When Tinfoil Hats Aren't Enough: Effective Defenses Against APTs

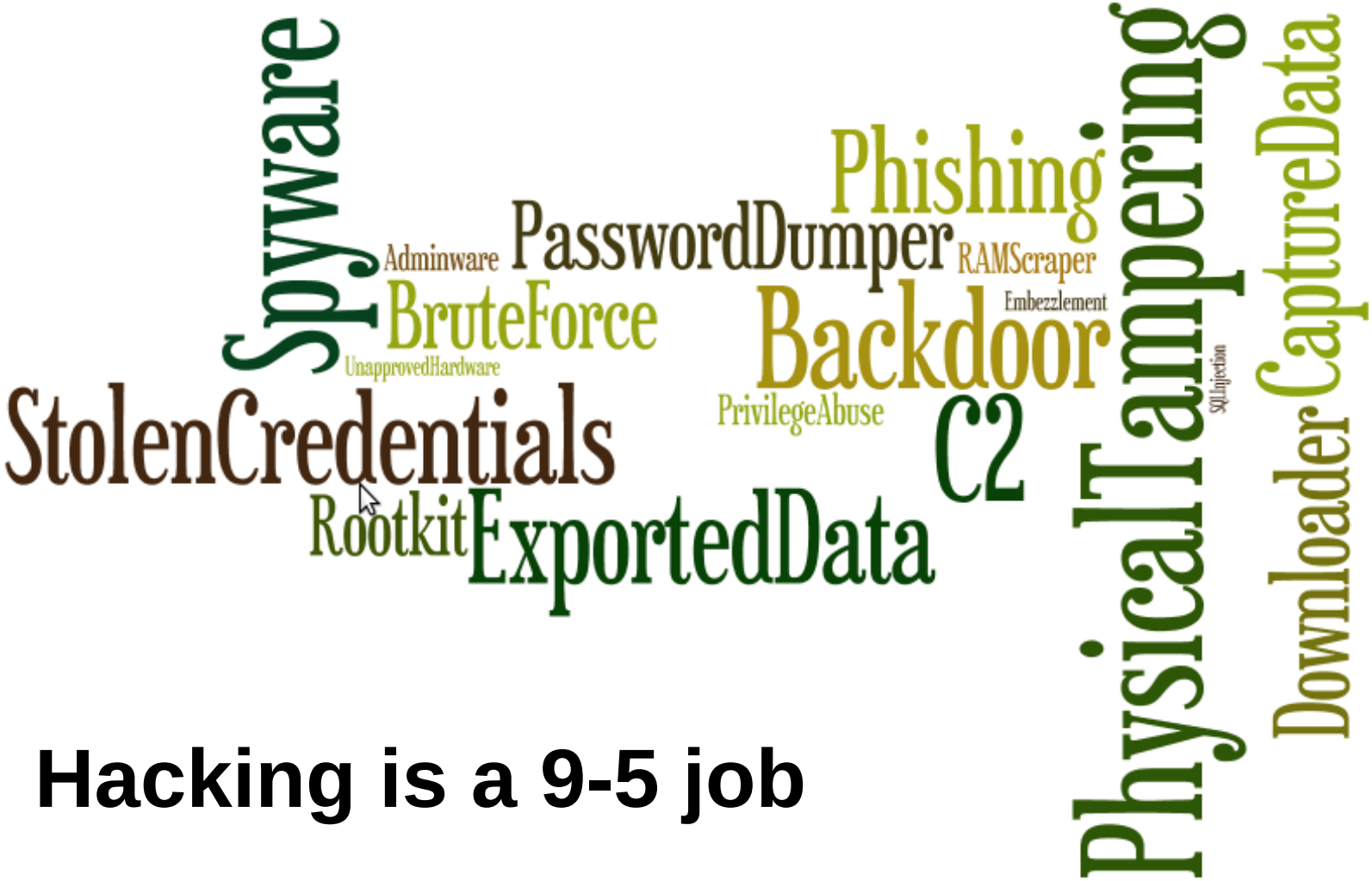
David Corlette, Product Manager

June 11, 2014

NetIQ

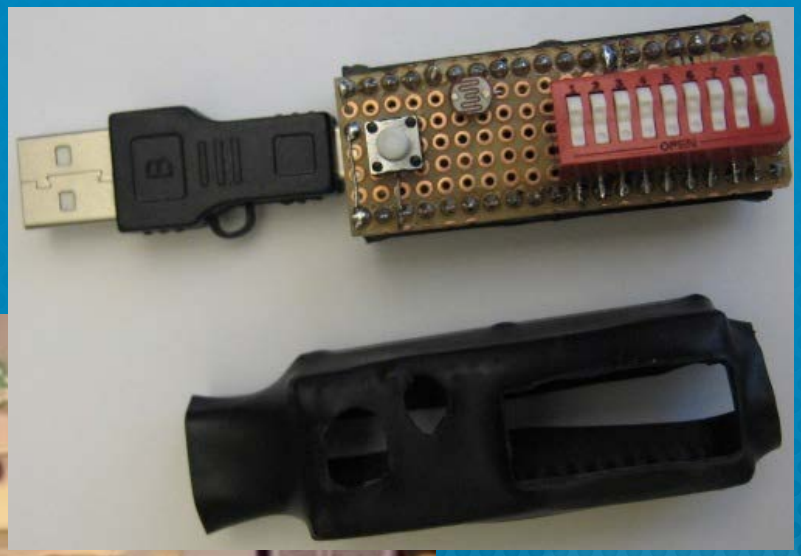
The Problem

Threats are becoming more complex



