


## **Immediately Address IT Access Compliance Challenges with These Techniques, Using Tools You Already Have**

Active Learning on how to Deter and Detect  
Patient Privacy Violations  
and Data Breaches by Insiders

Alan Norquist & John Vastano  
Veriphys, Inc.



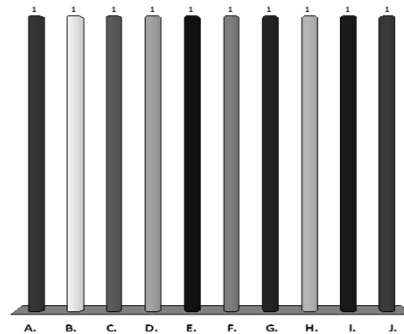
### Agenda: IT Compliance Deters and Detects Insider Breaches

- What is IT Access Compliance?
- Insiders more dangerous than outside hackers
  - Insiders = Employees, Contractors, 3<sup>rd</sup> Parties, Providers
- Characteristics of insider theft and privacy violations
- Why insiders bigger legal issue than hackers or lost/stolen hardware
- How IT access compliance can do what traditional IT security can't
- Practical approaches to IT access compliance you can use immediately

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## Survey - Your Organization's Focus?

- A. Healthcare
- B. Insurance
- C. Pharma
- D. Medical Devices
- E. Legal Services
- F. Government
- G. Other
- H. Other/All



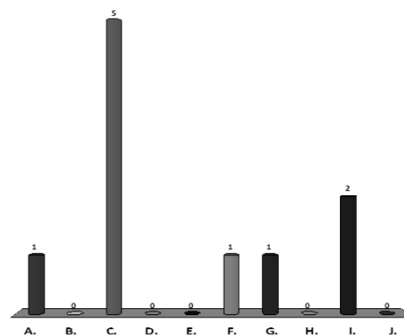
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## Survey - Your Functional Area?

- A. Audit
- B. Compliance
- C. Compliance & Ethics
- D. Ethics
- E. Human Resources
- F. Info Technology (IT)
- G. Legal
- H. Privacy
- I. Risk Management
- J. Other/All



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## IT Access Compliance

- Only have access rights as required to achieve job objectives
  - user access to systems and applications is reviewed on a periodic basis.
  
- Only act on data as required to achieve job objectives
  - regularly review records of information system activity

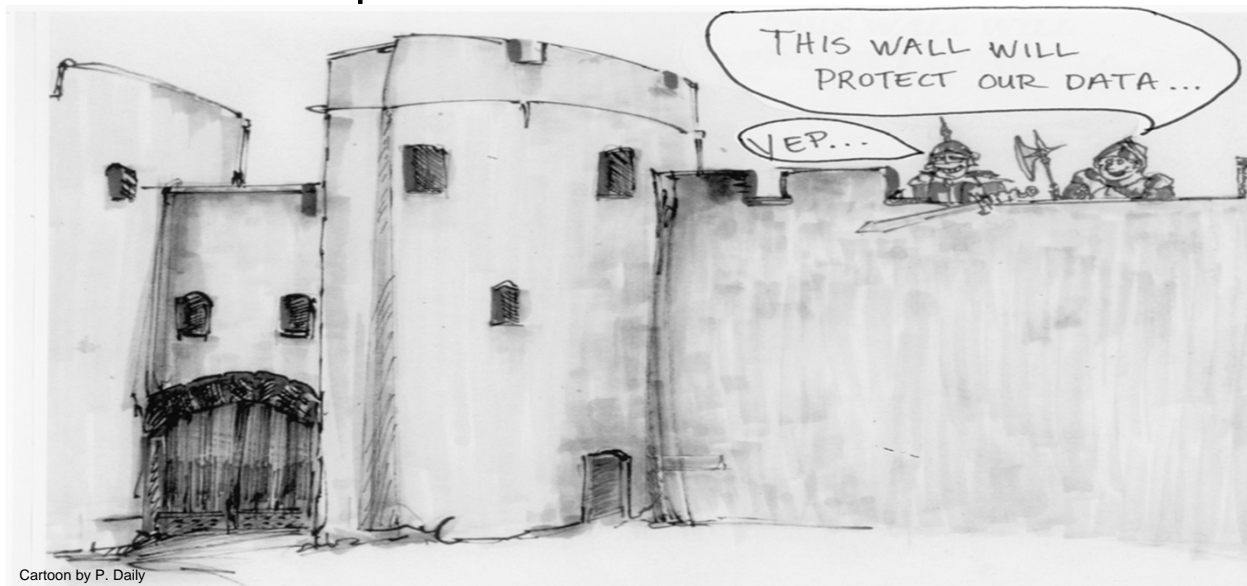
Insider = Employee, Contractor, Provider, 3<sup>rd</sup> Party or Anyone with Valid Credentials (Username and Password)  
including hackers with stolen credentials

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## You Can Keep Out the Hackers...



