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- INTELLIGENCE ALERT -

CIGARETTES LACED WITH COCAINE BASE IN BLAINE, WASHINGTON

The DEA Western Regional Laboratory (San Francisco, California) recently received an opened cigarette pack containing 18 cigarettes with twisted ends (total net mass 14.0 grams), suspected to contain cocaine (see Photo 1). The cigarettes were seized pursuant to a vehicle search by Immigration and Customs Enforcement agents in Blaine, Washington (at the border). The cigarettes and package appeared to be commercially manufactured, and had well-known commercial logos and labelling (but oddly, for two different brands of cigarettes). Upon closer inspection, the tobacco in the cigarettes was covered by a fine, off-white powder (see Photo 2, next page; shown oversize to display detail). Analysis of a methylene chloride extract by GC/MS and IR-ATR confirmed approximately 20 percent cocaine base (equivalent to an average of 155 milligrams of cocaine base per cigarette). This was first submission of cocaine-laced cigarettes to the Western Laboratory.

Photo 1

Photo 2

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- INTELLIGENCE ALERT -

LARGE OPIUM POPPY PLANTATION IN HERINGTON, KANSAS

Photo 3

The DEA North Central Laboratory (Chicago, Illinois) recently received two exhibits of suspected opium poppy plants. The first exhibit consisted of 10 intact poppy plants (total net mass 1,152 grams), complete with roots and multiple pods (see Photo 3). The second exhibit consisted of three boxes of pods (total net mass 4,741 grams). The material was acquired by agents from the DEA Kansas City District Office and the Kansas State Police from a large poppy plantation outside a residence in Herington, Kansas (Herington is located in east/central Kansas). In total, approximately 14,000 plants were seized (see Photo 4, next page). The collection was done during a rain storm and the plants were still wet when submitted to the laboratory, and had to be air dried for several days before analysis. The selected pods for both exhibits were crushed, soaked in saturated sodium bicarbonate, and extracted with chloroform. Analysis of the extracts by

GC/MS identified morphine, codeine, and papaverine, confirming opium (alkaloids not quantitated, but apparently in relatively low concentrations). Based on interviews with the homeowners and no evidence of cultivation efforts or opium collection (all pods were unincised), the agents determined there was no criminal intent (apparently, the homeowners merely appreciated the appearance of the flowers, and were unaware of the legal status of opium poppies). The non-submitted plants were destroyed. This was the largest poppy plant/pod exhibit ever submitted to the North Central Laboratory.

Photo 4

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- INTELLIGENCE ALERT -

WATER SOLUBLE MATRIX (CONTAINING COCAINE) SEIZED IN OR NEARBY VILLAVICENCIO, COLOMBIA, SOUTH AMERICA

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received an exhibit of a blue-green, rubber-like material (total net mass 42 grams) that was alleged to contain cocaine (see Photo 5). The exhibit was acquired by a Colombian Anti-Kidnapping Unit in or nearby Villavicencio, Colombia, South America (circumstances of seizure not reported). The sample was coated with a white powdery residue, measured approximately 100 x 65 millimeters, and ranged in thickness from 1 to 3 millimeters. Field-testing of the material and the powdery residue did not indicate the presence of cocaine. Experimentation determined that the material would dissolve in water with vigorous vortexing, suggesting it was gelatin (not rubber or plastic) based. Analysis of a chloroform extract of the basified liquid by GC and GC/MS confirmed 13.6 percent cocaine (calculated as the hydrochloride) and aminopyrine (not quantitated). Further analysis of the white powdery residue by GC, FTIR-ATR, and microscopy confirmed that it did not contain cocaine or aminopyrine. While samples composed of various plastic matrices containing cocaine have been previously