Hacking is a 9-5 job

USB Programmable Keyboard



Landscape is also more complex

Cloud

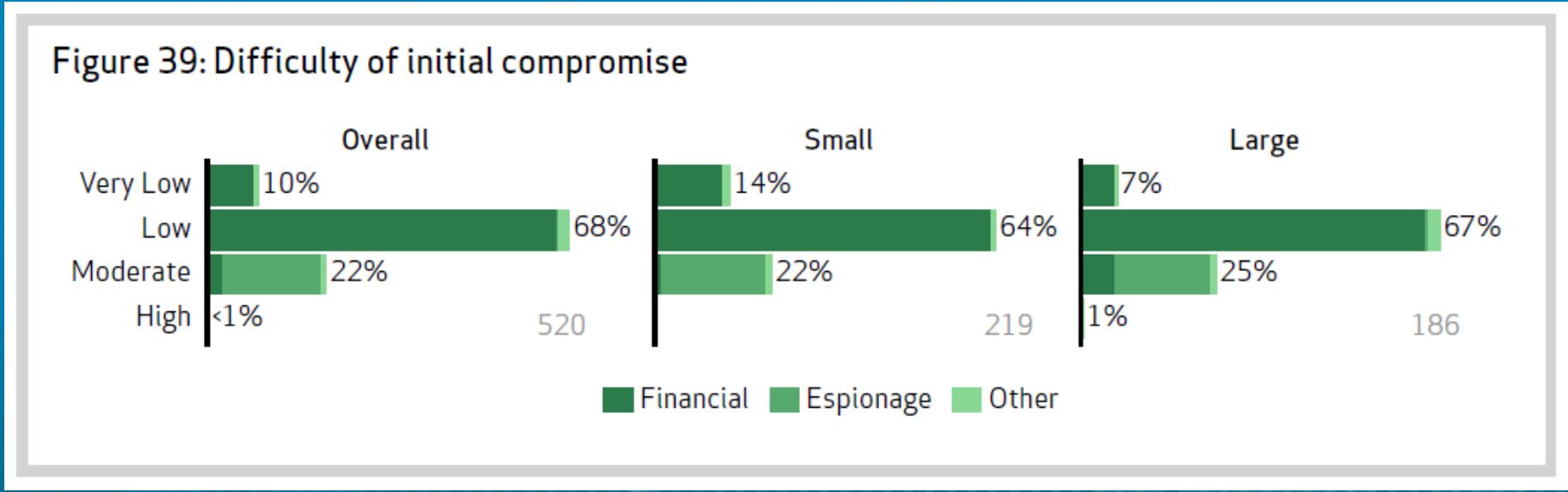
Mobile

BYOD

Social

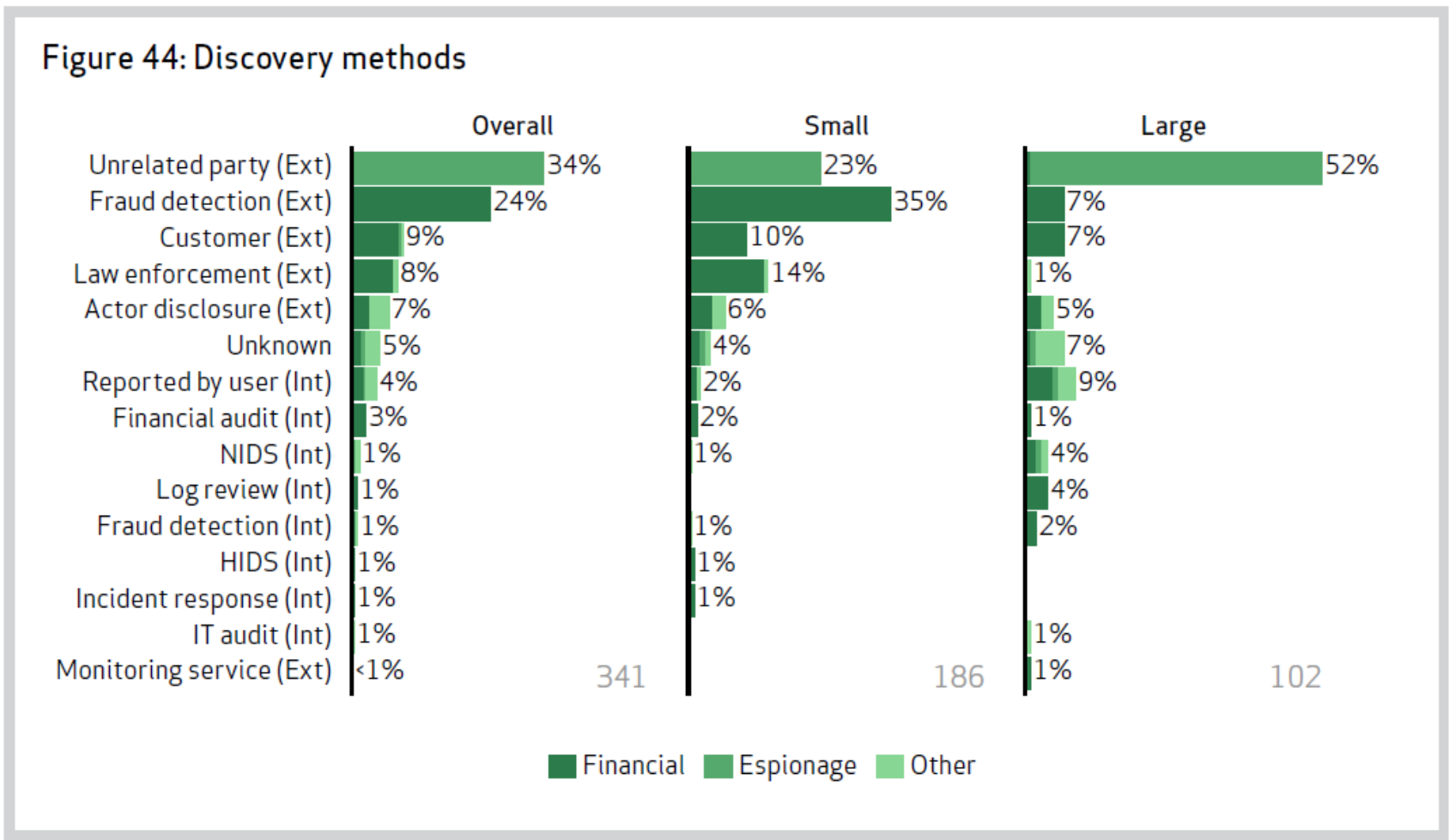
The “attack surface” is ever-expanding

“Not me, we’re safe…”

