



**“WHAT ARE YOUR EMPLOYEES DOING ON THE INTERNET?”**  
**“ARE YOUR CURRENT INTERNET TOOLS AND POLICIES WORKING?”**  
**“IS THERE ILLEGAL CONTENT ON YOUR STORAGE DEVICES?”**

**BAJAI Internet Forensic Services Group can provide you with a comprehensive analysis of your organization’s Internet activities and uncover illicit files.**

**BAJAI SCIENTISTS PROVIDE YOU WITH INSIGHTS**

- ❑ Network resource use or abuse, based on your Firewall Log files.
- ❑ Current Internet tools’ performance and failure rate.
- ❑ Areas of network resource use that require more attention.

**BAJAI – “Images, Everything”**

BAJAI’s proven technology can provide you with fast, cost effective and thorough analyses of your employees’ Internet activities and stored media files. The automation and speed of BAJAI’s intelligent systems replaces the costly manual labour required for categorizing potentially millions of firewall logs. Reports are managed by our scientists to ensure the scientific integrity of the studies. The methodologies used in these studies are well documented so that they may be duplicated and verified by any 3<sup>rd</sup> party.

**Internet Audit and Analysis Services Provided**

<p><b><u>Tier 1: Internet Log Audit</u></b>  <b>Analyze Internet Activity Logs</b>  <b>Audit Effectiveness of Current Tools and Policies</b></p>	<ul style="list-style-type: none"> <li>- Examine Internet activity patterns based on your Internet logs.</li> <li>- Categorize all web activities</li> <li>- Analysis of your current tools failure rate and shortcomings</li> </ul>	<p>HTTP, HTTPs, web mail, etc.            WebSense, SurfControl, self monitoring policies, etc.</p>
<p><b><u>Tier 2: Internet Activity Analysis</u></b>  <b>Analyze Content Categories</b></p>	<ul style="list-style-type: none"> <li>- Categorized based on BAJAI’s comprehensive list of web sites.</li> <li>- Trend Analysis of Choice Categories</li> </ul>	<p>Content Type, Bandwidth Used, Time of Day/Day of Week, etc.            Firewall Port Analysis, e.g. IRC, FTP, NNTP(Net news)</p>
<p><b><u>Tier 3: Comprehensive Analysis</u></b>  <b>Assess and Characterize Network Activity</b>  <b>Risk Assessment of Content and Activities</b>  <b>Review and Recommendations</b></p>	<ul style="list-style-type: none"> <li>- Highlight inappropriate uses of computing resources.</li> <li>- Assess the liability, security and productivity related issues.</li> <li>- Highlight missing checks and balances, and suggest remedies.</li> </ul>	<p>Adult/sex or Hate content, Activity by Day/Hour, etc.            Workplace harassment, security breeches, spyware, etc.            Internet usage policies, tools, etc.</p>



### **Forensic Analysis of Internet Activity Logs**

Our forensic analysis of Internet Content and Services accessed by your employees, through your organization's network, can highlight the amount of Internet activity that is not work related or which may pose security and/or liability risks. A forensic analysis will also reveal whether your current on-line activity management tools are performing as expected and whether your Internet policy directives are being followed.

Your organization provides Internet access, through your network, to your employees as a work place productivity tool. With your organization's security in mind, your network is structured so that all employee activity is channelled through common gateways or firewalls to the Internet. BAJAI's forensic analysis of online activities involves the processing, translation and subsequent classification of the millions of employee generated Internet requests that have been logged by your gateways, proxies and firewalls. BAJAI's iajaBot™ robotic farm automatically classifies content 24 hours a day, every day, utilizing OCULAR™ technology to continually create the most up-to-date and accurate web classification list available. BAJAI employs this technology to analyze and categorize over 1 million Internet log entries per hour.

### **Forensic Analysis of Media Storage Devices**

Our forensic analysis of Media Storage Devices can detect and retrieve electronic media that may be illegal or which violate your organization's policies for conduct. The iajaBot™ robots utilize OCULAR™ technology to quickly perform ON-THE-FLY image analysis. Pornography and illegal sexual material can be mathematically identified in all standard internet electronic image and video formats. Examples of Media Storage Devices are floppy disk, hard disk drives, CD-ROMs, and Storage Area Networks (SANs), i.e. any file structure formatted system which can store or transport electronic media files. Corporate email servers and suspect client email folders can be scanned for offensive email attachments. Law Enforcement Agencies or Human Resource departments can obtain authoritative evidence to proceed with remedial action, while sparing human investigators from the hours of searching, and the stress from viewing, illicit materials.