Cartoon by P. Daily

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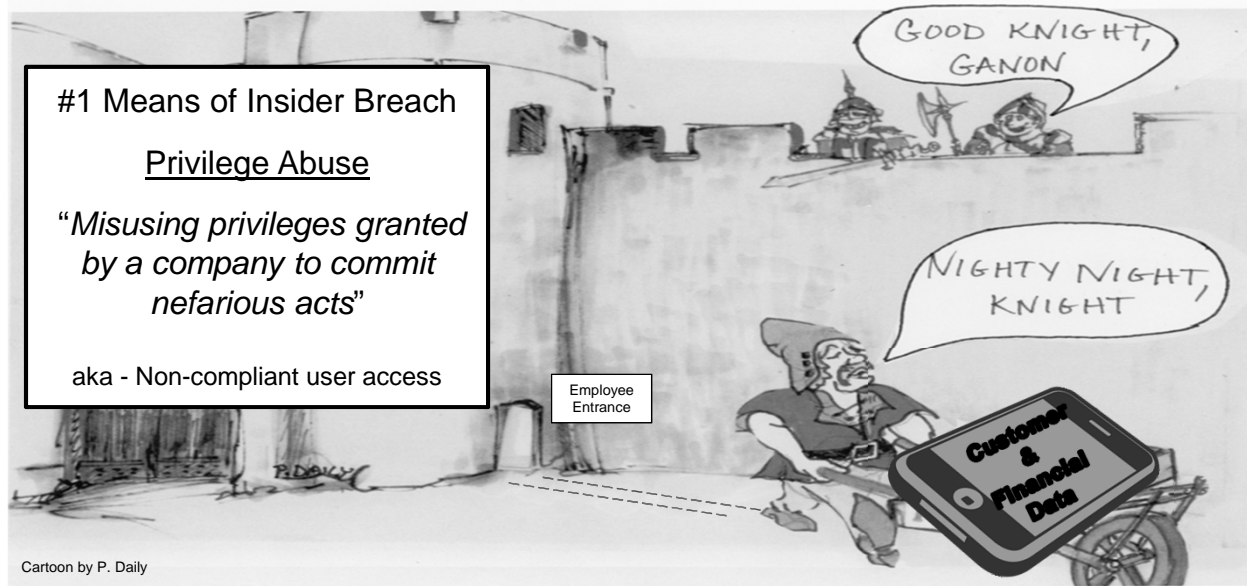
## But Not Employees, Contractors, Providers, etc.

### #1 Means of Insider Breach

#### Privilege Abuse

*"Misusing privileges granted by a company to commit nefarious acts"*

aka - Non-compliant user access



Cartoon by P. Daily

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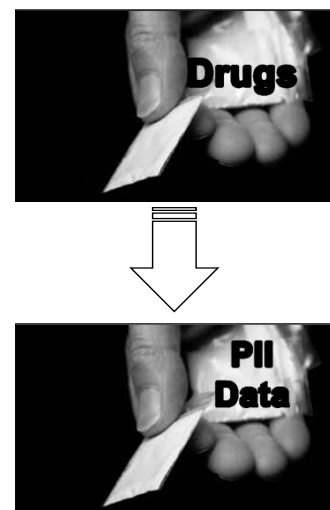
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## Selling Data Instead of Drugs?

### Quotes from FBI Press Release

- "A confidential source (CS) initially approached [criminal] and inquired about purchasing narcotics.
- [Criminal] told the CS that he did not have any narcotics but that he did have personal identity information (PII) that he was willing to sell to the CS....
- [Criminal] provided the CS with specific instructions on what information to enter into the web pages of the Internet-based tax services to obtain a tax refund.
- An examination of the PII revealed that it was from a medical services provider."