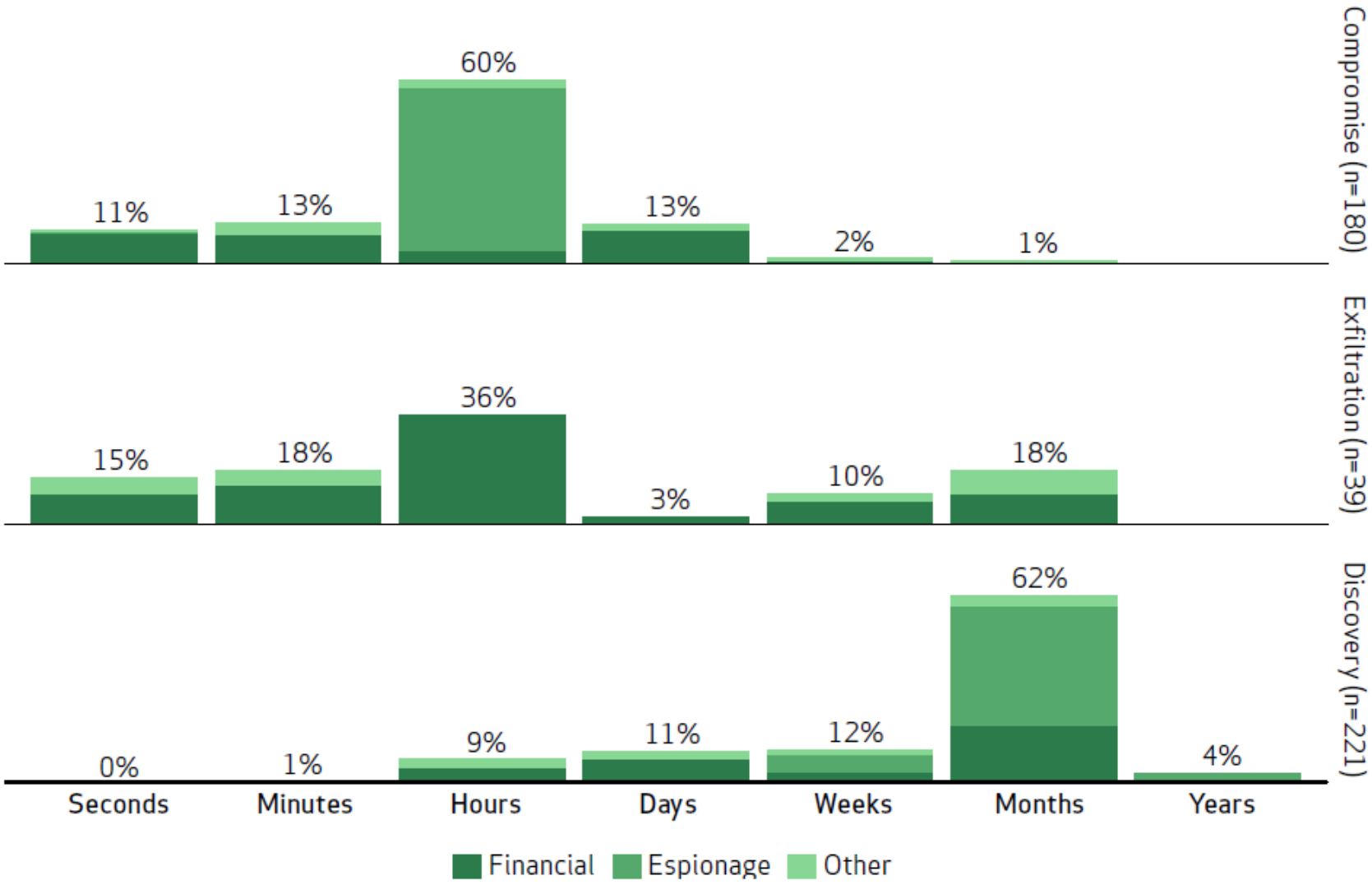


2013 Verizon Data Breach Investigations Report

Insult to Injury



Then Kick You While You're Down



Crusty Shells

Least-privilege Access

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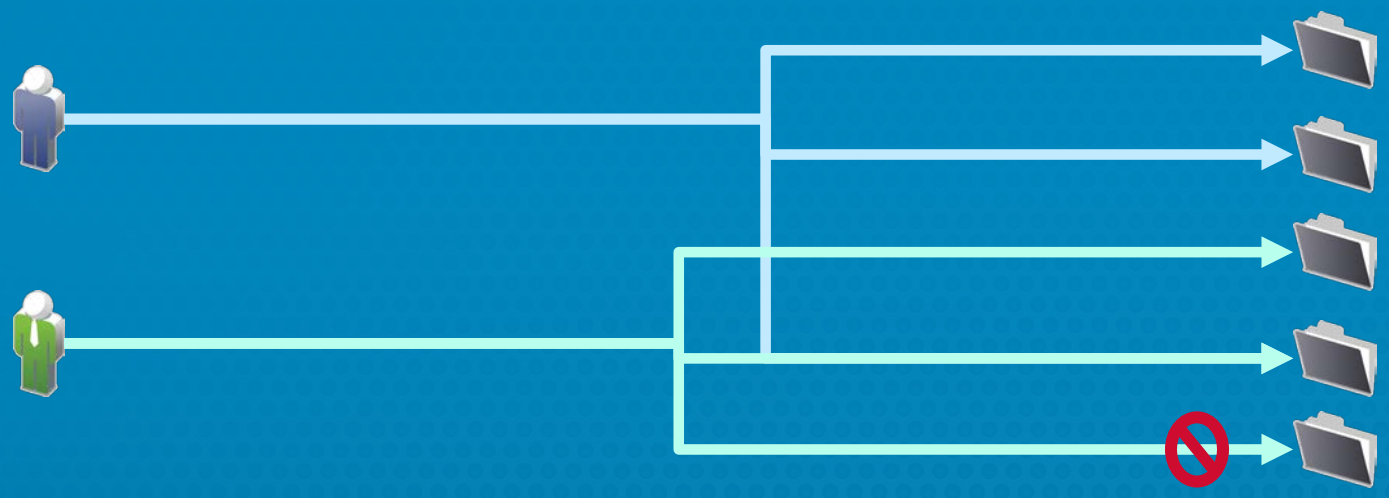