### **Internet Activity Statistics**

"Secret monitoring by the U.S. Treasury Department of Internet use among Internal Revenue Service employees found that activities such as personal e-mail, online chats, shopping and checking personal finances and stocks accounted for 51 percent of employees' time spent online. The top non-work Web activity favored by IRS employees was going to financial sites. Chat and email ran a close second, followed by miscellaneous activities (which included visiting adult sites), search requests, and looking at or downloading streaming media" - Chicago Tribune and Business 2.0

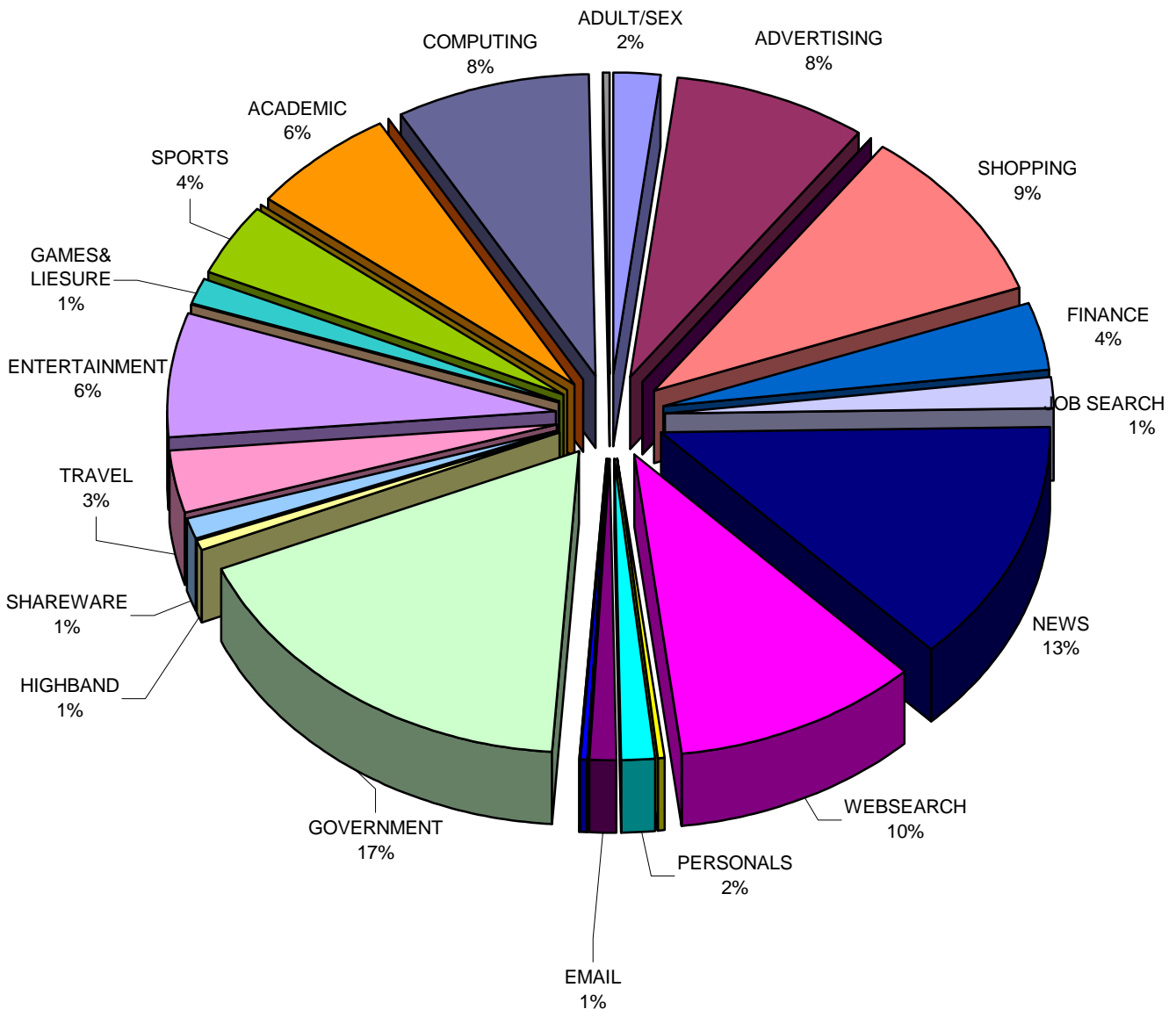
"US based Yankelovich partners, found that 62% of workers go online at work for personal reasons at least once a day, while about 20% do so 10 or more times a day. (19 July, 2000). " "Employer monitoring practices do not deter employees, as 71% say it is "somewhat likely" that a supervisor knows they are using the Internet for personal reasons. Half of those polled by Yankelovich believed their employer would not be held responsible for offensive materials distributed online by employees."

