RSA CONFERENCE 2014

FEBRUARY 24 – 28 | MOSCONE CENTER | SAN FRANCISCO

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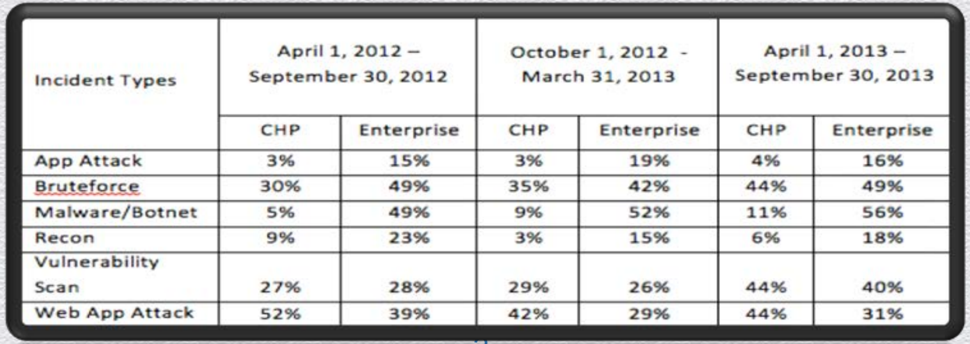
Computer Forensics and Incident Response in the Cloud

SESSION ID: ANF-T07A

Stephen Coty
AlertLogic, Inc.
@Twitter AlertLogic_ACID

Why forensics in the cloud?

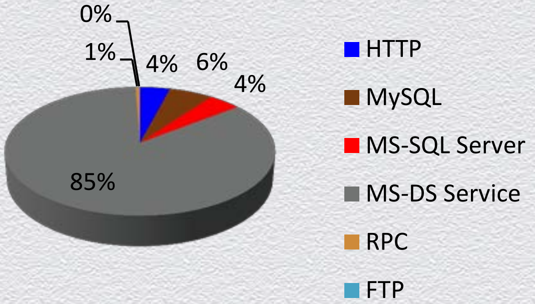
- Cloud market revenue will increase at a 36% annual rate, PR News
- Analysts expect AWS revenues to hit $6 billion - $10 billion in 2014
- Microsoft Azure to reach $1 billion in annual sales
- Oracle Cloud bookings increase by 35% in the 3rd quarter this year
- VDI (Desktop as a Service) market reached $13.4 billion in 2013
- Gartner predicts 60% of banking institutions to migrate to the cloud



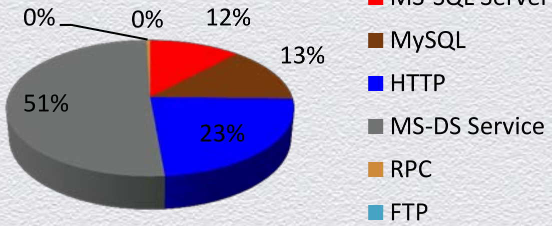
Incident Types	April 1, 2012 – September 30, 2012		October 1, 2012 - March 31, 2013		April 1, 2013 – September 30, 2013	
	CHP	Enterprise	CHP	Enterprise	CHP	Enterprise
App Attack	3%	15%	3%	19%	4%	16%
Bruteforce	30%	49%	35%	42%	44%	49%
Malware/Botnet	5%	49%	9%	52%	11%	56%
Recon	9%	23%	3%	15%	6%	18%
Vulnerability Scan	27%	28%	29%	26%	44%	40%
Web App Attack	52%	39%	42%	29%	44%	31%