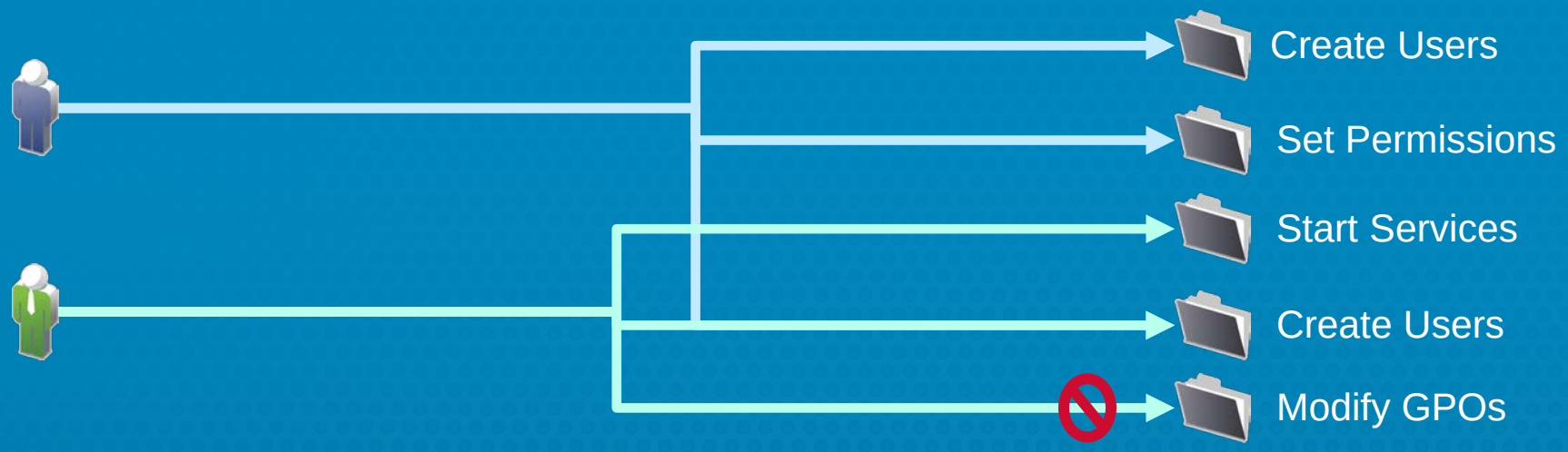
- Role-based access and entitlements
- Request approval workflows
- Automatic real-time de-provisioning

BUT!!!!!!!

- Still have privileged users who can do anything

Privileged User Management

$$



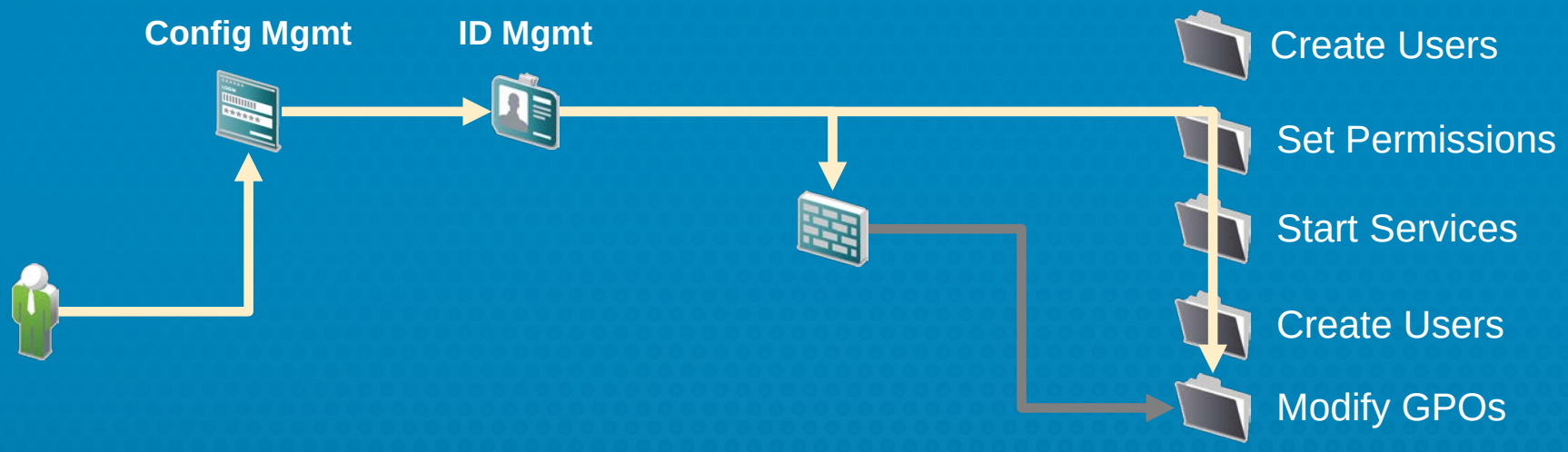
- Granular privileged access and/or password vaults
- Often add finer auditing, keystroke logging

BUT!!!!!!!

- Still have privileged users who can do Bad Things, and you'll only find out afterwards