**Tier1 Report - Internet Log Audit**

- Includes:**
- Up to 24 Million Firewall logs broken down by Internet Category, Hits per Category, and Bandwidth per Category.
  - Evaluation of your current Web Activity Management tools
  - Price: \$1000CAN

**Sample Internet Activity Analysis - Over 24 Millions Logs**

**Figure 1 - Categorized Internet Activity**  
 (Categories less than 1% not displayed, see tables)

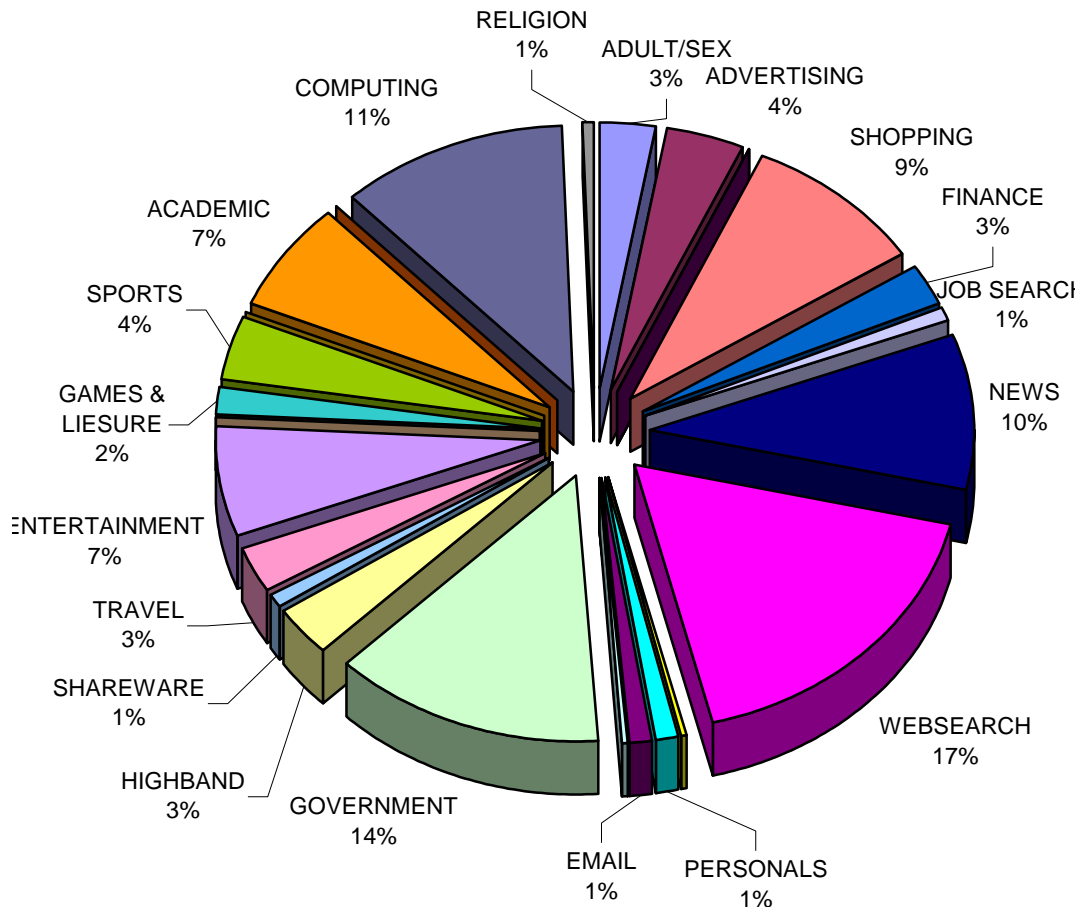


CATEGORY	HITS	BANDWIDTH (bytes)
ACADEMIC	1,327,559	8,091,375,769
ADULT/SEX	427,902	3,335,790,746
ADVERTISING	1,730,739	4,652,311,777
ALCOHOL/TOBACCO	6,614	35,141,993
COMPUTING	1,709,488	13,365,037,755
DRUGS	135	1,412,591
EMAIL	213,046	1,244,698,675
ENTERTAINMENT	1,406,181	7,732,912,922
FAMILYISSUES	40,406	321,295,983
FINANCE	815,562	2,979,817,629
GAMBLING	73,947	305,035,035
GAMES&LIESURE	312,845	1,816,190,185
GOVERNMENT	3,744,712	16,002,890,717
HACKING	242	16,424,277
HATE	209	2,270,785

CATEGORY	HITS	BANDWIDTH (bytes)
HIGHBAND	126,625	3,771,971,172
JOB SEARCH	301,015	999,643,535
NEWS	2,805,282	11,425,897,203
OCCULT/NEWAGE	29,794	151,701,317
PERSONALS	328,812	1,202,762,717
RELIGION	87,233	636,792,400
SHAREWARE	242,712	950,218,727
SHOPPING	2,011,757	10,592,562,104
SPORTS	807,539	4,635,532,461
TRAVEL	709,881	3,208,049,635
WEAPONS	8,552	61,293,552
WEBCAMS	10,375	59,676,781
WEBHOSTS	2,417,803	11,248,236,065
WEBRINGS	349	722,176
WEBSEARCH	2,219,962	20,617,352,089

