"Extreme IP Backtracing"

By Lawrence Baldwin & Jaeson Schultz

I've been attacked... now what?

The reality is that few attacks are launched directly from an attacker's system since they know they would be easily caught using standard backtracing methods.

The Internet is chock full of insecure systems which are easily (read already) compromised, providing a means for attackers to perform untraceable, indirect attacks.

The only profound way to improve overall Internet security is to:

- Reduce the total number of compromised hosts
- Minimize the amount of time that any system remains in a compromised state

In order to protect ourselves, we need to ensure that others are protected.

Every time your firewall or intrusion detection system logs an event, don't assume the source is the actual attacker.

Think of it as a cry for help from a likely victim whose system has been compromised and is just being controlled by an attacker.

When we discover that someone is obviously exposed, we should let them know and guide them to the information they need to get protected.

“Authorities pursuing the attackers say the servers they used belonged to users that had no idea their resources were being used to launch attacks.”

CNN.com article “Avoiding future denial-of-service attacks”
*about the Feb 2000 DDOS attacks on Yahoo, eBay, Amazon.com and E*Trade*

Why notify victims?

Recently, myNetWatchman detected an incident in which a host was infected with the Microsoft SQL Spida Worm. A backtrace of the offending IP yielded some interesting results…

```
% This is the RIPE Whois server.
% The objects are in RPSL format.
% Please visit http://www.ripe.net/rpsl for more information.
% Rights restricted by copyright.
% See http://www.ripe.net/ripencc/pub-
services/db/copyright.html

inetnum:        194.190.139.0 - 194.190.139.255
netname:        GAN
descr:          Central Region of GAN RF
country:        RU
admin-c:        AV753-RIPE
tech-c:         AV753-RIPE
status:         ASSIGNED PA
notify:         sam@gan.ru
notify:         ip-reg@ripn.net
mnt-by:         ROSNIIROS-MNT
changed:        ip-dbm@ripn.net 19991018
source:         RIPE
```

GAN=The Nuclear Safety Authority of Russia

"Federal supervision of Russia on nuclear and radiating safety (Gosatomnadzor of Russia) as the federal enforcement authority, organizes and carries out state regulation of safety at use of an atomic energy, nuclear materials, radioactive substances and products on their basis in the peace and defensive purposes (except for regulation of the activity connected to development, manufacturing, test, operation of the nuclear weapon and nuclear power installations of military purpose(assignment)). "

The Backtracing Process

Source IP Validation

Confirm the Source of Traffic

- **Local Network**
- **Extended Local Network (e.g. cable modem neighbor)**
- **Internet**

Exclude the 'Martian Addresses'

Broadcast	**0.0.0.0/8**
Loopback	**127.0.0.0/8**
Multicast	**224.0.0.0/4**
Limited Broadcast	**255.255.255.255/32**

"A router SHOULD NOT forward any packet that has an invalid IP source address"

RFC1812 - Requirements for IP Version 4 Routers – Section 5.3.7 Martian Address Filtering

Exclude Private Addresses

"The Internet Assigned Numbers Authority (IANA) has reserved the following three blocks of the IP address space for private internets:

10.0.0.0 - 10.255.255.255 (10/8 prefix)
172.16.0.0 - 172.31.255.255 (172.16/12 prefix)
192.168.0.0 - 192.168.255.255 (192.168/16 prefix)"

RFC1918 - Address Allocation for Private Internets

Solution to the Korean Spam problem?

```
# ENGLISH

IP Address          : 172.21.3.168-172.21.3.199
Connect ISP Name    : DREAMX
Connect Date        : 20000622
Registration Date   : 20000706
Network Name        : DSB

[ Organization Information ]
Orgnization ID      : ORG127773
Name                : DSB
State               : PUSAN
Address             : Billra Dangrishinik 407 Dangri-Dong
Zip Code            : 604-010

[ Admin Contact Information]
Name                : YOUNGKIL SHIN
Org Name            : DREAMX
State               : SEOUL
Address             : 12F World Tower 7-25 Shincheon-Dong Songpa-Gu
Zip Code            : 138-240
Phone               : +82-2-3434-1790
Fax                 : +82-2-3434-1799
E-Mail              : ykshin@cjdream.net

[ Technical Contact Information ]
Name                : SUKBONG KIM
Org Name            : DREAMX
State               : SEOUL
Address             : 12F World Tower 7-25 Shincheon-Dong Songpa-Gu
Zip Code            : 138-240
Phone               : +82-2-3434-1768
Fax                 : +82-2-3434-1799
E-Mail              : sbkim091@dreamx.net
```

Exclude IANA Addresses*

RESERVED-9	1.0.0.0 - 1.255.255.255
RESERVED-2	2.0.0.0 - 2.255.255.255
PDN	14.0.0.0 - 14.255.255.255
RESERVED-23	23.0.0.0 - 23.255.255.255
RESERVED-31	31.0.0.0 - 31.255.255.255
RESERVED-37	37.0.0.0 - 37.255.255.255
RESERVED-39A	39.0.0.0 - 39.255.255.255
RESERVED-41A	41.0.0.0 - 41.255.255.255
RESERVED-58	58.0.0.0 - 58.255.255.255
RESERVED-59	59.0.0.0 - 59.255.255.255
RESERVED-60	60.0.0.0 - 60.255.255.255
RESERVED-7	69.0.0.0 - 79.255.255.255
RESERVED-11	82.0.0.0 - 95.255.255.255
RESERVED-8	96.0.0.0 - 126.255.255.255

*Note: This information is subject to change.
Looking up 'IANA' at ARIN.net will give you the current list.