Dynamic Config Management

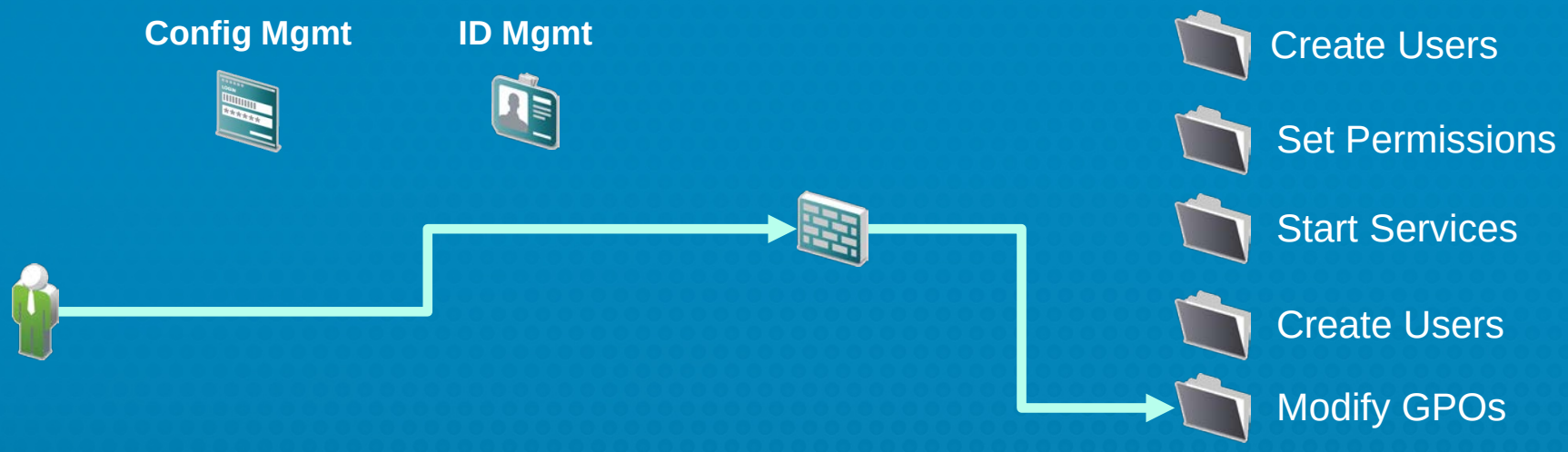
$$$



- Request including what, when
- Approved by N managers/reviewers
- Dynamically provision privileged accounts, secure passwords, even network routes to allow configuration changes to occur

Dynamic Config Management

$$$$



- Monitoring of change to ensure that it adheres to the request parameters
- Auditing, review, and roll-back
- Timeout de-provisioning of access

BUT!!!!!: Still More Issues!

$$$$$

- **Gets really costly**
- Can slow people down
- Still doesn't solve issues of
  - Insider threats (misuse of legitimate access)
  - Malware, stolen credentials
  - Social engineering

So now we need to add:

More Security Products!!

$$$$$

$$$$$

$$$$$

X-Ray Vision

Monitoring vs. Prevention

PREVENTION IS CRUCIAL, AND WE CAN'T LOSE SIGHT OF THAT GOAL. BUT WE MUST ACCEPT THE FACT THAT NO BARRIER IS IMPENETRABLE, AND DETECTION/RESPONSE REPRESENTS AN EXTREMELY CRITICAL LINE OF DEFENSE.

2013 Verizon DBIR

Too much… pressure!

Don Your Eyeglasses

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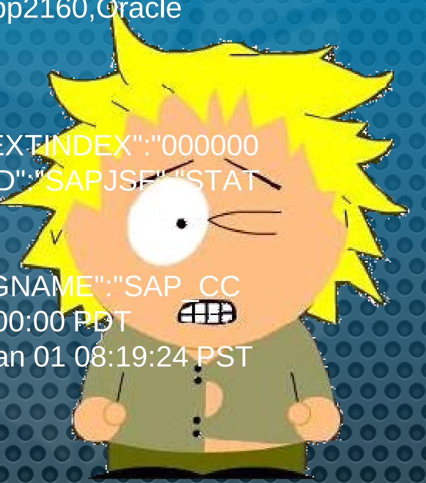
1120 0000000000000000002TSV2010-06-02-12.48.43.343776QPADEV000CQSECOFR 600091 QCMD QSYS
*SYSBAS 1 0000000000000000000000000000000000000000QSECOFR OMNIAS2
^@^@^@^@^@^@^@^@^@^@0000001057012915007088230 4AUDRCV0008QSYS *SYSBAS 1 1
^@^@^@^@^@^@^@^B00000000000000000243690
361363360K361362367K365K366367@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@

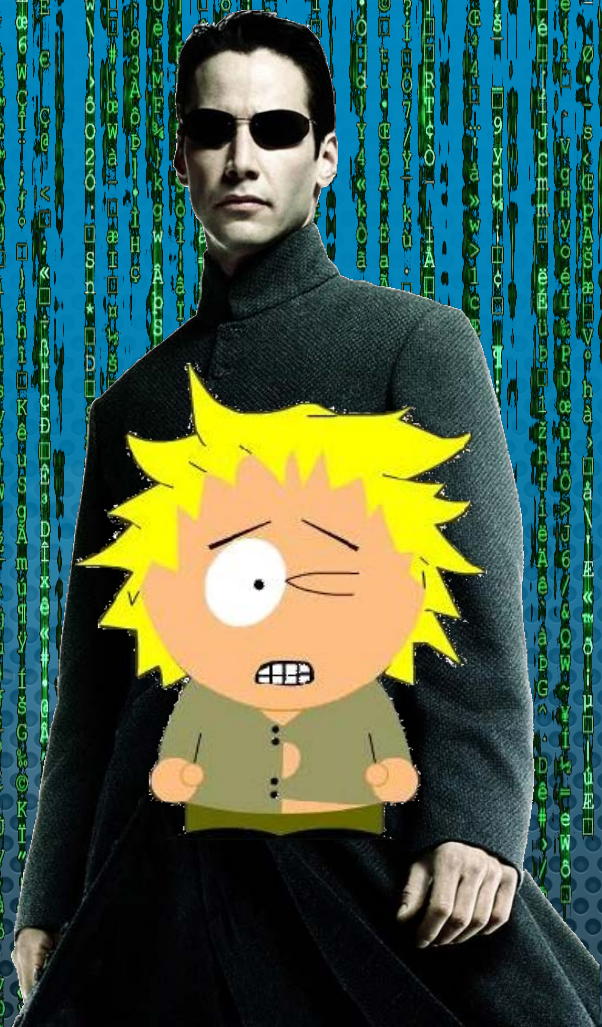
IN090210,ESECDBA,APPLABS\\DLFDTAPP0803,DLFDTAPP0803,2010\/04\/27 18:07:34,2010\/04\/27 18:08:52,2010\/04\/27 18:08:52,101,LOGOFF,,Authenticated by: DATABASE; Client address: (ADDRESS=(PROTOCOL=tcp)(HOST=192.168.170.11)(PORT=2788)),10187,1,1,0,,,,30553,,,,,dlfdtapp2160,Oracle Database 10g Enterprise Edition Release 10.2.0.3.0 – Prod