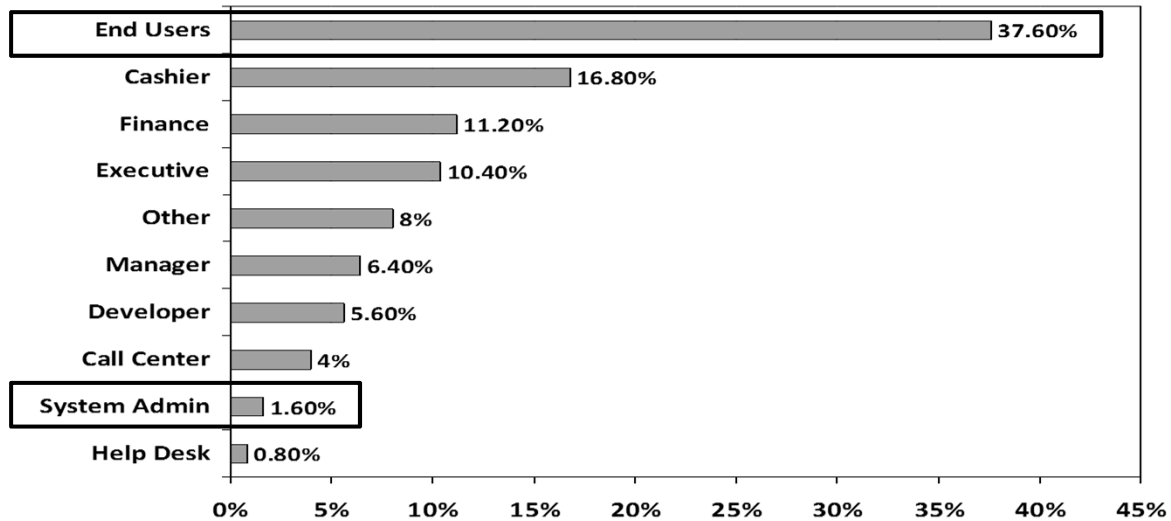
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## Who Commits Insider Thefts via Privileged Abuse

(Verizon 2015)



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## Data Theft via Privilege Abuse by Insiders

- Months and Years Before Discovered
  - 31.25% - stole for months
  - 18.75% - stole for years (source: Verizon)
- No Technical Skills Required
  - Already issued logins and passwords
- Walk Out of Your Organization with Stolen Data on Phone
  - No need to email or upload data to the cloud
  - Just take a photo on smart phone and walk out of the building
  - Print out or e-mail stolen data from home



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## Hackers vs. Privilege Abuse by Insiders – “Injury in Fact”

### ■ Hacker Steals Patient Data

- ☐ Did customer suffer “injury in fact”?
- ☐ Cases dismissed due to lack of “injury in fact”
  - No clear connection between data theft and identity theft



### ■ Employee Steals Data via Privilege Abuse

- ☐ Local Law Enforcement Bust Local Identity Theft Ring

*“Among the paperwork were computer screen-shot printouts displaying patients’ personal information from a local hospital” – indictment*

- ☐ Did patient suffer “injury in fact”?

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## Stolen/Lost Computer vs Insider Theft - “Injury in Fact”

### ■ \$4 Billion Lawsuit against Healthcare Org.

- ☐ Computer with PHI stolen
- ☐ Dismissed due to lack of “injury in fact”
  - “No proof unauthorized person accessed stolen material.”

Patient Hospital Screenshots



### ■ Lawsuit - Insider Theft for Identity Theft Ring

- ☐ Police find hospital data and credit statements
- ☐ Would this be “proof unauthorized person accessed stolen material”?
- ☐ Would suit be dismissed?

Fraudulent Credit Card Statement



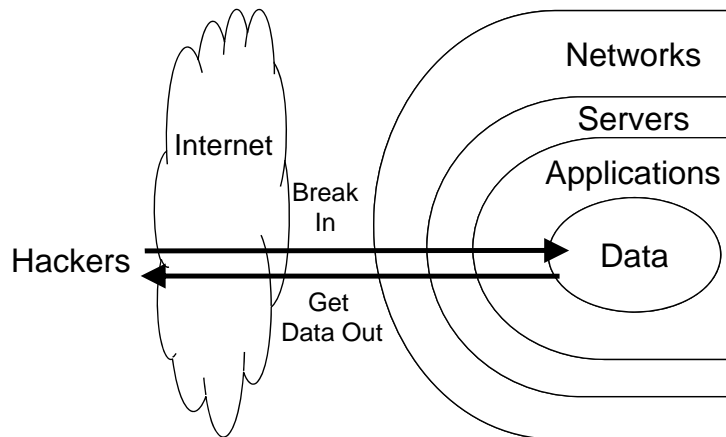
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## Traditional IT Security is for Outsiders/Hackers