Source IP Validation
IANA Addresses contd…

RESERVED-3	128.0.0.0 - 128.0.255.255
BLACKHOLE.ISI.EDU	128.9.64.26
TEST-B	128.66.0.0 - 128.66.255.255
LINKLOCAL	169.254.0.0 - 169.254.255.255
RESERVED	191.255.0.0 - 191.255.255.255
RESERVED-192	192.0.0.0 - 192.0.127.255
ROOT-NS-LAB	192.0.0.0 - 192.0.0.255
NET-ROOTS-NS-LIVE	192.0.1.0 - 192.0.1.255
NET-TEST	192.0.2.0 - 192.0.2.255
RESERVED-2A	192.0.128.0 - 192.0.255.255
RESERVED-2-A	192.0.128.0 - 192.0.255.255
IANA-192	192.88.99.0 - 192.88.99.255
RESERVED-13	197.0.0.0 - 197.255.255.255
RESERVED-14	201.0.0.0 - 201.255.255.255
RESERVED	221.0.0.0 - 223.255.255.255

Note possibly contrived bogus IPs

improbable octet sequences

- 1.2.3.4
- 5.6.7.8

nmap decoy addresses

- 24.24.24.24
- 23.23.23.23

Perform Spoof Detection

"The weakness in this scheme [the Internet Protocol] is that the source host itself fills in the IP source host id, and there is no provision in … TCP to discover the true origin of the packet."

Robert T. Morris writing about IP in his 1985 paper "A Weakness in the 4.2BSD Unix† TCP/IP Software"

Traceroute Hop Count

Step 1: Calculate the *implied* hop count from the packet you received. The *implied* hop count is:

Original packet TTL - Final TTL (where you received it)
(Note that you must guess what the original TTL value is.)

Step 2: Traceroute to the IP and get an *actual* hop count. If substantially different from the implied count, then the IP may be spoofed

Default TTL Values

OS Version	tcp_ttl	udp_ttl
AIX	60	30
FreeBSD 2.1R	64	64
HP/UX 9.0x	30	30
HP/UX10.01	64	64
Irix 5.3	60	60
Irix 6.x	60	60
Linux	64	64
MacOS/MacTCP 2.0.x	60	60
OS/2 TCP/IP 3.0	64	64
OSF/1 V3.2A	60	30
Solaris 2.x	255	255
SunOS 4.1.3/4.1.4	60	60
MS Windows 95	32	32
MS Windows NT 3.51	32	32
MS Windows NT 4.0	128	128

Example Example Example Example Example

Source IP Validation
Spoof Detection

Traceroute Hop Count Difficulties

```
Type escape sequence to abort.
Tracing the route to forthelife.net (216.144.196.7)

 1 63.237.160.113 8 msec 12 msec 8 msec
 2 lax-core-01.inet.qwest.net (205.171.19.149) 8 msec 8 msec 8 msec
 3 sjo-core-03.inet.qwest.net (205.171.5.155) 16 msec 16 msec 16 msec
 4 sjo-core-01.inet.qwest.net (205.171.22.10) 16 msec 16 msec 16 msec
 5 sfo-core-02.inet.qwest.net (205.171.5.131) 20 msec 48 msec 16 msec
 6 chi-core-01.inet.qwest.net (205.171.5.42) 72 msec 64 msec 68 msec
 7 chi-core-03.inet.qwest.net (205.171.20.174) 64 msec 64 msec 76 msec
 8 chi-edge-17.inet.qwest.net (205.171.20.154) 64 msec 64 msec 68 msec
 9 63.149.1.70 80 msec 84 msec 84 msec
10 10.60.1.9 80 msec *  80 msec
11 172.16.250.1 96 msec 84 msec 88 msec
12  *  *  *
13  *  *  *
```

Example Example Example Example Example

Perform Route Validation

A Looking Glass site allows you to access the routing table on a core router. Using this you can determine if any routes exist to the IP address you are interested in.

http://lg.above.net/
http://nitrous.digex.net/cgi-bin/looking_glass.pl
http://www.merit.edu/~ipma/tools/lookingglass.html

Spoof Example

```
No match for "182.1.1.2".

%%%%%%%%%%%%%%%%%%%% NO MATCH TIP %%%%%%%%%%%%%%%%%%%%%%%%%%
%                                                          %
%  ALL OF THE POINT OF CONTACT HANDLES IN THE ARIN         %
%  WHOIS END WITH "-ARIN", IF YOU ARE QUERYING A POINT     %
%  OF CONTACT HANDLE PLEASE ADD -ARIN TO YOUR QUERY.       %
%                                                          %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%


The ARIN Registration Services Host contains ONLY Internet
Network Information: Networks, ASN's, and related POC's.
Please use the whois server at rs.internic.net for DOMAIN related
Information and whois.nic.mil for NIPRNET Information.
```

Source IP Validation
Spoof Example contd…

allegianceinternet

MAE-West Looking Glass Results

Query: bgp
Addr: 182.1.1.2

```
% Network not in table
```

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Tame Backtrace

Nslookup

Performing a reverse DNS lookup with nslookup can sometimes yield the domain name of the IP address in question. Armed with that domain name, we can query for the domain's Start of Authority (SOA) contact information.

Nslookup Example

```
D:\>nslookup
> set type=ptr
> 26.22.209.24.in-addr.arpa
Server:  huey.cbeyond.net
Address:  64.213.152.18

Non-authoritative answer:
26.22.209.24.in-addr.arpa
name = dhcp024-209-022-026.cinci.rr.com

> set type=soa
> 26.22.209.24.in-addr.arpa
Server:  huey.cbeyond.net
Address:  64.213.152.18

*** No start of authority (SOA) records available for
26.22.209.24.in-addr.arpa
```

Tame Backtrace
Nslookup Example contd…

```
> 22.209.24.in-addr.arpa
Server:  huey.cbeyond.net
Address:  64.213.152.18

Non-authoritative answer:
22.209.24.in-addr.arpa
        primary name server = ns1.columbus.rr.com
        responsible mail addr = noc.columbus.rr.com
        serial  = 2000120401
        refresh = 3600 (1 hour)
        retry   = 900 (15 mins)
        expire  = 604800 (7 days)
        default TTL = 3880 (1 hour 4 mins 40 secs)
```

whois (IP)

If a reverse DNS query on the IP address fails to turn up any results, the next place to look is in the ARIN whois registry. This can be accessed via HTTP, a whois client, or raw, via port 43.