**Table 1: Accesses and Bandwidth Use by Category**

**Figure 2 - Bandwidth Totals  
(Categories less than 1% not displayed, see tables)**



**Tier2 Report – Internet Activity Analysis**

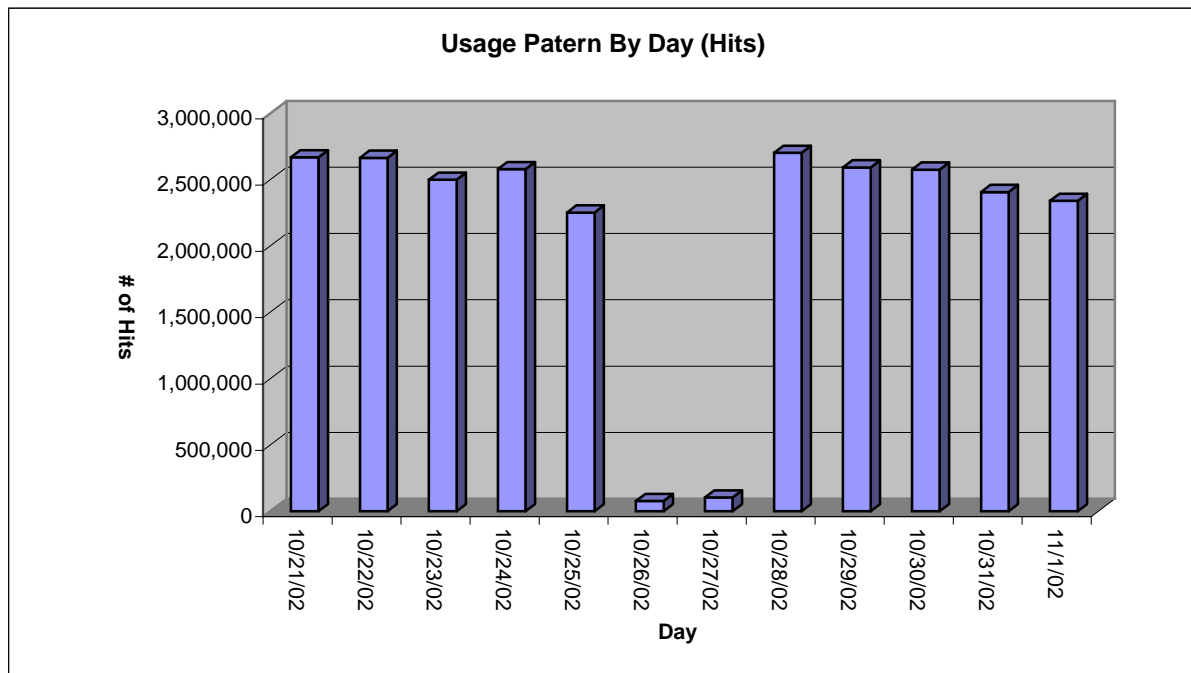
- Includes:**
- In Depth Analysis of **THREE** Internet Categories, additional Category optional. Example: Adult/Sexual, Gambling, Financial
  - Top **Five** URL's per Category
  - Trend Analysis of Firewall logs, broken down by Internet Category, Hits, and Bandwidth by Time/Date
  - Price: \$6000CAN for 3 categories, \$2000CAN each additional category

**Note** – If Tier1 purchased previously, subtract \$1000, for a total of **\$5000**

**Sample Internet Activity Analysis - Over 25 Millions Logs**

TIME	HITS	BANDWIDTH (bytes)	TIME	HITS	BANDWIDTH (bytes)
0:00	10,758	47,459,984	12:00	3,149,284	18,668,750,285
1:00	8,474	35,005,692	13:00	3,097,355	19,066,899,840
2:00	5,707	30,221,995	14:00	2,964,411	14,555,091,561
3:00	4,859	25,877,812	15:00	2,989,653	18,453,604,183
4:00	5,465	28,747,692	16:00	2,395,919	14,777,587,867
5:00	5,971	29,166,891	17:00	1,215,176	7,252,957,871
6:00	122,210	598,376,305	18:00	702,600	3,974,082,808
7:00	727,250	3,518,351,348	19:00	392,653	2,670,856,104
8:00	1,903,974	10,918,267,980	20:00	183,027	1,118,118,758
9:00	2,498,521	14,889,316,576	21:00	93,446	630,563,279
10:00	2,656,973	16,910,488,725	22:00	44,203	314,034,814
11:00	2,855,999	16,745,302,546	23:00	17,838	133,647,343

**Table 2: Accesses and Bandwidth Use by Hour for the entire reporting period**



**Figure 3: Graphical Representation of Usage Patterns**

### Sample Category Analysis - Adult/Sexual Content

This category contains URLs with adult oriented themes and activities. This includes sexual themes and erotic material, such a writings and pictures that show or describe sexual acts. Products targeted at an adult market and adult activities, including escorts, sex toys, strip clubs and mail-order-brides are other obvious examples. Explicit materials may be photos, drawings, videos, audio, textual or commercial goods such as sex toys. Sites or homepages that have self imposed or posted minimum age requirements of 18 or older are included in this category.