- Focus on the network and not designed for insider privilege abuse



### IT Security Technology

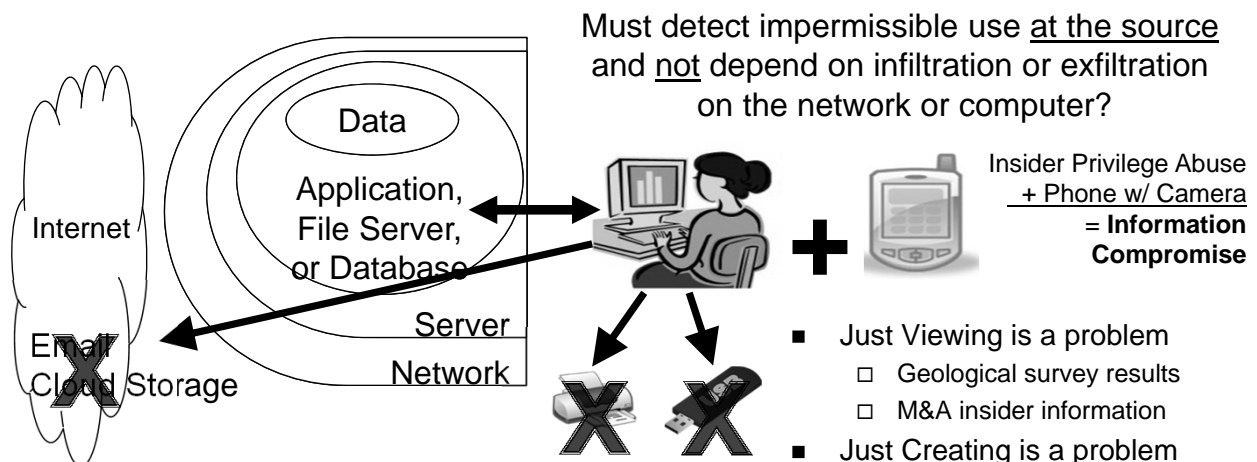
- Data Loss Protection (DLP)
- Security Event Mgmt (SEM/SIEM)
- Firewalls
- Intrusion Prevention (IDS/IPS)
- Security Intelligence
- Anti-Phishing
- Anti-Virus
- Anti-Malware

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## Focusing on Exfiltration is Insufficient



- Just Viewing is a problem
  - Geological survey results
  - M&A insider information
- Just Creating is a problem
  - Fraudulent vendors
- Just Altering is a problem
  - Company financials

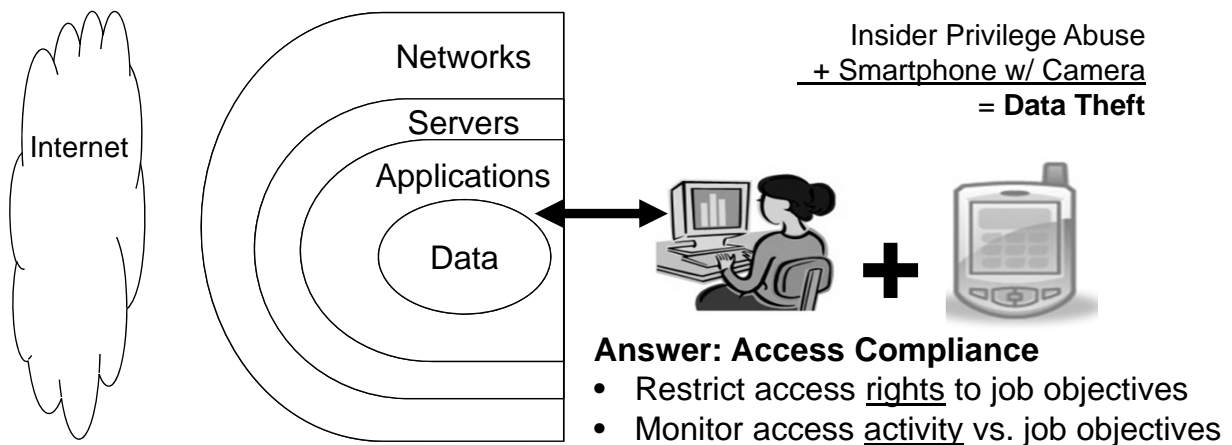
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## Access Compliance is for Data Breach by Insiders