{"ALERT":{"MANDT":"001","MSG":"Logon Successful (Type=U)","REPORTEDBY":"SecurityAudit","MTMCNAME":"sapserver_DM0_01","ARGTYPE2":"C","EXTINDEX":"0000000012","OBJECTNAME":"Security","MSGARG2":"U&0","MTCLASS":"101","MSGARG1":"AU1","USERID":"SAPJSF","STATUS":"40","ARGTYPE4":"C","STATCHGDAT":"Tue Mar 24 00:00:00 PDT 2009","MTINDEX":"0000000176","VALUE":"2","MSGTEXT":"Security Audit: Logon Event","SEVERITY":"255","STATCHGBY":"SecurityAudit","ALSYSID":"DM0","ARGTYPE3":"C","MSEGNAME":"SAP_CCMS_sapserver_DM0_01","MSCGLID":"AU1","MTNUMRANGE":"033","ALERTDATE":"Tue Mar 24 00:00:00 PDT 2009","FIELDNAME":"Logon","ALUNIQNUM":"0000694352","MTSYSID":"DM0","ALERTTIME":"Thu Jan 01 08:19:24 PST 1970","STATCHGTIM":"Thu Jan 01 08:19:24 PST 1970","RC":"0","MSGID":"AU1","ALINDEX":"0000007340","ARGTYPE1":"C","MSGCLASS":"SAP-YSLOG","MTUID":"0000100010"},"SYSNR":"01","HOST":"192.168.3.7"}



We Can’t All Be Neo

- Who is doing what?
- What access do they have?
- Is that access appropriate?
- Where are they accessing from?
- Is this normal behavior?
- Are there other Indicators of Compromise for the same account/host/service?



A Balanced Plan

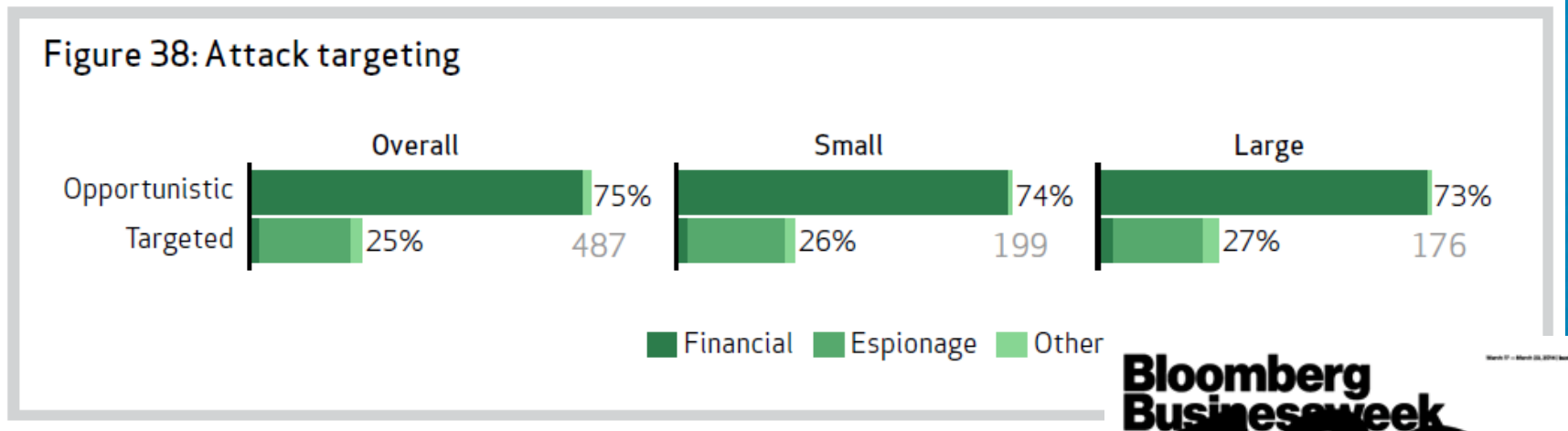
What is the key?

Identity

Remember Poor Tweek

- Who is doing what?
- What access do they have?
- Is that access appropriate?
- Where are they accessing from?
- Is this normal behavior?
- Are there other Indicators of Compromise for the same account/host/service?

Step 1: Don't Be An Opportunistic Target



- Establish a basic level of preventative controls **and monitoring** for all assets
- Make sure all employees know what to watch out for
- Establish basic access controls

Critical Cyber Controls

- Do the easy/cheap ones first!
- Certain initiatives, such as perimeter security and employee training, raise protection level of ALL assets
- Good sources:
  - SANS Top 20: **http://www.sans.org/critical-security-controls**
  - NIST Cyber Security Framework: **http://www.nist.gov/itl/upload/preliminary-cybersecurity-framework.pdf**
  - Australian Signals Directorate Top 35 Mitigations: **http://www.asd.gov.au/infosec/top-mitigations/top35mitigations-2014-table.htm**

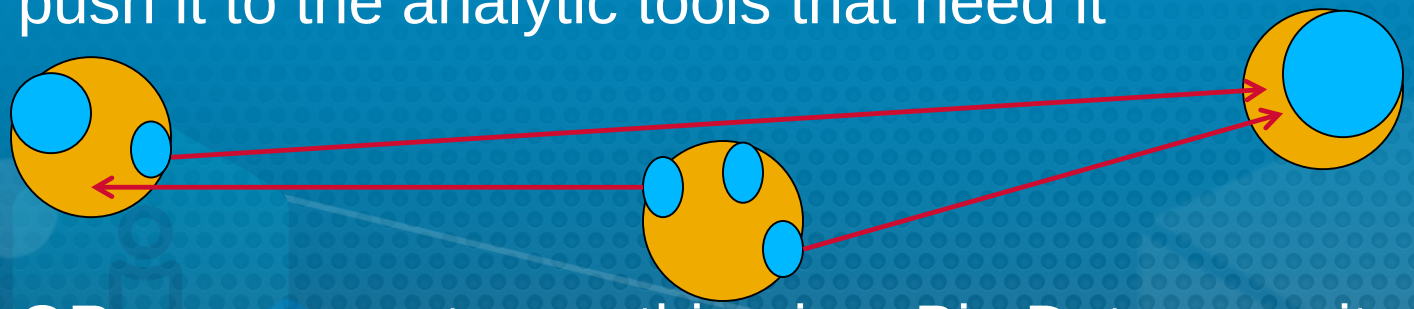
Step 2: Understand Resource Value

Selected Qtr (2015 Q3) Lic/FYM pipeline			
WW/Geo	Late Stage % of Pipeline	Pipeline to Bookings Gap (Ratio)	Total (Qtr) Pipeline
Worldwide	**73.2%**	**6.9**	**$24,527**
North America	73.1%	9.0	$20,273
EMEA	81.2%	4.0	$3,196
APAC	52.6%	2.6	$1,057
Latin America		**0.0**	$0