This category **DOES NOT CONTAIN** URLs that provide educational information about sex, sexual orientation, STDs (Sexually Transmitted Diseases), health care issues or other medical information!

Date	Hits	Bytes
Monday October 21	46,721	374,723,601
Tuesday October 22	37,740	253,018,237
Wednesday October 23	31,901	241,391,954
Thursday October 24	47,127	362,798,135
Friday October 25	48,988	437,301,799
Saturday October 26	1,739	28,189,419
Sunday October 27	1,703	21,753,226
Monday October 28	41,241	291,615,381
Tuesday October 29	35,579	266,981,231
Wednesday October 30	42,450	333,073,056
Thursday October 31	43,055	341,027,730
Friday November 01	49,658	383,916,977
<b>Totals</b>	<b>427,902</b>	<b>3,335,790,746</b>

*Table 3: Hits and Bandwidth Consumption*

Site	Number of Hits
adoublesens.com	15861
theonion.com	10906
www.babyhotfire.hpg.ig.com.br	8801
www.grownupfun.com	8094
www.bride.ru	7620

*Table 4: Top Five Hits for Category*

Site	Megabytes
www.todofamosas.net	71.10
theonion.com	66.86
cyber.playboy.com	54.30
www.dilio.com	49.75
www.babyhotfire.hpg.ig.com.br	49.14

*Table 5: Top Five Bandwidth Consumers*



Hourly Data (items)

Mon Dec 16 12:02:17 EST 2002

Boolean Searching: Mon Tue Wed Thu Fri Sat Sun AND From : 1 Oct, 2002 To: 16 Dec, 2002 AND 0 : 00 - 23 : 59