- Addresses privilege abuse of applications and data

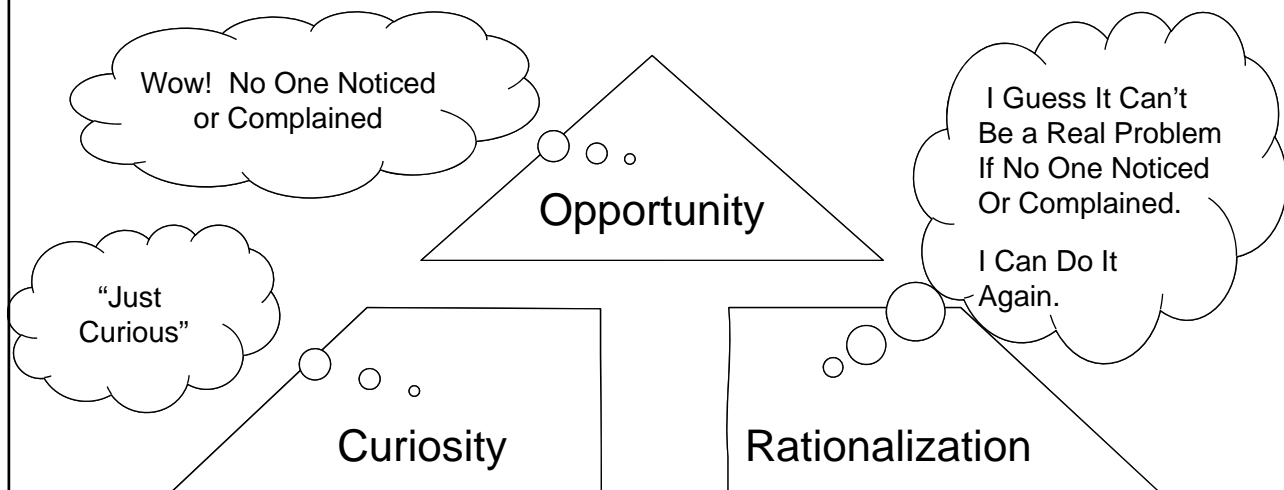


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## Fraud Triangle, Privacy Breach & Access Non-Compliance



*Not Being Caught for Privacy Breach Emboldens Employee Identity Theft*

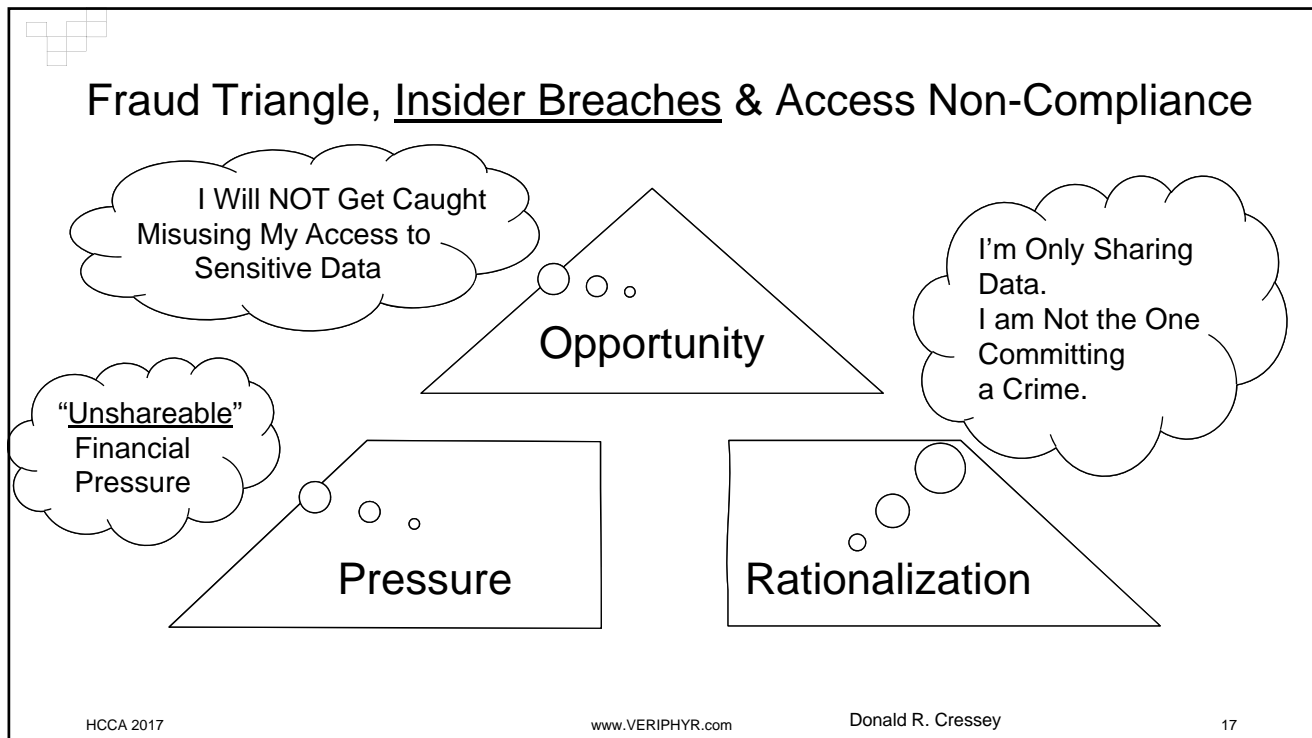
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Donald R. Cressey