- **If the domain portion of the whois email contact seems to be associated with the organization owning the netblock, then take that as the responsible domain**

- **Do NOT use the contact mailbox for security issues unless it is a very small netblock (class C or less)**

ARIN Whois Query Syntax

To find only a certain **TYPE** of record, use keyword:

HOst
ASn
PErson
ORganization
NEtwork
GRoup

To search only a specific **FIELD**, use keyword or character:

HAndle or "!"
Mailbox or contains "@"
NAme or leading "."

Here are some additional Whois keywords:

EXPand or "*"	Shows all parts of display without asking
Full or "="	Shows detailed display for EACH match
Help	Enters the help program for full documentation
PArtial or trailing "."	Matches targets STARTING with the given string
Q, QUIT, or Return	Exits Whois
SUBdisplay or "%"	Shows users of host, hosts on net, etc.
SUMmary or "$"	Always shows summary, even if just one match

Nice contact info here...

```
Internet America (NETBLK-IADFW-BLK3)
   350 N St. Paul Suite 200
   Dallas TX 75201
   US

   Netname: IADFW-BLK3
   Netblock: 207.136.0.0 - 207.136.63.255
   Maintainer: IAM

Coordinator:
   Wommack, Mike  (MW781-ARIN)  m_wommack@hotmail.com
   123-456-7890 (FAX) 123-456-7890

Domain System inverse mapping provided by:

NS1.IADFW.NET206.66.12.36
NS2.IADFW.NET204.178.72.30

Record last updated on 27-Dec-1996.
Database last updated on 19-Jun-2001 23:00:59 EDT.
```

Intermediate Backtrace

Recursive whois (IP)

Records that are not administered by ARIN are likely to be found at one of the other regional registries, RIPE and APNIC. Sometimes a query to ARIN will refer you to APNIC who, in turn, will direct you to JPNIC, KRNIC, or or one of the national registries.

whois (domain)

Cross-check the domain info returned from a IP based whois query with the domain whois records. Geektools runs a nice proxy that can be used for both IP and domain name queries.

The State of .us

"Under current administrative practices, the usTLD not only has no central database that can in turn create a central Whois, there is also no mechanism in place for delegees to provision database information to the central registry. Even if delegees wished to provide new Whois information to the usTLD administrator, that capability is currently nonexistent."

"NeuStar Response to SB1335- 01-Q- 0740" Part of NeuStar's proposal for managing the .us TLD

Mailbox validation

You can use nslookup to get the mail server for a domain, and then manually you can VRFY addresses at the domain. If verification is turned off, you may want to check http://whois.abuse.net

NETWORK **ABUSE** CLEARINGHOUSE

Look up an address in the abuse.net contact database

Database updated July 5, 2002 18:15, current size 107666 entries.

Enter the name of the domain that you would like to check, such as `example.com`.

Lookup

Look up another domain

Return to the abuse.net home page.

This page updated: 04/03/2002

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Advanced Backtrace

Web Search

If a whois query doesn't give you the appropriate domain, try a Google search on organization name adding *parts* of the address info

Double Netblocks?

```
Search results for: 205.235.9.204

I-Wave Corp. (NETBLK-NET-IWAVE-HUB) NET-IWAVE-HUB     205.235.0.0 - 205.235.15.255
Cyberholdings Incorporated (NETBLK-CYBERHOLDINGS) CYBERHOLDINGS
                                                      205.235.0.0 - 205.235.15.255
```

Advanced Backtrace
Double Netblocks? contd…

```
I-Wave Corp. (NETBLK-NET-IWAVE-HUB)
   800 Towers Crescent Dr, ste 1350
   Vienna, VA  22182
   US

   Netname: NET-IWAVE-HUB
   Netblock: 205.235.0.0 - 205.235.15.255
   Maintainer: WAVE

   Coordinator:
      Rosenbaum, Alex  (AR143-ARIN)  alexrosenbaum@hotmail.com
      (240) 462-8655

   Domain System inverse mapping provided by:

   DNS1.HOY.NET205.235.2.130
   NS2.CW.NET204.70.57.242
   Record last updated on 10-Oct-1997.
   Database last updated on  21-Mar-2002 19:58:27 EDT.
```

Advanced Backtrace
Double Netblocks? contd…

Advanced Search Preferences Language Tools Search Tips

Google™ iwave Vienna VA Google Search

Web Images Groups Directory

Searched the web for **iwave Vienna VA**. Results **1** - **10** of about **21**. Search took **0.10** seconds.

Tip: Use Google to find street maps! Just enter a street address with city/state or zip (e.g. 165 University Ave Palo Alto CA) into the search box.

ebizQ.net: The Portal for e-Business Integration
... Understanding Enterprise Messaging and Standards-based Integration: A Technical Seminar by Sonic Software, 2002-06-13, **Vienna**, **VA**. **...**
www.ebizq.net/ - 43k - Cached - Similar pages

Message Q - News
... News Search by Category. **...**
www.ebizq.net/news/ - 45k - Cached - Similar pages

Netplex Internet Access Providers
... i-Wave address: 8000 Tower Crescent Dr., Suite 1350, **Vienna**, **VA** 22182: Web site: http://www.**iwave**.com; e-mail: auto-responder: info@**iwave**.com; voice: (703) 760 **...**
www.cris.com/~raydaly/plexacce.html - 26k - Cached - Similar pages

Newsletter 2000-03
... and have not received a confirmation e-mail, please send e-mail to **iwave** **...** YTEC2000 Organization Committee KSEA 1952 Gallows Road, Suite 300, **Vienna**, **VA** **...**
www.public.asu.edu/~smlee/KASA/newsletter/0003.html - 14k - Cached - Similar pages

Message Q - News

Advanced Backtrace
Double Netblocks? contd…

Rwhois

“RWhois (Referral Whois) extends and enhances the Whois concept in a hierarchical and scaleable fashion. In accordance with this, RWhois focuses primarily on the distribution of "network objects", or the data representing Internet resources or people, and uses the inherently hierarchical nature of these network objects (domain names, Internet Protocol (IP) networks, email addresses) to more accurately discover the requested information.”