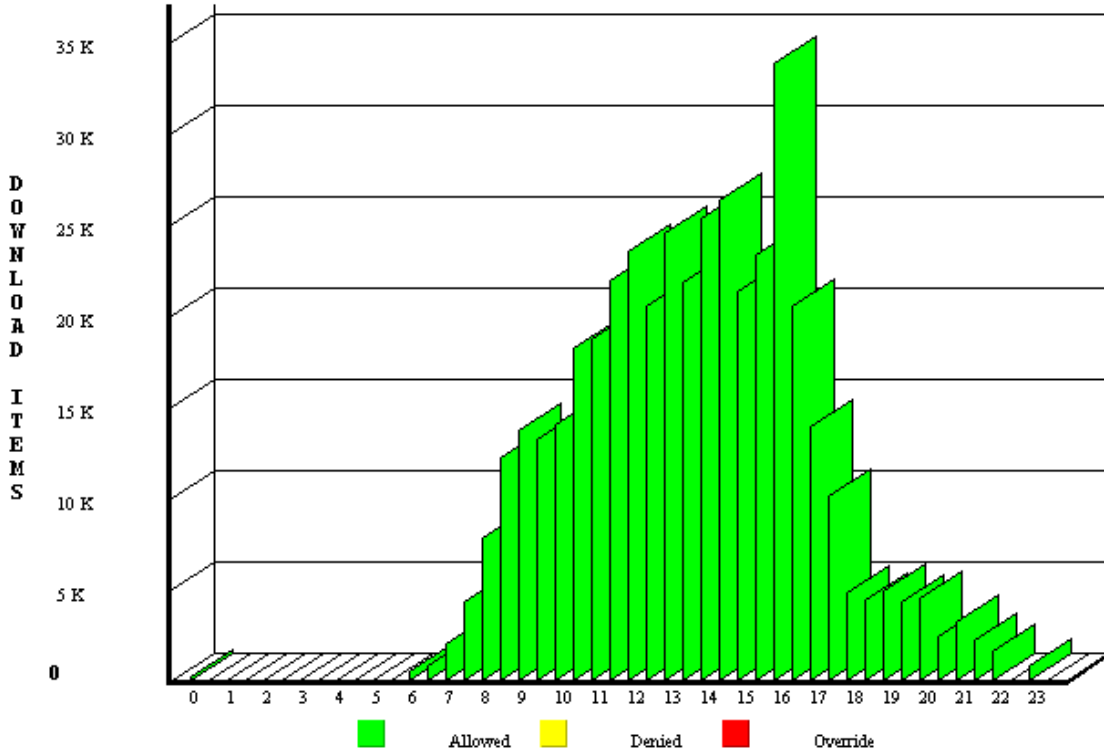


Figure 4: Number of hits at 30-minute intervals

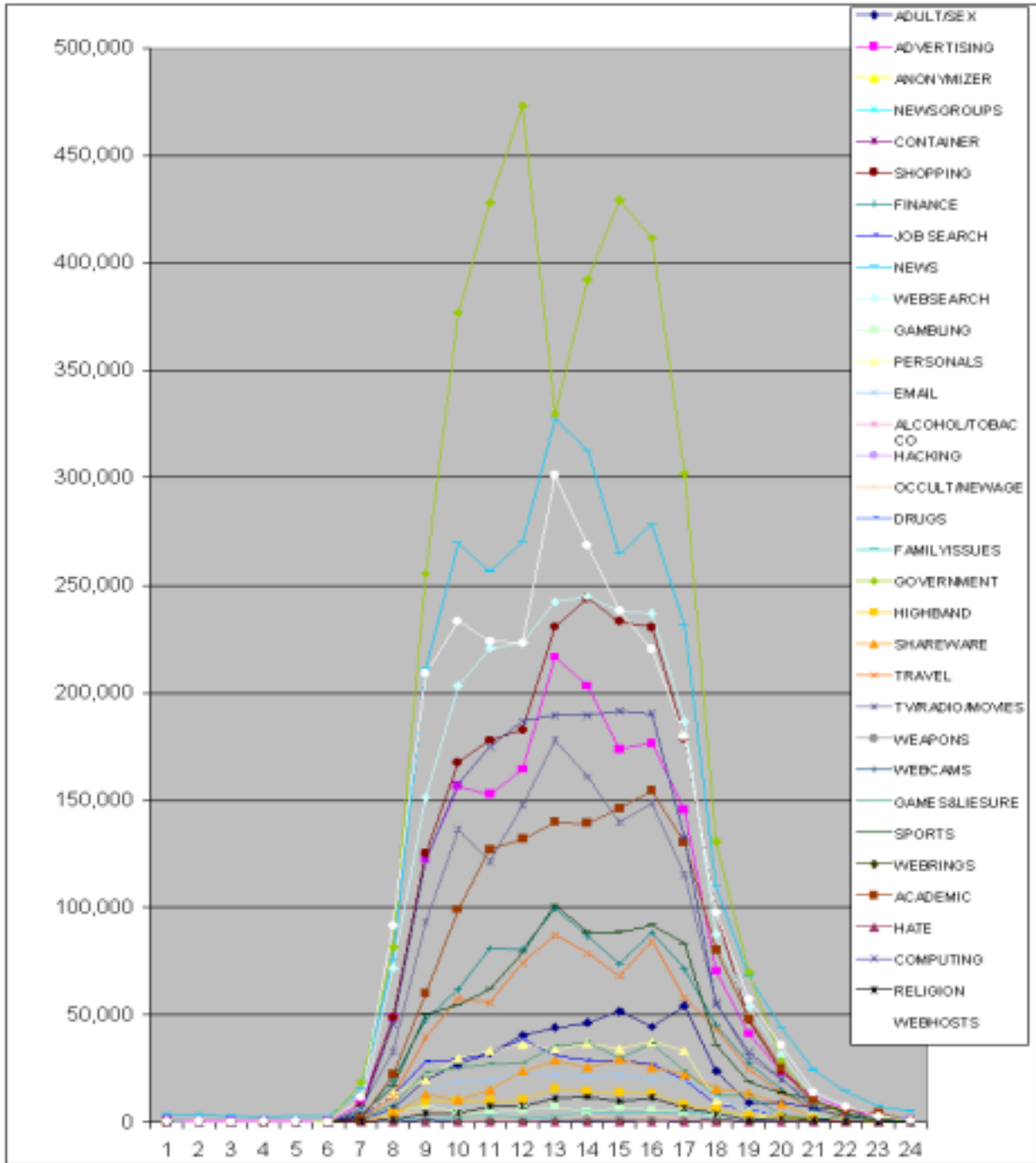
**Discussion:** Unlike most organizations, *Your Company* will, at times, require access to adult and sexual/obscene or illegal content. This very fact is the reason *Your Company* has an obligation to provide a methodology and system to assess legitimate from illegitimate access.

Obviously under the regulations of the federal government (ATIP), access to information is widely available, so each network user should document legitimate accesses to “adult/sexual, obscene and illegal” materials should scrutiny occur. Each user should be provided with the ability to protect themselves during research and documentation phases of their work and delegated activities. *YOUR COMPANY* is involved in complicated litigation and investigations, so the onus is on management to provide their front lines with the best tools and equipment to complete their objectives and protect the organization from unnecessary criticism.