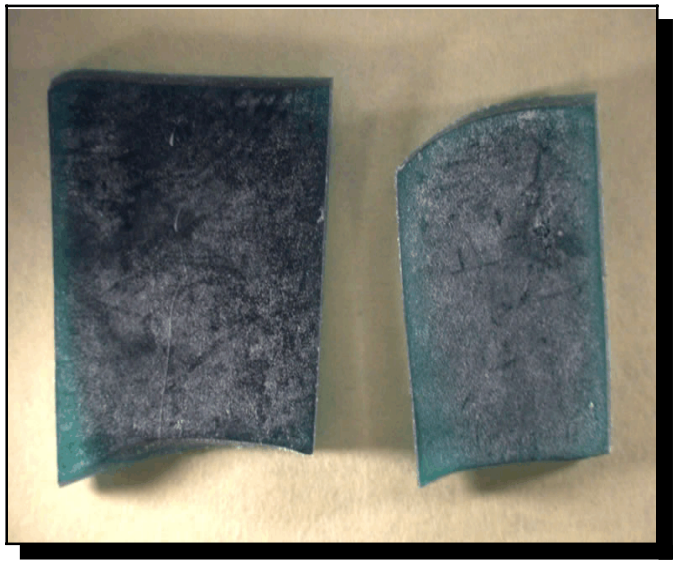

Photo 5 (2 of 56 cut up pieces)

submitted to the Special Testing and Research Laboratory, this is the first submission of a water-soluble matrix containing cocaine. It is unclear how this material would be used as a smuggling aid; however, past reports have indicated use of similar materials in a wide variety of consumer products (suitcase linings, hat brims, clothing, etc.).

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- INTELLIGENCE ALERT -

THC-LACED PSILOCYBIN MUSHROOMS IN PERRIS, CALIFORNIA

The California Department of Justice Riverside Crime Laboratory (Riverside, California) recently received a submission of apparent psilocybin mushrooms (see Photo 6). The mushrooms (total net mass approximately 125 grams) were seized by the Riverside County Sheriff's Office (Perris Station) pursuant to a routine traffic stop in Perris (Perris is located south-southeast of Riverside). Preliminary screening of a methanolic extract by GC, however, indicated both psilocin/psilocybin and Δ^9-tetra-hydrocannabinol (THC). Additional testing (Duquenois/Levine and GC/MS) confirmed both psilocin/psilocybin and THC. The controlled substances were not quantitated; however, the amount of THC was significant and consistent with deliberate adulteration. Since there was no evidence of cannabis in the sample, it appears that the mushrooms were soaked in or sprayed with a solution of THC. According to the analyst, this was the first case of THC-laced psilocybin mushrooms at the Riverside Crime Laboratory in his 15 years experience.

Photo 6

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- INTELLIGENCE BRIEF -

METHAMPHETAMINE LABORATORIES SEIZED IN BEL AIR, MARYLAND AND COLLINSVILLE, PENNSYLVANIA

[From the NDIC *Narcotics Digest Weekly* 2005;4(35):1
Unclassified, Reprinted with Permission.]

On July 14, 2005, federal and state law enforcement officials seized two methamphetamine laboratories near Bel Air (MD) and one in Collinsville (PA). Surveillance determined that seven members of a criminal group operated the three red phosphorus method laboratories, and authorities believe that the laboratories had been operational since 2004. One laboratory was

located in a trailer on a farm near Bel Air and is the largest seized in the state in the last 5 years; up to a pound of methamphetamine could have been produced per production cycle at this laboratory. Two of the arrestees and their 5-year-old daughter lived in the trailer. The second laboratory seized in Bel Air was located in the basement of a residence. Both Bel Air laboratories were in the final stages of methamphetamine production at the time of the seizures. The Collinsville methamphetamine laboratory was located in a residence reportedly owned by a relative of a member of the criminal group. The two smaller laboratories had production capacities of one-quarter to one-half ounce per production cycle. The methamphetamine producers also distributed the drug - usually in multigram-quantities - to local methamphetamine users. Four of the arrested individuals were indicted in federal court; each faces a possible maximum sentence of 40 years in prison. The other three individuals face state charges in Maryland. The Drug Enforcement Administration (DEA), Harford County (MD) Sheriff's Office, Pennsylvania State Police (PSP), and U.S. Attorney's Office for the District of Maryland conducted the investigation.