RFC2167 - Referral Whois (RWhois) Protocol V1.5

Rwhois Example

```
Rwhois server data:

%rwhois V-1.5:001ab7:00 rwhois.exodus.net (Exodus Communications)
network:Class-Name:network
network:Auth-Area:0.0.0.0/0
network:Network-Name:216.34.168.128
network:IP-Network:216.34.168.128/26
network:Organization;I:Pixel Magic Imaging
network:Name;I:Alfred Grant Lewis
network:Email;I:glewis@pmimaging.com
network:Street;I:631 Mill Street
network:City;I:San Marcos
network:State;I:TX
network:Postal-Code;I:78666
network:Country-Code;I:USA

network:Class-Name:network
network:Auth-Area:0.0.0.0/0
network:Network-Name:216.34.160.0
network:IP-Network:216.34.160.0/20
network:Organization;I:Exodus IDC - AU/AU1
network:Name;I:Exodus IP Address Administrator
network:Email;I:ipaddressadmin@exodus.net
network:Street;I:1418 Park Center Drive
Building 1
network:City;I:Austin
network:State;I:TX
network:Postal-Code;I:78753
network:Country-Code;I:USA

network:Class-Name:network
network:Auth-Area:0.0.0.0/0
network:Network-Name:216.32.0.0
network:IP-Network:216.32.0.0/14
network:Organization;I:Exodus Communications (Exodus Legacy)
network:Name;I:Exodus Hostmaster
network:Phone;I:888-239-6387
network:Email;I:ipaddressadmin@exodus.net
network:Street;I:2831 Mission College Boulevard
network:City;I:Santa Clara
```

Advanced Backtrace
Rwhois Example contd…

```
Registrant:
David Oles (PMIMAGING2-DOM)
   631 Mill Street
   San Marcos, TX 78666
   US

   Domain Name: PMIMAGING.COM

Administrative Contact, Technical Contact:
   Melancon, Mark  (ILLYVXOEGO)hostmaster@PMIMAGING.COM
   Pixel Magic Imagin/IT Manager
   631 Mill Street
   San Marcos , TX 78666
   US
   512 396 7251
   Fax- 512 396 8767
```

Routing Registry (RR Records)

Internet routing registries, as described in the Routing Policy Specification Language, RPSL (RFC2280) document, provides a view of the global routing policy to improve the integrity of the Internet's routing.

Success with RR

```
Click Network/Local Access (NETBLK-GBX-REQ000000014080)
   1111  Altheimer Street South
   Tacoma, WA 98402
   US

   Netname: GBX-REQ000000014080
   Netblock: 208.51.248.0 - 208.51.251.255

   Coordinator:
      Global Crossing  (IA12-ORG-ARIN)  ipadmin@gblx.net
      +1 800 404-7714

   Record last updated on 29-Nov-2001.
   Database last updated on  28-Apr-2002 19:58:33 EDT.

The ARIN Registration Services Host contains ONLY Internet
Network Information: Networks, ASN's, and related POC's.
Please use the whois server at rs.internic.net for DOMAIN related
Information and whois.nic.mil for NIPRNET Information.
```

Advanced Backtrace
Success with RR contd…

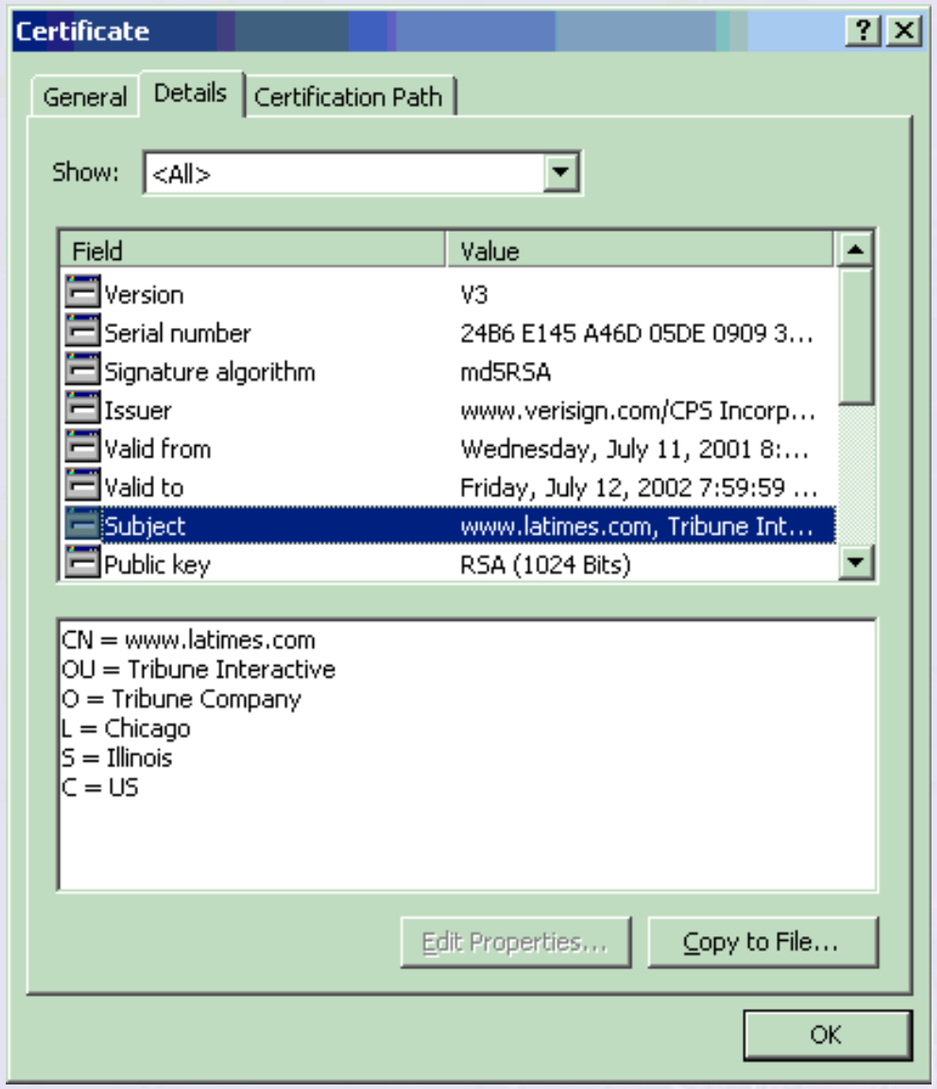
```
% ARIN Internet Routing Registry Whois Interface

route:          208.51.251.0/24
descr:          Customer Local Access
origin:         AS20394
notify:         hostmaster@click-network.com
mnt-by:         MAINT-AS14677
changed:        sroberts@click-network.com 20020110
source:         RADB

route:          208.48.0.0/14
descr:          GBLX-US-AGGREGATE
origin:         AS3549
mnt-by:         GBLX-RIPE-MNT
changed:        dcooper@globalcenter.net 19991229
source:         RIPE
```

Extreme Backtrace

Mail Banner?