It is worth noting that a recent press release by Staff-Inspector Gary Ellis, head of the Toronto Police sex crimes unit was reported by Jonathan Kingston of Sun Media saying “*Companies are responsible and accountable for the material going through their computers.*” Later during that conversation he was also quoted as saying “*Employers need to know they are responsible for every piece of hardware. They have the right to look at the e-mail messages and activities of their employees while at work.*”



**Sample Trend Analysis – Content Category by Time of Day**



*Figure 5: Internet Activity Trend Analysis by Time of Day*

### Tier3 Report – Comprehensive Internet Audit and Activity Analysis

- Includes:**
- In Depth Analysis of **ALL** Web Content Categories
  - Policy Audits for **Security, Liability and Productivity**
  - Risk Assessments and Recommendations
  - Firewall logs broken down by Internet Category, Hits, and Bandwidth by Time/Date
  - Top **Fifteen** URL's per Category
  - Price: \$50,000CAN

#### Sample Security Policy Analysis – Mail Category

This category contains URLs that have offer free email services. E.g. Hotmail, WebMail

Date	Hits	Bandwidth (bytes)
Monday October 21	19,614	127,060,214
Tuesday October 22	19,389	106,511,040
Wednesday October 23	22,264	120,481,343
Thursday October 24	21,327	127,307,224
Friday October 25	17,980	128,366,435
Saturday October 26	308	1,886,487
Sunday October 27	395	1,929,151
Monday October 28	24,084	131,980,512
Tuesday October 29	22,407	122,889,564
Wednesday October 30	22,435	124,434,547
Thursday October 31	21,311	119,438,211
Friday November 01	21,532	132,413,947
<b>Totals</b>	<b>213,046</b>	<b>1,244,698,675</b>

**Table 6: Hits and Bandwidth Consumption**

Site	Hits
webmail.sfu.ca	16417
ncmail.netscape.com	11694
webmail.bloor.is.net.cable.rogers.com	9941
v2.prontomail.com	8857
mail.ncf.ca	7447
webmail-m05.webmail.aol.com	6905
f202.mail.yahoo.com	6421
webmail-m03.webmail.aol.com	6257
mail.zonejeux.com	6118
www.ezboard.com	5714
f211.mail.yahoo.com	4762
mail.magma.ca	4372
web1.ezboard.com	3584
ezboard.com	3198
webmail.magma.ca	3193

**Table 7: Top Fifteen Hits for Category**

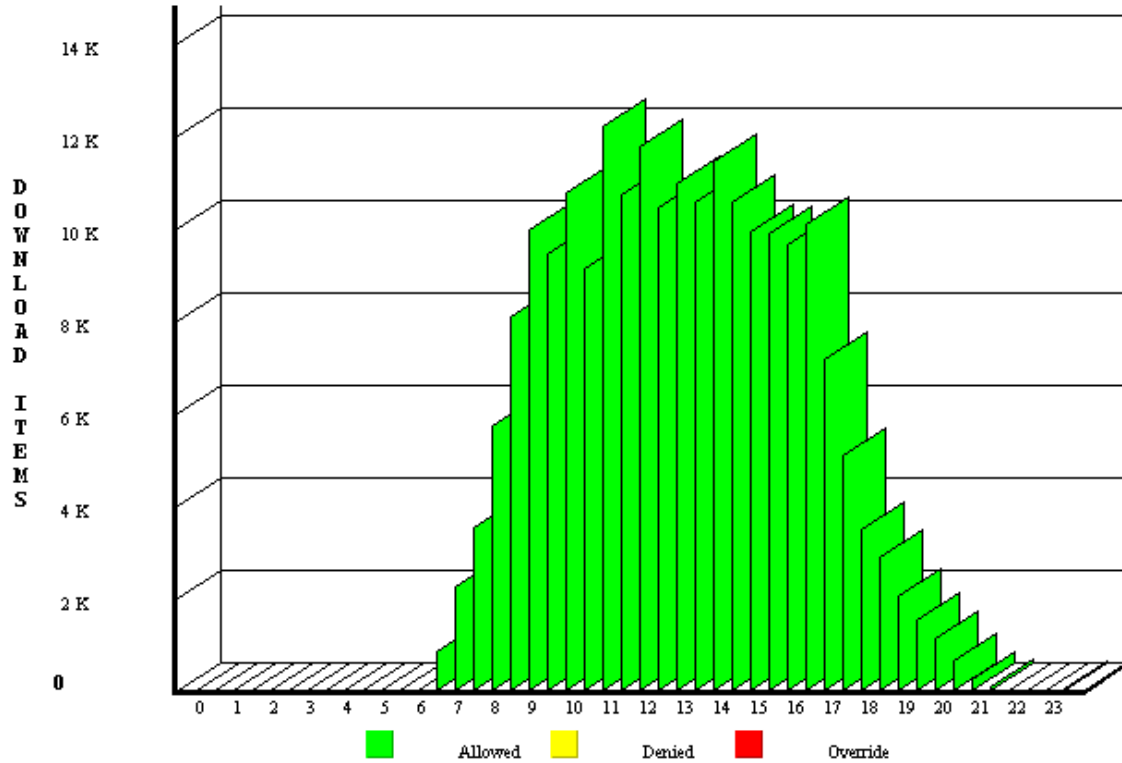
Site	Megabytes
webmail.bloor.is.net.cable.rogers.com	77.42
mail.canada.com	48.86
f202.mail.yahoo.com	46.40
f211.mail.yahoo.com	44.94
ncmail.netscape.com	44.47
v2.prontomail.com	39.77
f123.mail.yahoo.com	37.36
webmail.telus.net	27.82
webmail.magma.ca	27.22
webmail.sfu.ca	27.12
mail.ncf.ca	26.11
mail.icqmail.com	23.96
f138.mail.yahoo.com	23.10
webmail-m03.webmail.aol.com	22.11
webmail-m05.webmail.aol.com	21.33