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## IT Access Compliance

- Only have access rights as required to achieve job objectives
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- Only act on data as required to achieve job objectives
  - regularly review records of information system activity

Insider = Employee, Contractor, Provider, 3<sup>rd</sup> Party or Anyone with Valid Credentials (Username and Password) including hackers with stolen credentials

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## Detect Malicious Insiders by Understanding Compliant Use

To Detect  
**Malicious Access & Use**

Access Data or  
Take Actions  
**OUTSIDE job objectives**

=!

Understand  
**Compliant Access & Use**

Access ONLY the Data and  
Take ONLY the Action  
**required for job objectives**

Key - Use true peer groups of workers with similar job objectives  
- Can't use peer groups based on title and departments or other static label

Group workers by "job"

If workers access or activities are anomalous for the "job"

Then anomalous actions are impermissible use

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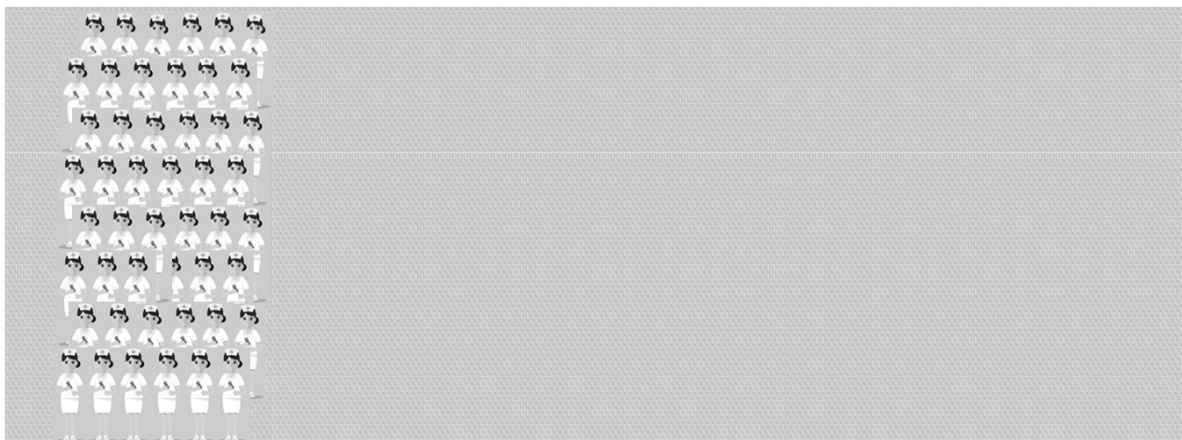
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## Worker Jobs – Not Titles and Departments

All Outpatient Nurses are NOT All the Same!