Telnet to port 25 and see if the IP address runs a mailserver and has possibly published a useful banner. Other well known ports may be tried as well (POP, FTP, etc.)

Contact information gleaned from SSL Cert.



Gone too far?

```
% This is the RIPE Whois server.
% The objects are in RPSL format.
% Please visit http://www.ripe.net/rpsl for more information.
% Rights restricted by copyright.
% See http://www.ripe.net/ripencc/pub-services/db/copyright.html

inetnum:        62.36.225.184 - 62.36.225.187
netname:        EMSERTEX
descr:          Red de EMSERTEX
descr:          Spain
country:        ES
admin-c:        EDMO-RIPE
tech-c:         REPR-RIPE
status:         ASSIGNED PA
mnt-by:         UNI2-MNT
changed:        emorenoz@uni2.es 20020419
source:         RIPE

route:          62.36.0.0/16
descr:          Uni2 PA Block 1
origin:         AS12479
mnt-by:         UNI2-MNT
changed:        ntalayero@uni2.es 19990806
```

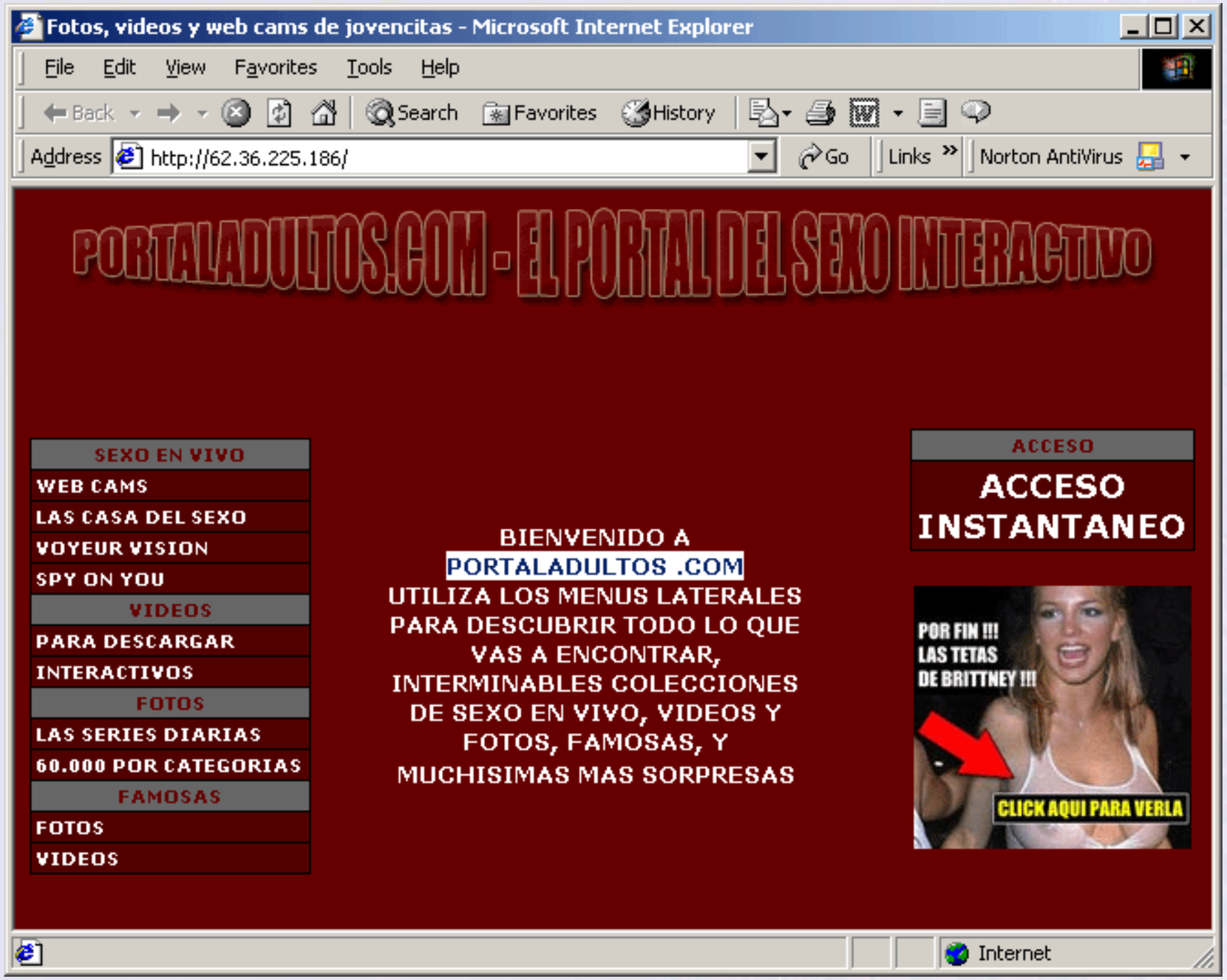
Example Example Example Example Example

Extreme Backtrace
Gone too far? contd…

```
ftp> open 62.36.225.185
Connected to 62.36.225.185.

220 m3hdesmertex FTP server (Version wu-2.6.0(1)
Mon Feb 28 10:30:36 EST 2000) ready.
User (62.36.225.185:(none)):
```

Example Example Example Example Example

Extreme Backtrace
Gone too far? contd…



Extreme Backtrace
Gone too far? contd…

```
Registrant:
   Acosta Gestion S.L.
   C/Severo Ochoa
   Madrid, Madrid 28230
   ES

   Domain Name: PORTALADULTOS.COM

   Administrative Contact, Technical Contact, Zone Contact:
      Acosta Gestion S.L.
      Esteban Acosta
      Calle Dr. Madrid 1
      Madrid, Madrid 28220
      ES
      011916340101
      webmaster@portaladultos.com

   Domain created on 21-May-2001
   Domain expires on 21-May-2003
   Last updated on 29-Apr-2002

   Domain servers in listed order:
   DNS.COMTENIDOS.COM           62.37.225.56
   DNS2.COMTENIDOS.COM          62.37.225.57
```

Still no answer?