NDIC Comment: These laboratory seizures are significant because methamphetamine production, distribution, and abuse had not posed a major threat to Maryland prior to 2005. In addition to the seizures reported above, law enforcement officers in Charles and St. Mary's Counties seized a methamphetamine laboratory in La Plata on July 19, 2005, bringing the total number of methamphetamine laboratories seized in Maryland in 2005 to six. According to the Washington/Baltimore High Intensity Drug Trafficking Area (HIDTA), the number of methamphetamine laboratories seized in Maryland increased from two in 2001 to eight in 2004. In comparison, methamphetamine production, distribution, and abuse have been increasing in Pennsylvania since 2000, particularly in the northern tier counties. The number of methamphetamine laboratories seized in Pennsylvania increased from 19 in 2001 to 128 in 2004, and as of early August 2005, PSP reported 78 laboratory seizures throughout the state.

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SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. Patents are reported only by their *Chemical Abstracts* citation number.]

1. Alabdalla MA. **Chemical characterization of counterfeit Captagon tablets seized in Jordan.** Forensic Science International 2005;152(2-3):185. [Editor's Notes: Samples from 124 seizures were analyzed by GC/MS. Contact: Forensic Science Laboratory, Department of Chemical Analysis, P.O. Box 330069, Amman 11134, Jordan.]

2. Blachut D, Wojtasiewicz K, Czarnocki Z. **Some pyridine derivatives as "route-specific markers" in 4-methoxyamphetamine (PMA) prepared by the Leuckart method.** Forensic Science International 2005;152(2-3):157. [Editor's Notes: The authors claim that several newly identified "high-boiling pyridines" may be especially useful synthetic markers, since they are unlikely to be removed from the final products even via careful purification techniques. Contact: Internal Security Agency, Department of Criminalistics, 1 Sierpnia 30A, Warsaw 02-134, Pol.]

3. Camilleri AM. **Underground pill testing, down under.** Forensic Science International 2005;151(1):53. [Editor's Notes: Laboratory results of tablets voluntarily submitted by users at a "Rave" were compared with the results of on-site color testing. Contact: Forensic Science South Australia, 21 Divett Place, Adelaide, Australia.]

4. Campbell JG, Grossman SI. **Apparatus for detecting drugs in a beverage.** (Patent) Chemical Abstracts 2005;143:54892g.

5. Hewavitharana AK, Golding G, Tempany G, King G, Holling N. **Quantitative GC-MS analysis of Δ^9-tetrahydrocannabinol in fiber hemp varieties.** Journal of Analytical Toxicology 2005;29(4):258. [Editor's Notes: Presents the title study, for regulation of industrial varieties of hemp. Contact: Queensland Health Scientific Services, Archerfield, 4108 Australia.]

6. Lachenmeier DW, Walch SG. **Analysis and toxicological evaluation of cannabinoids in hemp food products.** Electronic Journal of Environmental, Agricultural and Food Chemistry 2005;4(1):(No Page Numbers). [Editor's Notes: An overview of the title topic. Includes discussion of the "hemp food products" situation in the European Union. Contact: Chemisches und Veterinaeruntersuchungsamt Karlsruhe, Karlsruhe D-76187, Germany.]

7. Liu J-T. **GC-MS and pentafluoropropionic anhydride derivatization methods for the differentiation of 3,4-methylenedioxymethamphetamine (MDMA) from their regioisomeric 1-(3,4-methylenedioxyphenyl)-2-ethylamines (MDPEAs).** Huaxue 2005;63(1):95. [Editor's Notes: The derivatives are claimed to be easier to differentiate via GC/MS versus the parent amines. This article is written in Chinese. Contact: Forensic Science Center, Ministry Police Command, Ministry of National Defense, Taipei, Taiwan.]

8. Mitrevski B, Zdravkovski Z. **Rapid and simple method for direct determination of several amphetamines in seized tablets by GC-FID.** Forensic Science International 2005;152(2-3):199. [Editor's Notes: Included the analyses of MDA, MDMA, MDEA, and MBDB as well as amphetamine and methamphetamine. Contact: Forensic Science Unit, Ministry of Internal Affairs, Dimce Mircev bb, Skopje 1000, Macedonia.]