What Attacks are hitting the Cloud Space

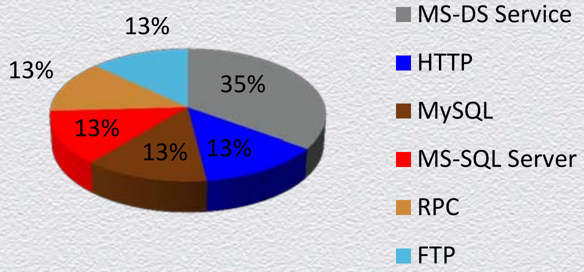
Asia Honeypots



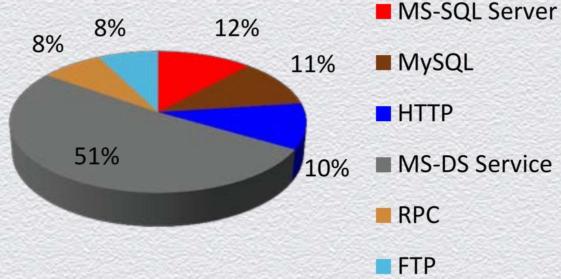
US Honeypots



Europe Honeypots

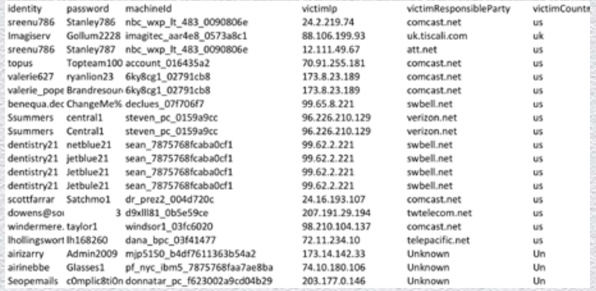


Global Honeypots

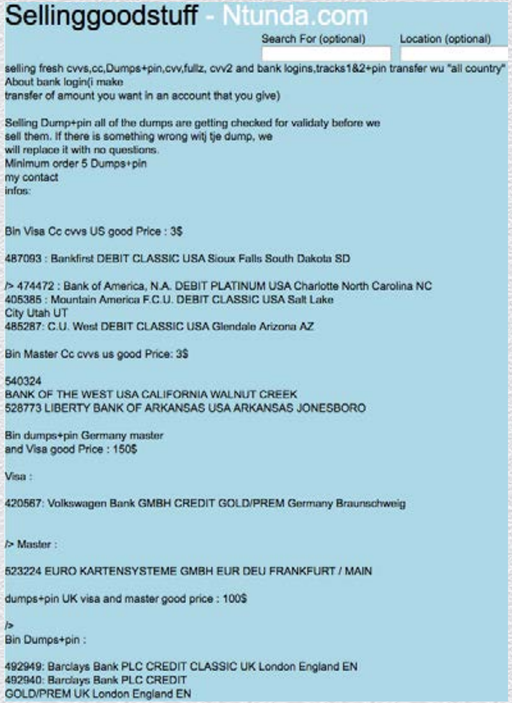


When is digital forensics in the cloud required

- Investigation into organized cyber crimes
- Investigation into Acceptable Use Policy violations
- Data Recovery, Intentional or Accidental
- 3rd Party reports of suspicious activity
- Fraudulent builds for malicious activity
- Data Breaches



identity	password	machineId	victimIp	victimResponsibleParty	victimCount
sreenu786	Stanley786	nbc_wxp_lt_483_0090806e	24.2.219.74	comcast.net	us
Imagiserv	Gollum2228	imagitec_aar4e8_0573a8c1	88.106.199.93	uk.tiscali.com	uk
sreenu786	Stanley787	nbc_wxp_lt_483_0090806e	12.111.49.67	att.net	us
topus	Topteam100	account_016435a2	70.91.255.181	comcast.net	us
valerie627	ryanlion23	6ky8cg1_02791cb8	173.8.23.189	comcast.net	us
valerie_pope	Brandresoun	6ky8cg1_02791cb8	173.8.23.189	comcast.net	us
benequa.dec	ChangeMe%	declues_07f706f7	99.65.8.221	swbell.net	us
Ssummers	central1	steven_pc_0159a9cc	96.226.210.129	verizon.net	us
Ssummers	Central1	steven_pc_0159a9cc	96.226.210.129	verizon.net	us
dentistry21	netblue21	sean_7875768fcaba0cf1	99.62.2.221	swbell.net	us
dentistry21	jetblue21	sean_7875768fcaba0cf1	99.62.2.221	swbell.net	us
dentistry21	Jetblue21	sean_7875768fcaba0cf1	99.62.2.221	swbell.net	us
dentistry21	Jetbule21	sean_7875768fcaba0cf1	99.62.2.221	swbell.net	us
scottfarrar	Satchmo1	dr_prez2_004d720c	24.16.193.107	comcast.net	us
dowens@soı	3	d9xlll81_0b5e59ce	207.191.29.194	twtelecom.net	us
windermere.	taylor1	windsor1_03fc6020	98.210.104.137	comcast.net	us
lhollingswort	lh168260	dana_bpc_03f41477	72.11.234.10	telepacific.net	us
airizarry	Admin2009	mjp5150_b4df7611363b54a2	173.14.142.33	Unknown	Un
airinebbe	Glasses1	pf_nyc_ibm5_7875768faa7ae8ba	74.10.180.106	Unknown	Un
Seopemails	c0mplic8ti0n	donnatar_pc_f623002a9cd04b29	203.177.0.146	Unknown	Un



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my contact
infos:

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City Utah UT
485287: C.U. West DEBIT CLASSIC USA Glendale Arizona AZ