Still no answer?

Identify responsible AS

Lookup IP in BGP route tables to identify which Autonomous System is responsible for the route. Then, identify the responsible domain by doing recursive Whois AS lookups.

The Quality of AS data

allegianceinternet

MAE-East Looking Glass Results

Query: bgp
Addr: 205.152.0.20

```
BGP routing table entry for 205.152.0.0/20, version 27329330
Paths: (3 available, best #2)
  Advertised to peer-groups:
    rr-pop
  701 6197
    165.117.68.190 (metric 105100) from 165.117.1.160 (165.117.1.147)
      Origin IGP, metric 6, localpref 100, valid, internal
      Community: 2548:180 2548:254 2548:666 3706:102
      Originator: 165.117.1.147, Cluster list: 165.117.1.160, 165.117.161.7, 165.117.162.202, 165.11
  701 6197
    165.117.68.190 (metric 105100) from 165.117.1.52 (165.117.1.147)
      Origin IGP, metric 6, localpref 100, valid, internal, best
      Community: 2548:180 2548:254 2548:666 3706:102
      Originator: 165.117.1.147, Cluster list: 165.117.1.52, 165.117.162.200, 165.117.162.202, 165.1
  701 6197
    165.117.68.190 (metric 105100) from 165.117.1.147 (165.117.1.147)
      Origin IGP, metric 4294967294, localpref 100, valid, internal
      Community: 2548:180 2548:254 2548:666 3706:102
```

Advanced Backtrace
The Quality of AS data contd…

Output from ARIN Whois

ARIN Home Page | ARIN Site Map | ARIN Whois Help | **NEW!** Database & Template Conversion Information Center

Search for : Submit

Search results for: AS 6197

```
BellSouth Network Solutions, Inc (ASN-BATI-ATL)
   1100 Ashwood Parkway, Suite 200
   Atlanta, Ga. 30338
   US

   Autonomous System Name: BATI-ATL
   Autonomous System Number: 6197

   Coordinator:
      Dawson, Willard  (WD14-ARIN)  willard.dawson@SBS.SIEMENS.COM
      770 814 5099 (FAX) 770 814 5280

   Record last updated on 04-Jan-1996.
   Database last updated on  8-Jul-2002 20:01:39 EDT.
```

Advanced Backtrace
The Quality of AS data contd…

Output from ARIN Whois

ARIN Home Page ARIN Site Map ARIN Whois Help **NEW!** Database & Template Conversion Information Center

---

Search for : [ ] Submit

Search results for: WD14-ARIN

```
Dawson, Willard (WD14-ARIN)                    willard.dawson@SBS.SIEMENS.COM
   Siemens Business Services
   Siemens Business Services
   4570 River Green Parkway, Suite 140
   Duluth, GA 30096-2564
   770 814 5099 (FAX) 770 814 5280

   Record last updated on 13-Nov-1997.
   Database last updated on  8-Jul-2002 20:01:39 EDT.
```

Still no answer?

Netbios enabled?

See if IP has Netbios enabled and can receive a Winpopup message

Example (From DOS)
C:\> **nbtstat -A 24.24.24.24**

If you get a response, then:
C:\> **net send 24.24.24.24 "FYI, You've been hacked, ... instructions ..."**

Still no answer?

Netbios Backtrace

```
D:\gdtest>nbtstat -A 208.254.151.185

Local Area Connection:
Node IpAddress: [172.16.1.169] Scope Id: []

            NetBIOS Remote Machine Name Table

   Name               Type         Status
---------------------------------------------
HLM             <00>  UNIQUE       Registered
ADDUCCI_DORF    <00>  GROUP        Registered
HLM             <03>  UNIQUE       Registered
HLM             <20>  UNIQUE       Registered
ADDUCCI_DORF    <1E>  GROUP        Registered

MAC Address = 00-50-8B-6A-32-63
```

Still no answer?
Netbios Backtrace Contd…

```
D:\>tracert 208.254.151.185

Tracing route to HLM [208.254.151.185]
over a maximum of 30 hops:

  1    10 ms   <10 ms   <10 ms  host121.mynetwatchman.com [64.238.113.121]
  2   <10 ms   <10 ms    10 ms  172.16.41.165
  3   <10 ms    10 ms   <10 ms  car00-s6-0-1.atlagabu.cbeyond.net [192.168.14.17]
  4   <10 ms    10 ms   <10 ms  bgr00-g2-0.atlagabu.cbeyond.net [192.168.18.49]
  5   <10 ms    10 ms    10 ms  s1-0-0.ar1.ATL1.gblx.net [64.211.166.201]
  6   <10 ms    10 ms    10 ms  pos2-0-155M.cr1.ATL1.gblx.net [206.132.115.113]
  7   <10 ms    10 ms    10 ms  pos0-0-0-155M.br1.ATL1.gblx.net [206.132.115.118]
  8   <10 ms    10 ms    10 ms  57.ATM2-0.BR1.ATL5.ALTER.NET [204.255.168.137]
  9   <10 ms    10 ms    10 ms  0.so-2-3-0.XL2.ATL5.ALTER.NET [152.63.82.194]
 10   <10 ms    10 ms    10 ms  0.so-1-2-0.TL2.ATL5.ALTER.NET [152.63.146.2]
 11    40 ms    31 ms    40 ms  0.so-6-0-2.TL2.CHI4.ALTER.NET [152.63.13.45]
 12    40 ms    40 ms    40 ms  0.so-0-0-0.XL2.CHI4.ALTER.NET [152.63.13.33]
 13    30 ms    40 ms    40 ms  0.so-4-0-0.XR2.CHI4.ALTER.NET [152.63.2.58]
 14    40 ms    40 ms    40 ms  194.ATM7-0.GW4.CHI1.ALTER.NET [152.63.68.229]
 15    50 ms    40 ms    50 ms  HLM [208.254.151.185]

Trace complete.
```

Still no answer?
Netbios Backtrace Contd…

Google™ Advanced Search Preferences Language Tools Search Tips

+dorf +adducci Google Search

Web Images Groups Directory

Searched the web for **+dorf +adducci**. Results **1** - **10** of about **26**. Search took **0.06** seconds.

