Malicious Code on Linux-Based Systems

iDefense Intelligence Operations

November 17, 2005

Where it all comes together.

Presentation Agenda

- About iDefense
- Linux Based Malicious Code
  - History
  - Trends
  - Recent Developments
  - Future Developments
- Q&A

About iDefense: Overview

- iDefense, a VeriSign Company, is a leader in cyber threat intelligence
- Industry-Leading Service Offerings
  - Intelligence is all that iDefense does
- Marquee Customer and Partner Base
  - Government, financial services, retail, telecom and others
- Experienced Intelligence Teams
  - iDefense Labs
  - Vulnerability Aggregation Team (VAT)
  - Malicious Code (Malcode) Team
  - Threat Intelligence Team
  - Rapid Response Team
- In business since 1998, iDefense became a VeriSign Company in July 2005

iDefense – Trusted Experts

"…some of the most incisive analysis in the business, particularly about Russian hackers." – *BusinessWeek*

"iDefense, which generates cybercrime intelligence for government and financial industry clients." – *NY Times*

"..by then iDefense had sifted out the 20 culprit PCs, breaking the state-of-the art encryption…and handing the information to the DHS, FBI and Canadian law enforcement officials." – *Forbes*

"So far this year, the company is credited with the responsible disclosure of 36 security bulletins, including major flaws in products sold by CA, RealNetworks and Apple." – *eWEEK*

iDefense Intelligence Services

Daily / Hourly Research Deliverables

- Comprehensive Vulnerability Feed
  - Most comprehensive, timely, technical feed in the industry
- iDefense Exclusive Vulnerabilities
  - 250+ contributors around the globe
  - Released to vendor and iDefense customers only
  - More than 160 iDefense Exclusive vulnerabilities so far in 2005
- Malicious Code Research and Reporting

iDefense Intelligence Services

Weekly / Semi-Monthly Research deliverables

- Weekly Threat Report
    - Weekly compilation of worldwide threats
    - Critical Infrastructure, State of the Hack, Cyber Crime, Terrorism and Homeland Security, Global Threat
- iDefense Topical Research Papers
    - Examples:
        - Security of Enterprise Web-Based E-Mail Interfaces
        - Security Comparisons: Internet Explorer vs. Firefox
        - Phishing and Pharming: A Comparison
        - Mitigating the Threat from Keyloggers
- Focused Threat Intelligence Reporting
    - Topics specific to individual customers

iDefense Exclusives – Last 12 Months

- 200+ Submissions Confirmed and Verified
  - Have been published or submitted to clients and the vendor
- 13 Microsoft exclusives have gone public in 11 different MS05-xxx Microsoft Bulletins
  - 11/52 (21%) Microsoft Bulletins in 2005 have included our vulnerabilities
- 119 days average lead time for Microsoft issues
  - Customers had workarounds 119 days before the advisory was public
  - 45 days average lead time across all vendors

Total Number of Malicious Code in 2005

- TOTAL: 13,224
  - Extreme: 1
  - HIGH: 38
  - MEDIUM: 327
  - LOW: 12,858
- Spyware: 259
- Adware: 311

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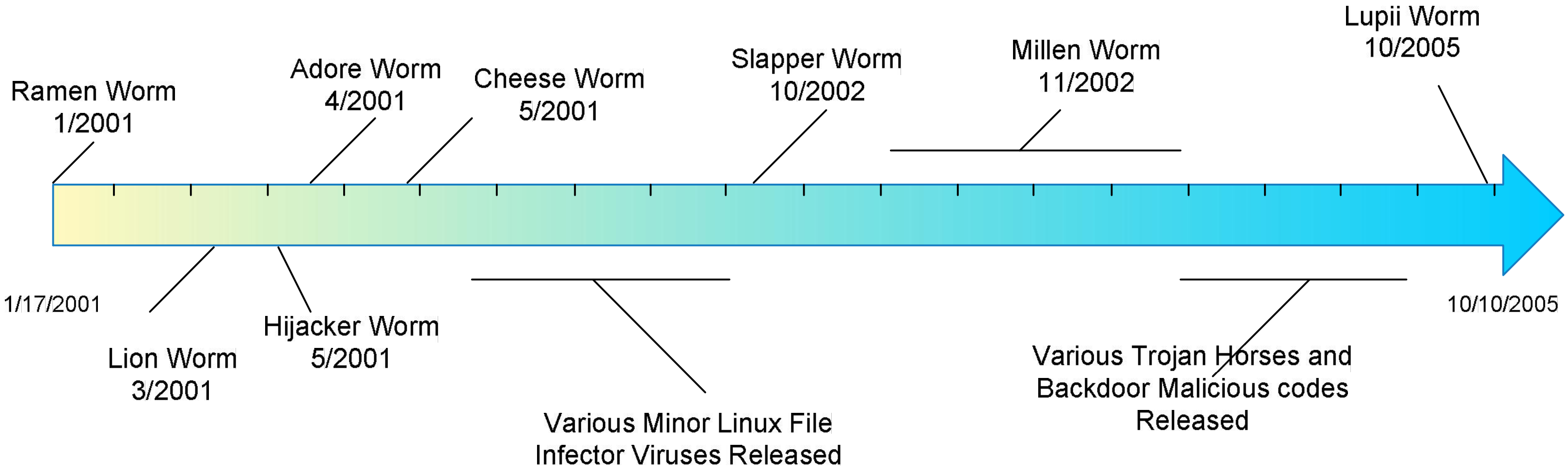
History