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528773 LIBERTY BANK OF ARKANSAS USA ARKANSAS JONESBORO

Bin dumps+pin Germany master
and Visa good Price : 150$

Visa :

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/> Master :

523224 EURO KARTENSYSTEME GMBH EUR DEU FRANKFURT / MAIN

dumps+pin UK visa and master good price : 100$

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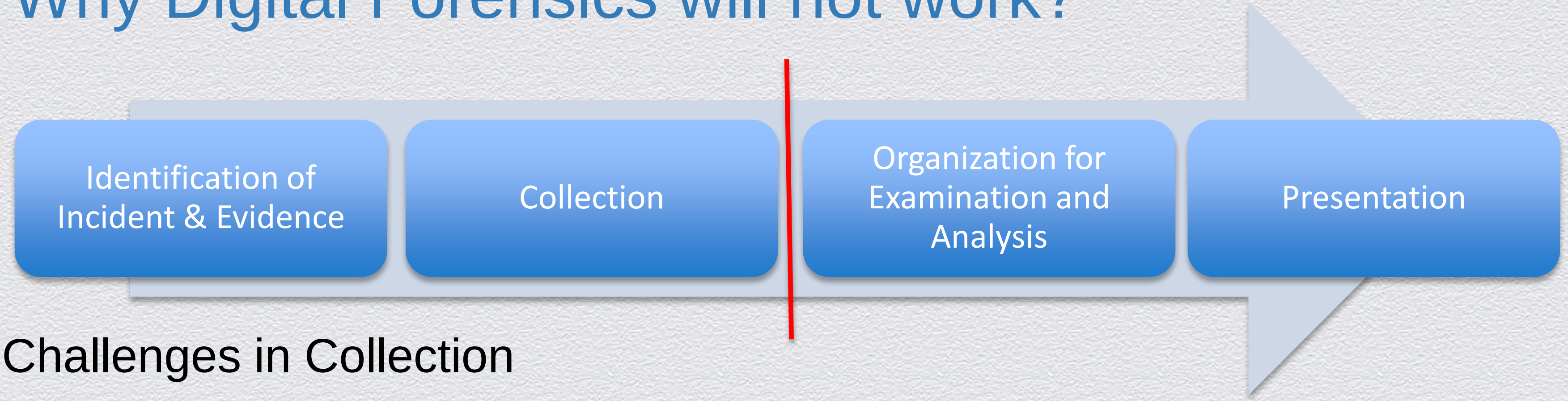
Bin Dumps+pin :

492949: Barclays Bank PLC CREDIT CLASSIC UK London England EN
492940: Barclays Bank PLC CREDIT
GOLD/PREM UK London England EN

Challenges with Digital Forensics in the Cloud

- Investigators do not have the physical control of the media nor the network
- Massive database infrastructure uses customer relationship management systems and social graphs that current forensics cannot address
- With the nature of cloud computing there are challenges with the chain of custody
- Who owns the data and what is the expectation of privacy as a customer
- Oregon State vs Bellar
  - Judge Timothy Sercombe wrote “Nor are a person’s privacy rights in electronically stored personal information lost because that data is retained in a medium owned by another”

Why Digital Forensics will not work?