9. Nguyen DT, Bui TH. **Analysis of amphetamines in narcotic samples.** Tap Chi Duoc Hoc 2005;45(2):20. [Editor's Notes: Uses a combination of color reactions, TLC, and GC to perform both qualitative and quantitative analyses. The "narcotics" were primarily methamphetamine and MDMA, most in tablet form. This article is written in Vietnamese. Contact: Phan Vien Khoa hoc Hinh su Bo Cong An, Vietnam.]

10. Sharma SP, Purkait BC, Lahiri SC. **Qualitative and quantitative analysis of seized street drug samples and identification of source.** Forensic Science International 2005;152(2-3):235. [Editor's Notes: Presents the analysis of heroin seized in eastern India, using GC/MS and HPTLC. Some minor (mostly unsuccessful) efforts were made to determine the respective sources of the drugs based on the analytical results. Contact: Central Forensic Science Laboratory, 30 Gorachand Road, Kolkata, WB 700014, India.]

11. Swist M, Wilamowski J, Parczewski A. **Determination of synthesis method of Ecstasy based on its basic impurities.** Forensic Science International 2005;152(2-3):175. [Editor's Notes: MDMA was synthesized via five different methods, and the impurity profiles of the respective routes determined by GC/MS. Contact: Department of Analytical Chemistry, Faculty of Chemistry, Jagiellonian University, Ingardena 3, Krakow 30-060, Pol.]

12. Wu G, Cai X, Xiang B. **Identification of synthesis routes of "Ecstasy" by GC-MS coupled soft independent modeling of class analogies.** Sepu 2005;23(2):214. [Editor's Notes: Uses GC-MS coupled SIMCA to link impurity profiles to synthetic routes for MDMA. This article is written in Chinese. Contact: Analytical Test Center, China Pharmaceutical University, Nanjing, Jiangsu, Peop. Rep. China 210009.]

13. Yi C, Tao Y, Wang B, Chen X. **Electrochemiluminescent determination of methamphetamine based on tris (2,2'-bipyridine)ruthenium(II) ion association in organically modified silicate films.** Analytica Chimica Acta 2005;541(1-2):75. [Editor's Notes: Presents the title study. Contact: Key Laboratory of Analytical Sciences of Ministry of Education, Department of Chemistry, Xiamen University, Xiamen, Peop. Rep. China 361005.]

Additional References of Possible Interest:

1. Bleisteiner B, Geiger R, Yvon J. **Raman micro spectroscopy. Today a routine analytical method.** CLB Chemie in Labor und Biotechnik 2005;56(3):74. [Editor's Notes: A review. Applications include narcotics (unspecified in the abstract). Contact: HORIBA, Bensheim, Germany.]

2. Ninomiya T. **X-ray spectrometry in forensic research.** X-Ray Spectrometry 2004:553. [Editor's Notes: A review, focusing on total reflection X-ray fluorescence and synchrotron radiation X-ray fluorescence. Applications not stated in the abstract. Contact: Forensic Science Laboratory, Hyogo Prefectural Police Headquarters, Chou-Ku, Kobe, Japan 650-8510.]

3. Skrinska VA. **Measurement of 3,4-MDMA and related amines in diagnostic and forensic laboratories.** Clinical Laboratory Science 2005;18(2):119. [Editor's Notes: Abstract and Contact information not provided.]

4. Tapsoba I, Belgaied JE, Boujlel K. **Voltametric assay of guaifenesin in a pharmaceutical formulation.** Journal of Pharmaceutical and Biomedical Analysis 2005;38(1):162. [Editor's Notes: Presents the title study. Contact: INSAT, BP 676, Tunis 1080, Tunisia.]

5. Wang S-M, Chye S-M, Liu RH, Lewis RJ, Canfield DV, Roberts J. **Mass spectrometric data of commonly abused amphetamines and their derivatives - Cross contributions of ion intensity between the analytes and their isotopically labeled analogs.** Forensic Science Reviews 2005;17(2):67. [Editor's Notes: Presents the title study, using GC/MS. Contact: Department of Medical Technology, Fooyin University, Ta-Liao, Kaohsiung Hsien, Taiwan.]