**Table 8: Top Fifteen Bandwidth Consumers**

**Hourly Data (items)**

Fri Dec 13 10:28:48 EST 2002

Boolean Searching: Mon Tue Wed Thu Fri Sat Sun AND From : 1 Oct, 2002 To: 13 Dec, 2002 AND 0 : 00 - 23 : 59



**Figure 5: Number of hits at 30-minute intervals**

**Discussion:** This topic is of great concern to a department that handles personal and classified information. Departments in general go to great lengths to insure that their email service is of excellent quality for their users. Monitoring department email is often considered where privacy and security issues are concerned. Opening a back door that provides easy access to unauthorized information or a gateway for information to leak from *Your Company* should not be allowed to exist. Private and free web mail and free mail accounts are available on most pornographic, singles and personal web sites. This security issue can have grave consequences if an organization is subject to scrutiny under HIPPA, Privacy Laws or other security compliant regulatory bodies such as ITAR and the Canadian Controlled Goods Regulation Program.

**Risk Assessment:** Liability, Productivity, Security, Network performance

**Recommendation:** All remote access to email not processed through *Your Company's* email servers should be discontinued. *Your Company* should also consider an in depth analysis of their current email server to insure that all precautions including unauthorized encryption such as steganography are not threats to confidential, private or classified information. Furthermore, *Your Company* should investigate how their email resources are being used.



**Media Storage Device Audit – Text, Images and Videos**

- Includes:**
- Complete, timely examination of Media Storage Device for illicit material
  - Price: Contact BAJAI

**Email Audit – Email and Email Attachments**

- Includes:**
- Complete, timely examination of email and email attachments for illicit material
  - Price: Contact BAJAI

**Steganographic Cleansing**

- Includes:**
- Process images to remove Steganographically encrypted messages
  - Price: Contact BAJAI



### **About BAJAI**

**BAJAI** was formed in 2000, founded on the expertise of Ph. D. computer scientists who specialize in computer vision, and artificial intelligence classification theory, efficiency and graphing algorithms. BAJAI provides patented, technologically advanced solutions to our customers for Internet forensic and on-line activity management. Our customers utilize these solutions to effectively manage their Internet environments

**BAJAI Inc.** is an award winning Product Company that specializes in Online Activity Management (OAM) solutions. BAJAI Inc.'s products are the **most** effective because they are the **only** OAM solutions utilizing artificial intelligence to classify ALL electronic media, including text, images, movies and link relationships, meta tags, and rich media.

BAJAI's iajaBot™ robotic farm automatically classifies content 24 hours a day, every day. Tirelessly combing the web, the robots utilize OCULAR™ technology to continually create the most up-to-date and accurate web classification list available. OCULAR™ performs ON-THE-FLY image analysis, which eliminates the threats associated with newly posted offensive materials. Unfamiliar URL's are scanned for offensive images and blocked if they are deemed in violation of organizational policy. This ensures that BAJAI's characterization and classification methodologies provide the most protection from undesired content, with the least amount of misclassification. BAJAI's override privileges provide management with a tangible tool to assess user compliance when searching the Internet. The override capability also guarantees that productivity is not affected by a misclassification, or a rare need to access information generally not complying with policy.

**BAJAI Internet Forensics Services Group** provides forensic audits and analysis of internet activity and media storage device content. The services team also provides consultation during OAM implementation and policy development. Being uniquely qualified as award winning domain experts, BAJAI's services team is regularly called upon to discuss and present in the scientific and corporate community.

**BAJAI Scientific Group** provides customized solutions, based on OCULAR™ and iajaBot™ artificial intelligence technologies, for specialized applications in law enforcement and forensic security research. From stripping subversive communications from steganographically encrypted images, to training iajaBots™ to recognize children in electronic images, or to unleashing iajaBots™ to find and engage potential child predators in on-line conversations to flush them out, BAJAI's scientist can help law enforcement agencies police the Internet.