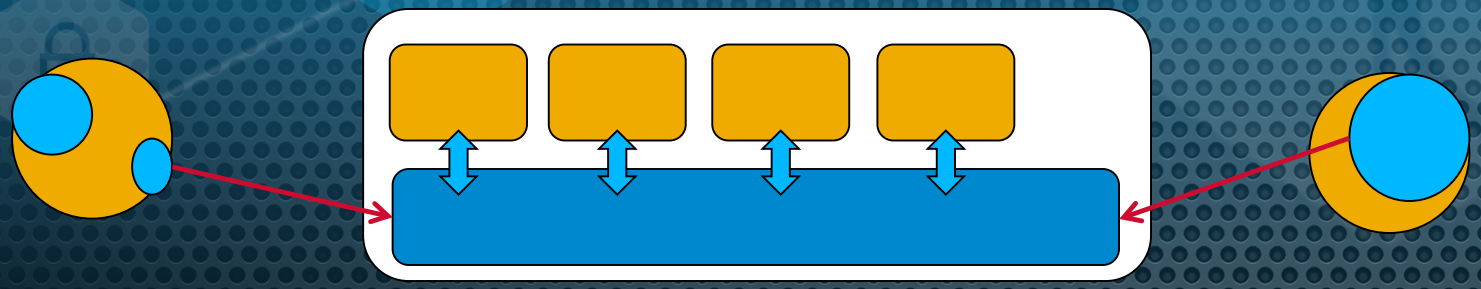
"And then he was like 'whatever' and she said 'no way' and I was like 'ewww…' and she was SO lame that I almost barfed and …"

Where Is My Data?

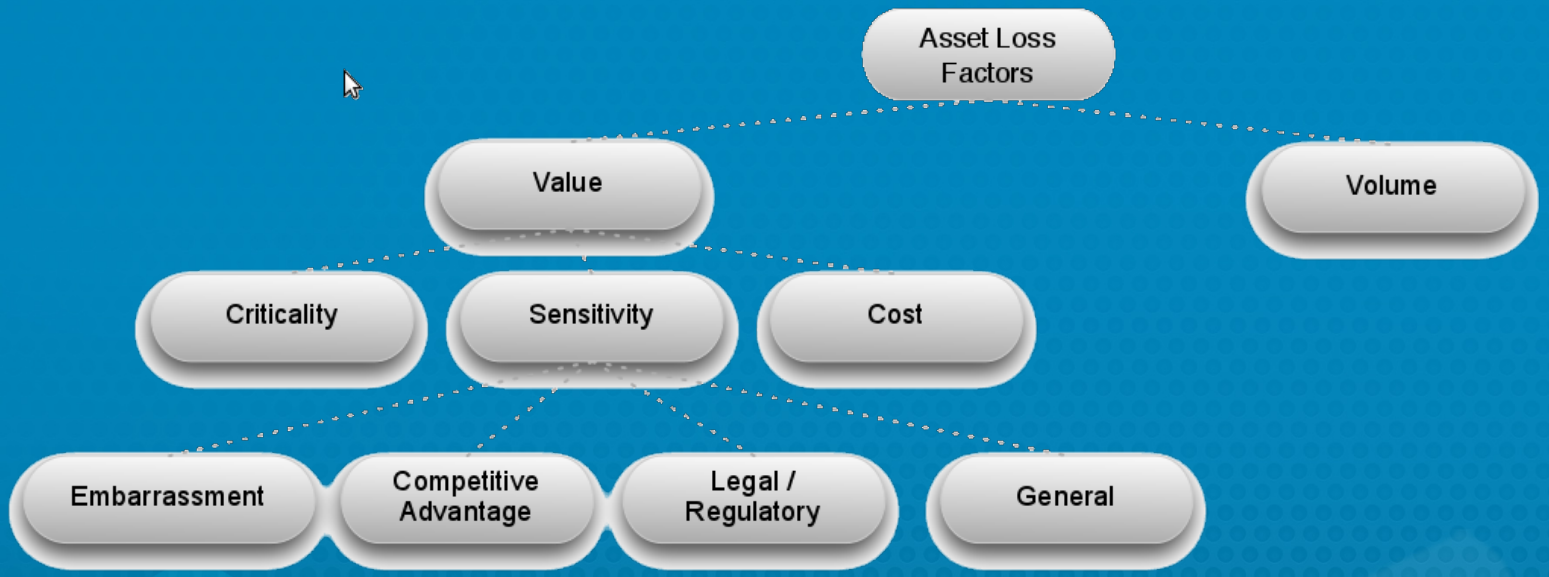
- You probably already have a lot of this information in various forms – CMDBs, directories, agent scan info, server setup logs, etc
- You can extract the data in specific forms and then push it to the analytic tools that need it



- OR you can put everything in a Big Data repository and then bring your analytics to the data



More formally…



Regardless of implementation (Hadoop or Excel) the goals are:

1. Level of investment to protect a given asset should be commensurate with asset value (think of this as **insurance**)
2. Provide inputs to analytics to improve accuracy and prioritization of alerts

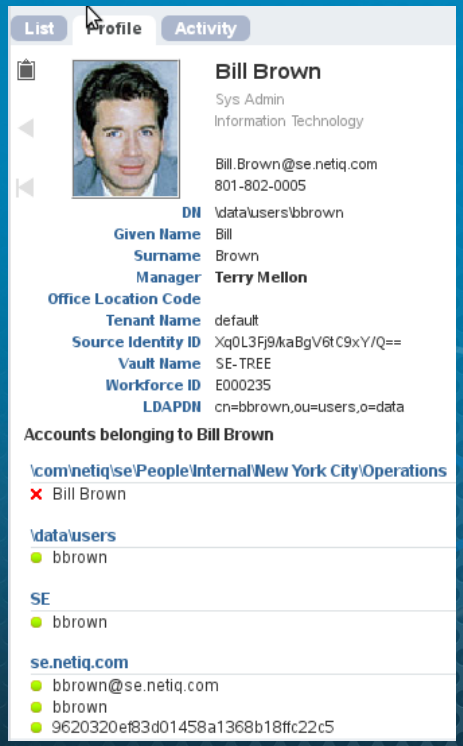
Step 3: Establish Identity Context

- Share Identity context with analytic tools: establish who, what, where
- Start with basic information like contact info, name, location
- Link resources to describe dependencies and relationships: accounts with a person, hosts with a service
- Can extend to things like reputation, sentiment, etc as you get more sophisticated

"On the Internet, nobody knows you're a dog."