6. Zuccato E, Chiabrando C, Castiglioni S, Calamari D, Bagnati R, Schiarea S, Fanelli R. **Cocaine in surface waters: A new evidence-based tool to monitor community drug abuse.** Environmental Health 2005;4(14):(No Page Numbers). Editor's Notes: Analysis for trace cocaine in urban waste streams allow an indirect estimation of total abuse in the respective community (results from Italy). Contact: Department of Environmental Health Sciences, Mario Negri Institute for Pharmacological Research, Via Eritrea 62, 20157 Milan, Italy.]

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THE DEA FY - 2006 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY - 2006 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

November 14 - 18, 2005
February 6 - 10, 2006
May 8 - 12, 2006
July 10 - 14, 2006
September 11 - 15, 2006

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

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SCIENTIFIC MEETINGS

1. Title: Midwestern Association of Forensic Scientists (MAFS) Annual Fall Meeting (Fifth and Final Posting)
Sponsoring Organization: Midwestern Association of Forensic Scientists
Inclusive Dates: October 3 - 7, 2005
Location: St. Louis, MO
Contact Information: Bryan Hampton, bhampton -at- saintcharlescounty.org
Website: None

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EMPLOYMENT OPPORTUNITIES

1. U.S. Drug Enforcement Administration (First Posting)
Position: Forensic Chemist (Up to 10 Positions Available)
Location: Dallas, Texas
Salary Range: $32,084 (GS-5) - $67,033 (GS-11) - Promotional potential to GS-13
Application Deadline: Open Until Filled
Detailed Information and Application: https://www.avuedigitalservices.com/dea/applicant.html
Vacancy Announcement Number: DEA-SCLAB-05-0297-MP (Merit Promotion) or DEA-SCLAB-05-0297-DEU (All Others)

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2. U.S. Drug Enforcement Administration (First Posting)
Position: Fingerprint Specialist (1 Position Available)
Location: San Francisco, California
Salary Range: $57,178 - $105,939
Application Deadline: Open Until Filled
Detailed Information and Application: https://www.avuedigitalservices.com/dea/applicant.html
Vacancy Announcement Number: DEA-WEST-05-0293-MP (Merit Promotion) or DEA-WEST-05-0293-DEU (All Others)

Computer Corner #198

Digital Evidence Courtroom Vocabulary

by Michael J. Phelan
DEA Digital Evidence Laboratory

The presentation of digital evidence findings in court can be challenging. The digital evidence examiner must be able to reduce even a highly complex evidence handling and examination process to an easy-to-comprehend, but accurate, description of how the potential case-related information was recovered - and must also be able to explain the potential significance of the findings. One of the more important responsibilities for the examiner is to limit the use of technical jargon in both the formal written report and during actual oral court testimony. Although most jurors probably use a computer or electronic data communication/storage device (e.g., a cell phone, Personal Digital Assistant, or digital camera) on a regular basis, their understanding of basic digital electronics or computers is very limited - and furthermore may be partly or wholly incorrect. An effective expert witness will minimize juror confusion by employing non-technical language and explanations whenever feasible, or by supplementing technical terminology with simple, descriptive analogies.

A list of frequently used computer forensic and general computer technical terms is compiled below. Each technical term is followed by a simple phrase that describes the term (the italic wording within the parentheses) along with a more formal and comprehensive definition.

Computer Forensic Terminology:

Cookie (*Commercial ID tag*) Small block of data placed on the hard drive to uniquely identify a user or computer. Cookie data is usually pushed onto a user's computer over the Internet to facilitate identification of a previous customer.

Encryption (*Data hiding*) Commercially available or proprietary software that systematically scrambles and unscrambles information. Scrambled data is stored in a standard file format.

Erased File (*File marked as" erased" and not directly accessible to a user*) File type that may be overwritten by the computer to store other types of information.

Hash Set (*File fingerprints*) Group of known files and their corresponding hash values that are used to eliminate benign files (negative hash) from further examination (such as standard computer operating system files) or identify (positive hashing) files of known interest (such as child pornography images).

Image File (*Digital evidence copy*) File that contains an accurate representation of the original evidence.

Log Data (*Activity summary*) Automated recording of user, computer networking, or computer operating activity that may contain software installation and setting information, user registration data, or a running account of a computer process.