2 "Astronomical Figures," University of Chicago Magazine, ...
... Dorf, a partner in the general-practice law firm **Adducci**, **Dorf**, Lehner, Mitchell & Blankenship, PC, in Chicago, is writing a musical based on Yerkes' life. **...**
www2.uchicago.edu/alumni/alumni.mag/ 9702/9702Yerkes6.html - 6k - Cached - Similar pages

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... 312/565-0832. Michael C. **Dorf Adducci Dorf** et al Ste 2130 150 N. Michigan Ave. Chicago IL 60601 312/781-2806 312/781-2811. Karen M **...**
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File Format: PDF/Adobe Acrobat - View as HTML
... West Phoenix, Arizona Michael **Dorf**, Attorney Michael **Dorf**, Attorney Michael **Dorf**, Attorney Michael **Dorf**, Attorney Michael **Dorf**, Attorney **Adducci**, **Dorf**, Lehner **...**
www.westaf.org/proceedings/summary2000.pdf - Similar pages

Chicago law firm web pages
... A. Abderholden & Traunfeld, PC Abrahamson, Vorachek & Mikva **Adducci**, **Dorf**, Lehner, Mitchell & Blankenship, PC Alholm, Monahan, Keefe & Klauke Altheimer & Gray **...**
www.kentlaw.edu/depts/cso/handout_Chicagofirmweb.html - 32k - Cached - Similar pages

Example Example Example Example Example

Still no answer?
Netbios Backtrace Contd…

Example Example Example Example Example

Still no answer?
Netbios Backtrce Contd…

```
Registrant:
Adducci,Dorf,Lehner,Mitchell & Blankenship (ADLMB-DOM)
   150 N. Michigan Ave, Suite 2130
   Chicago, IL 60601
   US

   Domain Name: ADLMB.COM

   Administrative Contact:
      Blankenship, Martin  (MBM810)mblankenship@ADLMB.COM
      Adducci,Dorf,Lehner,Mitchell & Blankenship
      150 N. Michigan Ave, Suite 2130
      Chicago , IL 60601
      312.781.2800 (FAX) 312.781.7811
   Technical Contact:
      eLink Support  (ES786-ORG)support@ELINKDC.COM
      eLink Communications
      6708 Wisconsin Avenue
      Bethesda, MD 20815
      US
      240-744-1300
      Fax- 240-744-1320

   Record expires on 11-Dec-2002.
   Record created on 11-Dec-2000.
   Database last updated on 10-Jul-2002 21:21:15 EDT
```

If all else fails...

Punt!

Move 1 hop upstream as indicated by a traceroute and then repeat the whole backtracing process until you find a provider.

Get as close as possible

```
% This is the RIPE Whois server.
% The objects are in RPSL format.
% Please visit http://www.ripe.net/rpsl for more information.
% Rights restricted by copyright.
% See http://www.ripe.net/ripencc/pub-services/db/copyright.html

inetnum:        62.220.108.0 - 62.220.111.255
netname:        Intercompro
descr:          Intercompro Communication Provider
country:        IR
admin-c:        HS400-RIPE
tech-c:         HE81-RIPE
status:         ASSIGNED PA
notify:         registry@takta.net
mnt-by:         TKT-MNT
mnt-lower:      TKT-MNT
mnt-routes:     TKT-MNT
changed:        akbarshahi@takta.net 20011206
source:         RIPE

route:          62.220.96.0/19
descr:          Takta-Net
origin:         AS21341
mnt-by:         TKT-MNT
changed:        akbarshahi@takta.net 20020107
…
```

Get as close as possible contd…

```
C:\nslookup
> set type=mx
> intercompro.net

*** No mail exchange (MX) records available for intercompro.net
> set type=a
> intercompro.net

*** No address (A) records available for intercompro.net
>
```

Get as close as possible contd…

```
Tracing route to 62.220.111.241 over a maximum of 30 hops

  1    <10 ms    <10 ms     10 ms  host121.mynetwatchman.com [64.238.113.121]
  2    <10 ms    <10 ms     10 ms  172.16.41.165
  3    <10 ms     10 ms    <10 ms  car00-s6-0-1.atlagabu.cbeyond.net [192.168.14.17]
  4    <10 ms     10 ms    <10 ms  bgr00-g2-0.atlagabu.cbeyond.net [192.168.18.49]
  5    <10 ms     10 ms    <10 ms  s1-0-0.ar1.ATL1.gblx.net [64.211.166.201]
  6    <10 ms     10 ms     10 ms  pos2-0-155M.cr2.ATL1.gblx.net [206.132.115.121]
  7     30 ms     30 ms     20 ms  pos1-0-622M.cr2.NYC2.gblx.net [206.132.249.170]
  8     20 ms     30 ms     20 ms  pos1-0-2488M.br2.NYC2.gblx.net [208.48.234.214]
  9     20 ms     30 ms     20 ms  ftna.br2.NYC2.gblx.net [208.51.134.22]
 10     20 ms     30 ms     20 ms  P10-0.NYKCR3.NY.opentransit.net [193.251.241.245]
 11     20 ms     30 ms     20 ms  P11-0.NYKCR2.NY.opentransit.net [193.251.241.217]
 12    100 ms    101 ms    100 ms  P4-0.PASCR1.Pstrl.opentransit.net [193.251.241.133]
 13    100 ms    100 ms    110 ms  P3-0.PASCR3.Pstrl.opentransit.net [193.251.241.126]
 14    100 ms    100 ms    110 ms  P9-0.PASBB1.Pstrl.opentransit.net [193.251.241.161]
 15    101 ms    100 ms    110 ms  P8-0-0.PASAR1.Pstrl.opentransit.net [193.251.128.70]
 16    100 ms    100 ms    101 ms  GlobeCastSerte.GW.opentransit.net [193.251.248.122]
 17    100 ms    100 ms    100 ms  10.30.0.14
 18    621 ms    631 ms    621 ms  62.220.96.125
 19    631 ms    631 ms    621 ms  62.220.96.2
 20    631 ms    620 ms    631 ms  62.220.100.7
 21    621 ms    621 ms    621 ms  62.220.101.131
 22    621 ms    631 ms    621 ms  62.220.111.241

Trace complete.
```