Ramen Worm
1/2001
Adore Worm
4/2001
Cheese Worm
5/2001
Slapper Worm
10/2002
Millen Worm
11/2002
Lupii Worm
10/2005
1/17/2001
Lion Worm
3/2001
Hijacker Worm
5/2001
Various Minor Linux File Infector Viruses Released
Various Trojan Horses and Backdoor Malicious codes Released
10/10/2005

Notable Linux Based Malicious Code

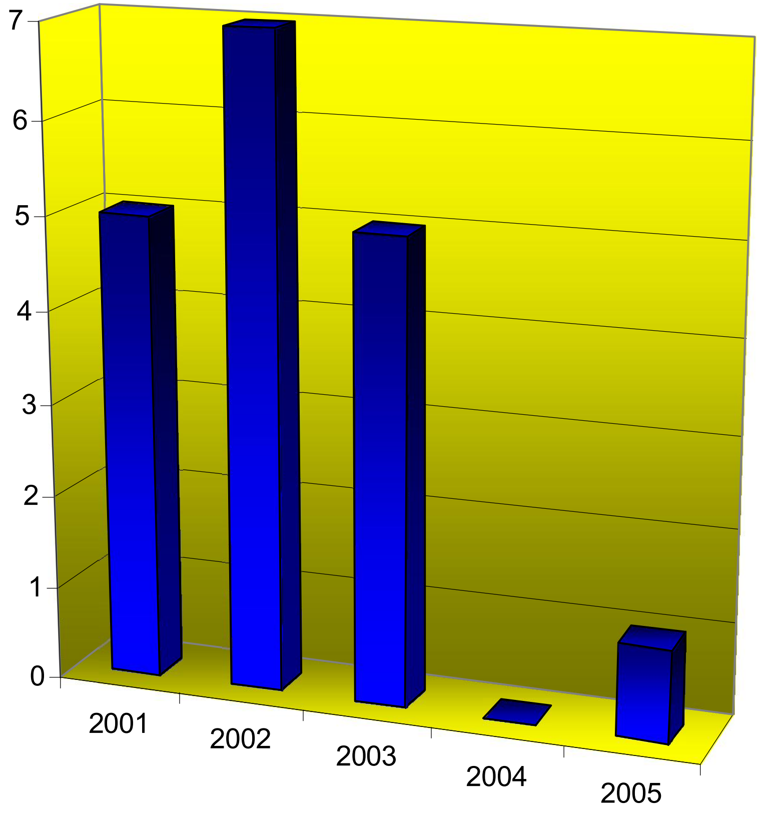
- Ramen Worm (January 2001)
  - First Real Linux Worm
  - Targeted three vulnerabilities in only one OS (Red Hat 6.2 and 7.0)
  - Only defaced the ***index.html*** file on the web server of the infected machine
- Svat Virus (May 2002)
  - Infects both PE and ELF executables

Notable Linux Based Malicious Code

- Similie Virus (May 2002)
  - Entry-point obscuring, metamorphism and polymorphic decryption, infects both PE and ELF executables
- Slapper Worm (October 2002)
  - Exploits an Apache SSL vulnerability
  - Targets multiple flavors of Linux
  - Performs DDoS attack

Trends

- Overall decrease in the number of code targeting Linux



Trends

- First Linux worm targeted vulnerabilities in the base OS; all worms since have targeted third-party applications
- Popular open-source packages have been the biggest target of these worms
- Linux malicious code has not been popular with malicious code writers for several years

Recent Developments - Conclusions

- Lupii Worm (November 2005)
  - Three variants to date
  - Downloads ELF binary, no destructive payload
  - Targets three vulnerabilities in third party Linux Applications

Lupii Worm – Vulnerabilities Exploited

- XML-RPC for PHP Code Injection Vulnerability
  - Input validation vulnerability resulting from a quote mismatch, allowing attackers to escape data and inject code
  - Numerous OS's and applications utilize vulnerable code
- AWStats Rawlog Plugin Input Validation Vulnerability
  - Open-source tool for generating web, FTP or mail server statistics graphically
  - Lack of sanitization of logfile URL data passed to awstats.pl allows for passing of shell meta-characters directly to server
- Webhints Remote Command Execution Vulnerability
  - Open-source tool for generating hint scripts
  - Lack of sanitization of user input allows for code execution

Future Developments

- No great increase in Linux targeting malicious code
- Whatever does appear will be likely target third-party applications, especially open-source ones
- Source code repositories will be a target for malicious code writers

Q & A

Where it all comes together.™