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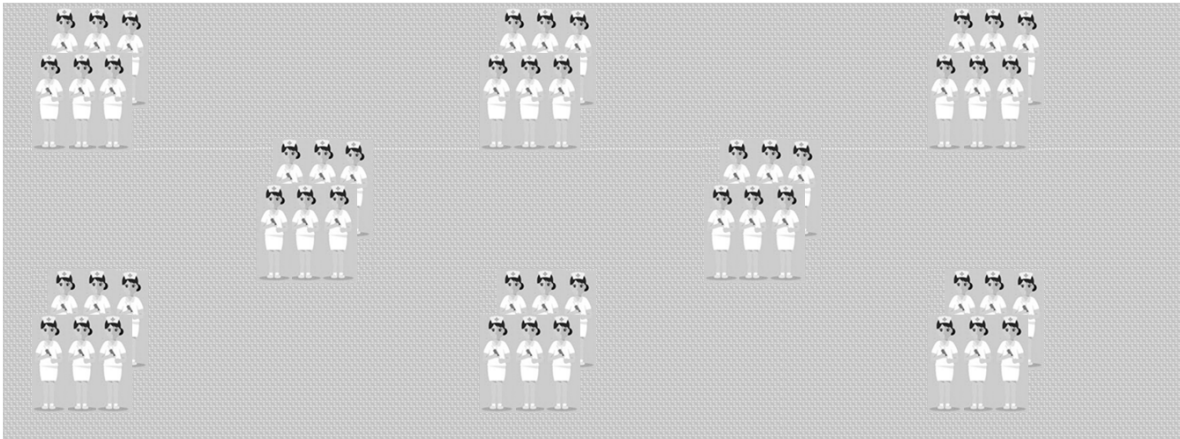
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## Worker Jobs – Not Titles and Departments

All Outpatient Nurses are NOT All the Same!

Different Jobs Reflected in Differences in What Activities are Permissible Use



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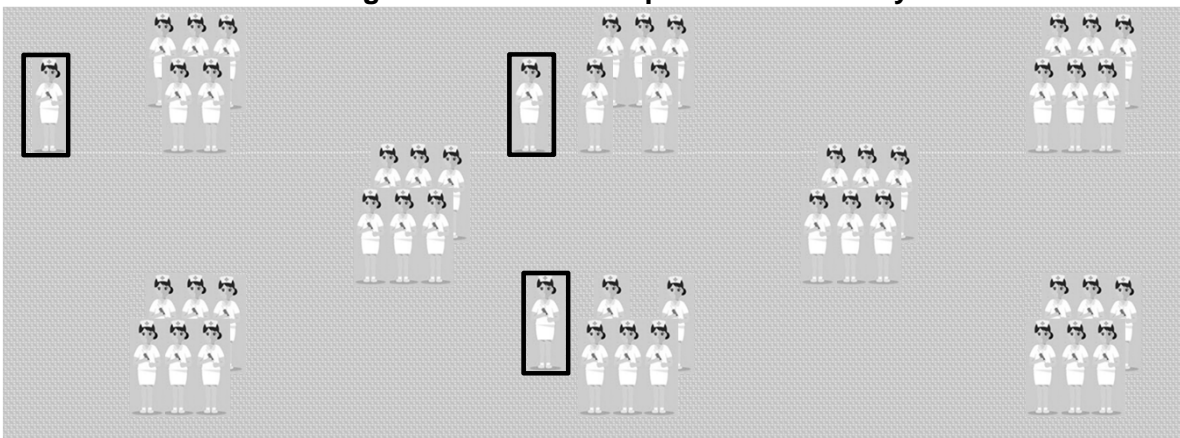
21

## Worker Jobs – Not Titles and Departments

All Outpatient Nurses are NOT All the Same!

Different Jobs Reflected in Differences in What Activities are Permissible Use

**Understanding “Jobs” Reveals Impermissible Use by Nurses**



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## IT Compliance to Proactively Detect Privacy Violations and Data Theft

- Employees Doing Similar Jobs Behave Similarly
  - Compare Employee Access Rights to Job Peers to Find Anomalies
  - Compare Employee Activity to Job Peers to Find Anomalies
    - Uses Existing Application Logs of Employee Access to Identity Data
- Investigate Anomalies with Managers and Employee
  - Employees Know They are Being Effectively Monitored
  - Deters Identity Theft (Reducing "Opportunity" in Triangle)
  - Detect Identity Theft in Early Stages
    - Intervene Before Employee Breaks the Law

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## Walk through examples, then hands on

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### Attestation of User Access Rights