Identification of Incident & Evidence

Collection

Organization for Examination and Analysis

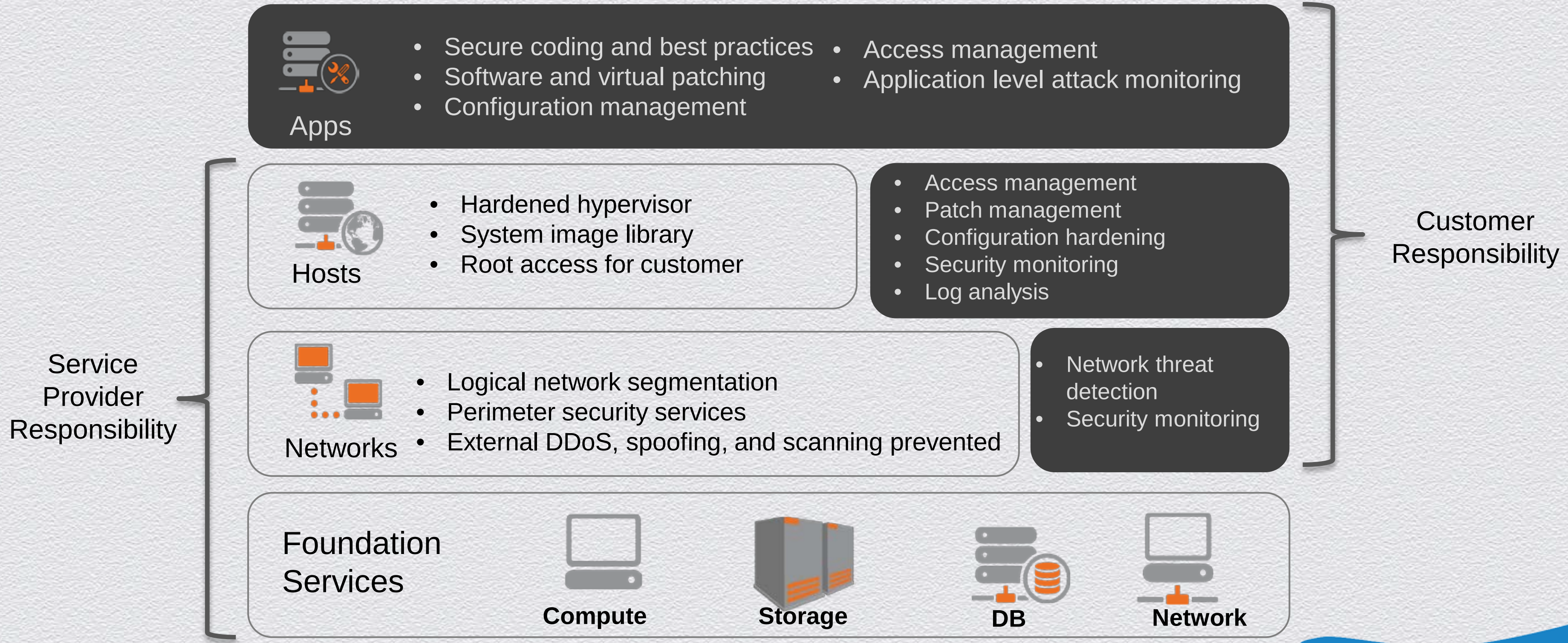
Presentation

- Challenges in Collection
  - Seize servers containing files from many users creates privacy issues with others
  - Trustworthiness of evidence is based on the cloud providers “word”
  - Investigators are dependent on cloud providers to acquire evidence
  - Technician collecting data may not be qualified for forensic acquisition
  - Unknown location of the physical data can hinder investigations

Think Network Forensics, it's the only way

- Traditional digital forensic data collection is still appropriate for many investigations.
- There is a growing number of cases, with the adoption of virtual technology and the cloud, where it is not practical or impossible to conduct digital forensics
- Relies on Limited data to examine
  - Captured Packets
  - Reviewing Log Data
  - Cloned Servers from Server Administrators
  - Looking for key words in parsed data
  - Reviewing any type of IDS or WAF event data

Understanding your Service Provider



Apps

- Secure coding and best practices
- Software and virtual patching
- Configuration management
- Access management
- Application level attack monitoring

Hosts

- Hardened hypervisor
- System image library
- Root access for customer

- Access management
- Patch management
- Configuration hardening
- Security monitoring
- Log analysis

Networks

- Logical network segmentation
- Perimeter security services
- External DDoS, spoofing, and scanning prevented

- Network threat detection
- Security monitoring

Foundation Services

Compute

Storage

DB

Network

Service Provider Responsibility

Customer Responsibility

Shared Customer and Service Provider Responsibility

- Enabling a logging solution of the virtual server
- Amazon Cloud has Cloud Trail that logs API calls to your instance
- Providing an IDS designed for the cloud can provide a level of protection and logging of security related events.
- Ability to perform deep packet forensics in a virtual environment
- Researchers have proposed various applications to conduct forensic memory analysis in virtual environments
- Multi Jurisdiction and multi-tenancy Service Level Agreements (SLA)

Forensic Process and tools in the Cloud

- Have Primary server relocated in the cloud
  - Keep compromised device online while you move the customer to a new instance
  - Have service provider take a “Snap Shot” of the compromised server
  - Run Forensic Investigation on the compromised device live
- Tools
  - WireShark – Collects Packets
  - Network Miner – Collects Data about the Host

Credits

- http://www.securitywizardry.com/index.php/products/forensic-solutions/remote-forensics.html
- http://www.linkedin.com/pub/andrew-bennett/4/193/203
- https://www.asdreports.com/news.asp?pr_id=2116
- http://www.dfrws.org/2012/proceedings/DFRWS2012-10.pdf
- https://www.alertlogic.com/resources/cloud-security-report/

Link to Ciphx and other Open Source Tools

- http://df.shsu.edu/ciphix.html
- http://www.mcafee.com/us/downloads/free-tools/index.aspx

Q&A