Share Identity Context With Monitoring

tgMonth="05" tgHour="11" tgDay="11" tgMinute="42" EC="540" C="2" CS="Logon\/Logoff" L="Security" IS="LMURPHY ,TXDOT1 ,(0x15,0xE88A0488) ,3,Kerberos ,Kerberos , ,{cd7b463a-726e-1aec-4fd5-dabe7dc0231e} ,-,- ,- ,- ,- ,144.45.138.69 ,1099" SN="Security" RN="446108" XM="Successful Network Logon: User Name: BBROWN Domain: TXDOT1 Logon ID: (0x15,0xE88A0488) Logon Type: 3 Logon Process: Kerberos Authentication Package: Kerberos Workstation Name: Logon GUID: {cd7b463a-726e-1aec-4fd5-dabe7dc0231e} Caller User Name: - Caller Domain: - Caller Logon ID: - Caller Process ID: - Transited Services: - Source Network Address: 144.45.138.69 Source Port: 1099 " tgSecond="12" U="TXDOT1\\BBROWN" T="Audit Success" ET="4" this="event" CN="HOU-DC" EI="540" tgYear="2014“



Authentication

March 11, 2014

11:42:12 EST

IP: 144.45.138.69
HN: TXDOT1
DEPT: Finance
Loc: Texas Data Center
Owner: Bill Brown

IP: 144.45.138.69
HN: TXDOT1
DEPT: Finance
Loc: Texas Data Center
Owner: Bill Brown

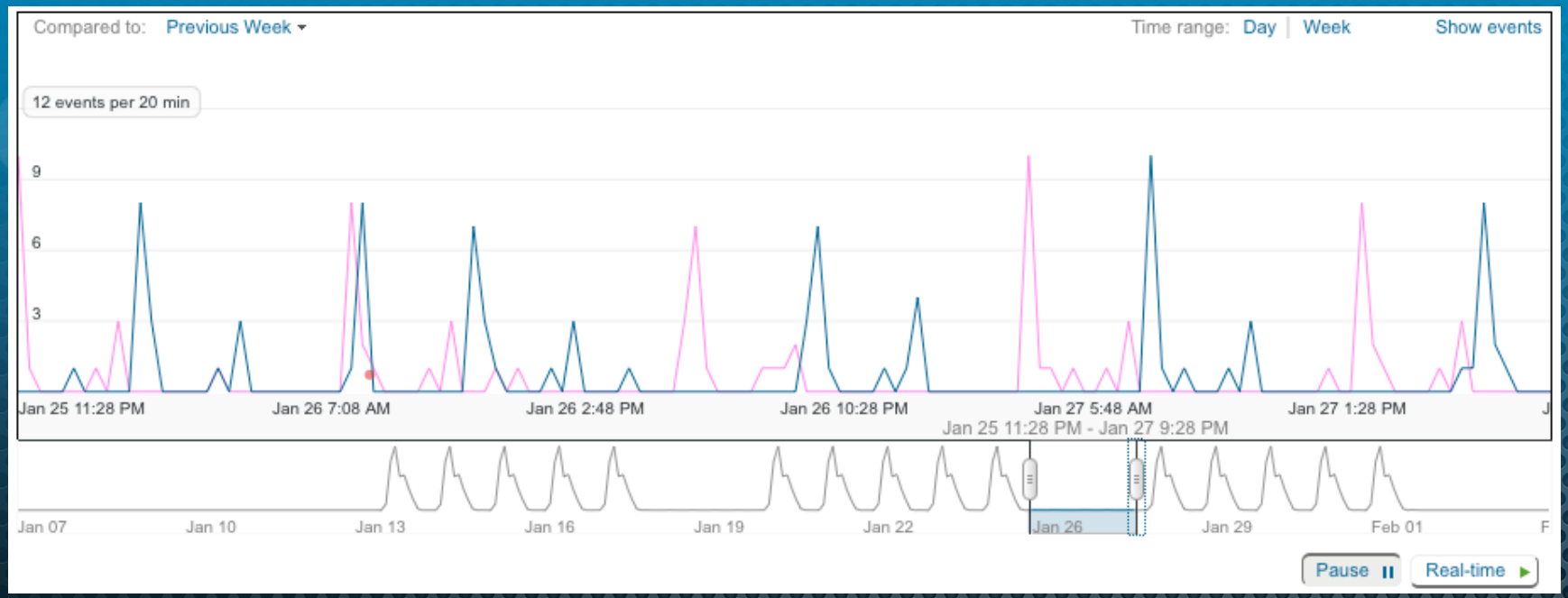
Who

What/When

Where

Step 4: Establish a Baseline

- Understand normal user, host, and service activity
- Leverage this to look for anomalies—changes in behavior
- Use monitoring to compare expected usage against actual usage (e.g. role attestation)



Step 5: Take it To the Next Level

- **WHERE APPROPRIATE,** deploy stronger and more granular access/detection controls to protect your high-value assets
- Take the time to tune and enhance auditing and detection systems – there is no magic bullet as all environments are different

Step 6 to ∞: Keep Improving!

- Invest in technologies, processes, and people to improve detection and research capabilities
- Refine and tune content continuously – analytics, signatures, reports, etc
- Learn from your mistakes!

NetIQ Can Help

Security & Compliance

- Manage and audit user entitlements
- Track privileged user activity
- Protect the integrity of key systems and files
- Monitor access to sensitive information
- Simplify compliance reporting

Identity & Access

- User Provisioning Lifecycle Management
- Centralize Unix account management through Active Directory
- Reduce number of privileged users
- Secure delegated administration
- Windows and Exchange migration

Performance & Availability

- Monitor and manage heterogeneous environments including custom applications
- IT Service validation and end-user performance monitoring
- Dynamic provisioning of large-scale monitoring with exceptions
- Functional and hierarchical incident escalation
- Deliver and manage differentiated service levels

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