Get as close as possible contd...

```
% This is the RIPE Whois server.
% The objects are in RPSL format.
% Please visit http://www.ripe.net/rpsl for more information.
% Rights restricted by copyright.
% See http://www.ripe.net/ripencc/pub-services/db/copyright.html

inetnum:        62.220.96.0 - 62.220.107.255
netname:        TAKTA-NET
descr:          Takta Co. Access Service Provider
country:        IR
admin-c:        TR47-RIPE
tech-c:         TR47-RIPE
status:         ASSIGNED PA
mnt-by:         TKT-MNT
mnt-lower:      TKT-MNT
mnt-routes:     TKT-MNT
changed:        hostmaster@ripe.net 20011025
source:         RIPE

route:          62.220.96.0/19
descr:          Takta-Net
origin:         AS21341
mnt-by:         TKT-MNT
changed:        akbarshahi@takta.net 20020107
source:         RIPE
```

Conclusion

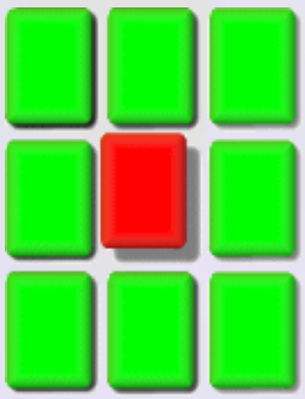
Are the calls coming from inside the house?

Unless you do Backtracing, you will never know the true source of an attack... or whether a packet was spoofed? However, even backtracing can't solve incorrect, non-existent, or just plain stale data present in some of the databases.

You <u>do</u> read your logs, right?

If not, consider having a service do it for you automatically, or use your own open-source tools to do it.

- **http://www.mynetwatchman.com**
- **http://www.dshield.org**
- **Swatch**
- **Logsentry**



References

"Avoiding future denial-of-service attacks" by Denise Pappalardo.
Posted on CNN.com February 23, 2000
http://www.cnn.com/2000/TECH/computing/02/23/isp.block.idg/index.html

Gan.ru. The Nuclear Regulatory Agency in Russia.
http://www.gan.ru
http://www.mynetwatchman.com/LID.asp?IID=4875813

RFC 1812
http://www.faqs.org/rfcs/rfc1812.html

RFC 1918
http://www.faqs.org/rfcs/rfc1918.html

Solution to the Korean Spam Problem Example
http://www.merit.edu/mail.archives/nanog/2002-04/msg00029.html
http://www.merit.edu/mail.archives/nanog/2002-04/msg00044.html

"A Weakness in the 4.2BSD Unix† TCP/IP Software" by Robert T. Morris
http://www.pdos.lcs.mit.edu/rtm/papers/117.pdf

"NMAP: Decoy Analysis" by Max Vision
http://www.whitehats.com/library/nmap/index.html

Default TTL values.
http://www.switch.ch/docs/ttl_default.html.
http://216.239.35.100/search?q=cache:ybcsLpJuwS0C:www.switch.ch/docs/ttl_default.html+NT+Default+TTL&hl=en&ie=UTF-8

Traceroute Hop Count Difficulties Example
http://www.merit.edu/mail.archives/nanog/2000-12/msg00143.html

Looking Glass Sites
http://lg.above.net/
http://nitrous.digex.net/cgi-bin/looking_glass.pl

Spoofed IP Example
http://www.mynetwatchman.com/LID.asp?IID=5415491

Nslookup Example
http://www.mynetwatchman.com/LID.asp?IID=5942546

Nice contact info here… Example
http://www.mynetwatchman.com/LID.asp?IID=5412503

Regional NICs
http://www.arin.net
http://www.apnic.net
http://www.ripe.net

Geektools whois proxy.
http://www.geektools.com

Operational ICANN Accredited Domain Registrars
http://www.internic.net/alpha.html

"NeuStar Response to SB1335- 01-Q- 0740"
http://www.ntia.doc.gov/ntiahome/domainname/usca/cafiles/SectionE.pdf

Abuse Net
http://www.abuse.net

Rwhois
http://www.rwhois.net/

Success with RR Example
http://www.mynetwatchman.com/LID.asp?IID=4171992

Gone Too Far? Example
http://www.mynetwatchman.com/LID.asp?IID=4162328

Netbios Backtrace Example
http://www.mynetwatchman.com/LID.asp?IID=6024235

Distributed IDSs
http://www.myNetWatchman.com
http://www.dshield.org

Appendix A:
ISP Anti-spoof Techniques

Ingress Filtering

"If an ISP is aggregating routing announcements for multiple downstream networks, strict traffic filtering should be used to prohibit traffic which claims to have originated from outside of these aggregated announcements."

RFC2267 - Network Ingress Filtering: Defeating Denial of Service Attacks which employ IP Source Address Spoofing

Input Debugging

Input Debugging allows an operator to filter particular packets on some egress port and determine which ingress port they arrived on. This reveals which upstream router originated the traffic.

The process is repeated recursively until the the ISP's border is reached. From there, the upstream ISP must be contacted to continue the trace.

Backscatter

Backscatter Technique - “BGP implementations on Cisco and Juniper routers (possibly others) allow you to arbitrarily set the 'next-hop' to any IP address. This quirk can be used to your benefit when tracking spoofed traffic. By setting particular prefixes to a known and specially handled 'next-hop', we can get some unique traffic tracking information off the network.”