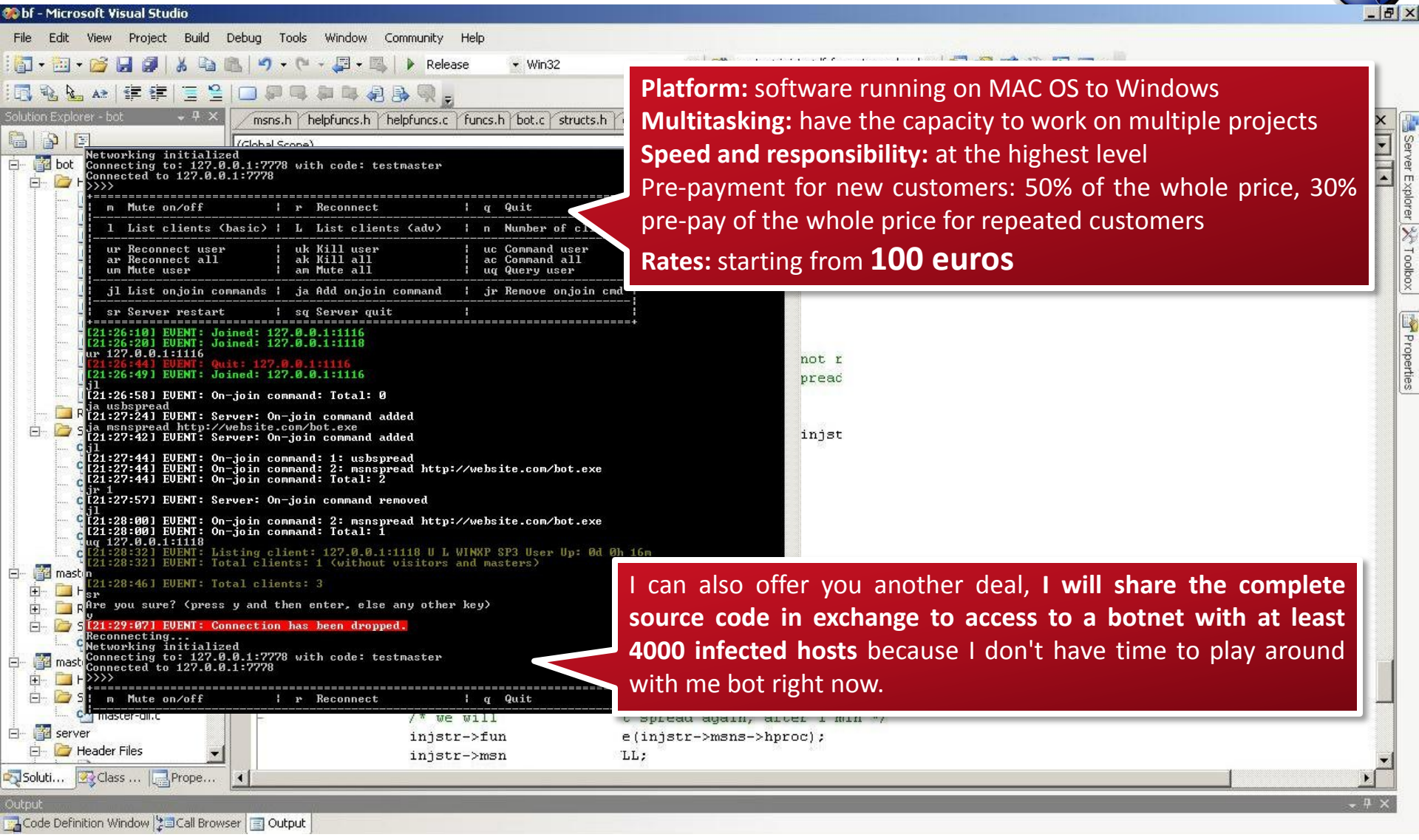
Price : 179$ (United State Dollar)

Gold Edition

- 6 months (unlimited) or 9 months(maximum 3 times) replacement warranty if it gets dedected by any antivirus (you can choose 6 months or 9 months)
- 7/24 online support via e-mail and instant messengers
- Supports Windows 95/98/ME/NT/2000/2003/XP/*Vista*
- Remote Shell (Managing with Ms-Dos Commands)
- Webcam - audio streaming and msn sniffer
- Controlling remote computer via keyboard and mouse
- Notifies changements on clipboard and save them
- Technical support after installing software
- Viewing pictures without any download(Thumbnail Viewer)