MD-5 Hash (*Copy verification technique*) Computer program that summarizes the constituent components of any type of digital information into a summary value which has a known calculated estimate of certainty. The probability of two files being different but having the same MD-5 hash value is 1 in 2^{128} (i.e., the number 34 followed by 37 zeros).

Media (*Data storage device*) Any internal or external computer data storage device such as diskettes, tapes, data cartridges (Zip or Jaz), flash memory cards, thumb drives, etc.

Meta Data (*File attribute information*) Data that documents file access privileges such as create, edit, delete, print or contains date/time information regarding file creation, edit, and last access.

Password Protected (*Data locking*) Software security logic that contains instructions that prevents a file from being accessed unless a previously defined string of characters is entered first by the user.

Slack Space (*Filler keystroke data*) Data inserted at the end of any file that optimizes the transfer of blocks of data within a computer. Can contain user keystroke or printed data that was retained in memory as part of some other recent computer process.

Steganography (*Data hiding*) Commercially available or proprietary software that systematically scrambles and unscrambles information. Scrambled data is stored within a document, picture, audio, or standard file format making detection difficult.

Swap File or **Page File** (*Digital scratch pad area*) Reserved hard drive data storage area that is managed by a computer operating system and is inaccessible to most computer programs. It may contain user or system created data that was recently processed in the computer.

Temporary Internet Folder (*Internet web page copies*) Contents of visited web pages that are stored in this hard drive folder to facilitate rapid reloading of web page information from local hard drive storage and avoid lengthy retransmission over the network.

Unallocated Cluster or **Free Space** (*File fragment information*) Digital evidence storage area that contains computer system data or user keystroke data.

Volatile Memory (*Data storage area that requires a constant source of electrical current*) Type of memory that is found in many consumer electronic devices that require continuous electrical power (usually battery operated) to operate and continuously store data. Cell phones and two-way pagers are examples. Volatile memory devices are highly susceptible to data loss.

Wiped (*Overwritten*) Term denotes the obliteration of original digital data by overwriting the storage location one or more times. Wipe software is used in digital forensics to eliminate the possibility of any data contamination on media from a previous case. The software is also used as a computer security tool to permanently eliminate sensitive information.

Write Block (*Data lock*) Hardware device or software program that prevents data being inadvertently placed on a media (in digital evidence, on the original evidence).

General Computer Terminology:

Compressed (*Data abbreviation*) Data that is systematically reduced in size and contains the essential content of the original. Data compression is often used to speed up data transmission by making transmission packets smaller, or more efficiently stores a large volume of data (i.e., in a smaller area).

Computer Virus (*Malicious computer program*) Computer instructions or programs that change, erase, or relocate stored user data or computer programs for malicious reasons. Other forms of computer "malware" include "spyware" (transmits out user computer activity), keystroke loggers, or screen capture programs.

CPU (short for *Central Processing Unit*) Computer component which is either: 1) the case that contains the main processing components including the central logic unit, main memory, power supply, data bus, and interface controllers (video, sound, networking, communications), and cooling systems (fans and heat sinks); or 2) the central component in a computer that is responsible for both arithmatic computation and logic branching, or for comparisons.

Drive (short for "*Hard drive*") Refers to a large capacity - high performance data storage device found in almost all computers. Hard drives may be logically clustered together for data redundancy or performance benefits.

Folder (*File cabinet*) Organizational technique to store similar file types or information types to make user access more straightforward.

Internet (commonly referred to as the *World Wide Web*) Worldwide, computer based, information transmission and storage network. Consists of web hosting sites, e-mail servers, news groups, and e-commerce portals.

Logical Data (*Files, folders, partitions*) Data structures that exist as part of the standard operating system formatting process.

Physical Data (*Data stored at a specific location*) Data located at a specific storage address that exists independent of any operating system format, or file format.

Script (*Computer program*) Specialized or "on the fly programs" that process raw data to enhance usefulness. Often used to eliminate data errors, or sort, select, append, or truncate larger data files into smaller data files.

Questions or comments? E-mail: Michael.J.Phelan -at- usdoj.gov

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