Price : 249$ (United State Dollar)

Hire-a-Malware-Coder (Custom Build)



Platform: software running on MAC OS to Windows
Multitasking: have the capacity to work on multiple projects
Speed and responsibility: at the highest level
Pre-payment for new customers: 50% of the whole price, 30% pre-pay of the whole price for repeated customers
Rates: starting from **100 euros**

I can also offer you another deal, **I will share the complete source code in exchange to access to a botnet with at least 4000 infected hosts** because I don't have time to play around with me bot right now.

Hire-a-malware-coder Pricing

- **Other models exist for hire-a-malware-coder pricing**
- **Component/functionality based pricing**
  - Loader €300
  - FTP & Grabber €150
  - Assembler Spam bases €220
  - Socks 4/5 €70
  - Botnet manager €600
  - Scripts €70
  - Assembler password stealers (IE, MSN, etc.) €70
  - AV-remover €70
  - Screen-grabber €70

Rules / License

-- Customer has no right to transfer any of his three 3 persons except options for harmonizing with me

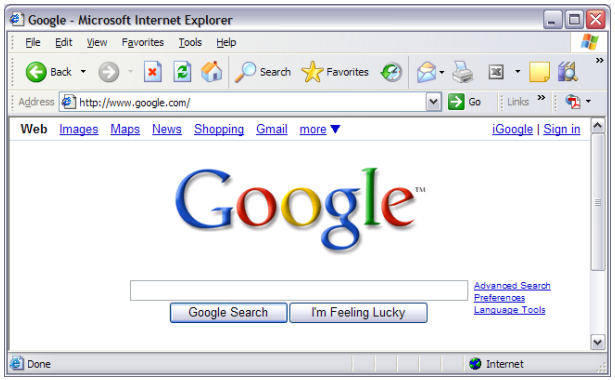
-- Customer does not have the right to make any decompile, research, malicious modification of any three parts

-- Customer has no right where either rasprostanyat information about three and a public discussion with the exception of three entries.

-- For violating the rules - without any license denial manibekov and further conversations"

Looking for a soft target?

Intercepting Traffic – Man-in-the-browser



System Reconfiguration
DNS Settings, Local HOST file, Routing tables, WPAD and Proxy settings

Trojan Application
Local Proxy Agent

OS Hooking
Keyloggers, Screen grabber

TCP/IP Stack Interception
Packet inspection, pre/post SSL logging

Man-in-the-browser
Malware hooks inside the Web browser

Traditional Malware
Operates and intercepts data at points through which the Web browser must communicate

API Hooking Malware

Clean System

Application
The Web browser

WinInet
httpsendrequest(), navigateto()

Winsock
TCP/IP stack

Internet

Infected System

Application
The Web browser

Malware
Proxying Web browser data

WinInet
httpsendrequest(), navigateto()

Winsock
TCP/IP stack

Internet

Manipulate
Copy, redirect, script, change, insert, sell.

MITB – Grabbing Login Credentials

- **Steal login credentials, and ask for more…**

Pre-login	Login	Post-login
First page of login sequence is manipulated	Multiple fields & pages added to the login sequence	Authenticated user asked additional security questions

- **Requests for additional data are easy to socially engineer**
  - Ask for credit/debit card details, including PIN and CVV
  - Additional "security" questions – SSN, mothers maiden name, address, home phone number, mobile/cell phone number
  - Type in all numbers of one-time-keypad scratch-card
  - "Change password" for anti-keylogging partial-password systems
  - "Test" or "resynchronize" password/transaction calculators

- **SSL/TLS encryption bypassed, "padlock" intact**


By way of example…
Online Banking

Traditional Banking Malware

- **Focused on stealing login information**
  - Bank number, UID, password(s), session keys
- **Techniques include:**
  - Keylogging, screen-grabbing, video-recording of mouse movements
  - Redirection to counterfeit site (domain/host substitution)
  - Replacement and pop-up windows
  - Session hijacking (duplicating session cookies)
  - Screen overlays (superimposed counterfeit web forms)