Manager: ZEBRA,ZACKARY

Keep	Drop	Worker	Department	Title	Application	Access Level
<input type="checkbox"/>	<input type="checkbox"/>	ALFA ALICE	Inpatient	RN	BILLING	2
<input type="checkbox"/>	<input type="checkbox"/>				Data Warehouse	1
<input type="checkbox"/>	<input type="checkbox"/>				EHR	2
<input type="checkbox"/>	<input type="checkbox"/>				FINANCE	4
<input type="checkbox"/>	<input type="checkbox"/>				HR	4
<input type="checkbox"/>	<input type="checkbox"/>				Imaging	1
<input type="checkbox"/>	<input type="checkbox"/>				Pediatrics	1
<input type="checkbox"/>	<input type="checkbox"/>				Scheduling	3
<input type="checkbox"/>	<input type="checkbox"/>	ALPHA,ALPHA	Inpatient	RN	EHR	4
<input type="checkbox"/>	<input type="checkbox"/>				Imaging	5
<input type="checkbox"/>	<input type="checkbox"/>				Pediatrics	6
<input type="checkbox"/>	<input type="checkbox"/>				Scheduling	4
<input type="checkbox"/>	<input type="checkbox"/>	BETA,BETA	Inpatient	RN	EHR	4
<input type="checkbox"/>	<input type="checkbox"/>				Imaging	5
<input type="checkbox"/>	<input type="checkbox"/>				Pediatrics	6
<input type="checkbox"/>	<input type="checkbox"/>				Scheduling	4
<input type="checkbox"/>	<input type="checkbox"/>	BRAVO, BETTY	Inpatient	RN	BILLING	3
<input type="checkbox"/>	<input type="checkbox"/>				EHR	3
<input type="checkbox"/>	<input type="checkbox"/>				FINANCE	5
<input type="checkbox"/>	<input type="checkbox"/>				HR	5
<input type="checkbox"/>	<input type="checkbox"/>				Imaging	1
<input type="checkbox"/>	<input type="checkbox"/>				Pediatrics	2
<input type="checkbox"/>	<input type="checkbox"/>				Scheduling	4
<input type="checkbox"/>	<input type="checkbox"/>	CHARLIE, CHARLIE	Inpatient	RN	EHR	4
<input type="checkbox"/>	<input type="checkbox"/>				Imaging	5
<input type="checkbox"/>	<input type="checkbox"/>				Pediatrics	6
<input type="checkbox"/>	<input type="checkbox"/>				Scheduling	4

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### Access Rights Grouped by User

- What Rights are Inappropriate?
- Insufficient context for manager to make an informed decision

### Attestation of User Access Rights

Manager: ZEBRA,ZACKARY  
JO Peer Group: JOPG-01

Keep	Drop	Application	Worker	Department	Title	Access Level
<input type="checkbox"/>	<input type="checkbox"/>	BILLING	ALFA ALICE	Inpatient	RN	2
<input type="checkbox"/>	<input type="checkbox"/>		BRAVO, BETTY	Inpatient	RN	3
<input type="checkbox"/>	<input type="checkbox"/>		DELTA,DEBBIE	Inpatient	RN	3
<input type="checkbox"/>	<input type="checkbox"/>		ECHO, EDWARD	Inpatient	RN	3
<input type="checkbox"/>	<input type="checkbox"/>		FOXTROT, FRANK	Inpatient	RN	3
<input type="checkbox"/>	<input type="checkbox"/>		GAMMA, GEORGE	Inpatient	RN	3
<input type="checkbox"/>	<input type="checkbox"/>		KILO, KAREN	Inpatient	RN	3
<input type="checkbox"/>	<input type="checkbox"/>	Data Warehouse	ALFA ALICE	Inpatient	RN	1
<input type="checkbox"/>	<input type="checkbox"/>	EHR	ALFA ALICE	Inpatient	RN	2
<input type="checkbox"/>	<input type="checkbox"/>		BRAVO, BETTY	Inpatient	RN	3
<input type="checkbox"/>	<input type="checkbox"/>		DELTA,DEBBIE	Inpatient	RN	3
<input type="checkbox"/>	<input type="checkbox"/>		ECHO, EDWARD	Inpatient	RN	3
<input type="checkbox"/>	<input type="checkbox"/>		FOXTROT, FRANK	Inpatient	RN	3
<input type="checkbox"/>	<input type="checkbox"/>		GAMMA, GEORGE	Inpatient	RN	3
<input type="checkbox"/>	<input type="checkbox"/>		KILO, KAREN	Inpatient	RN	3
<input type="checkbox"/>	<input type="checkbox"/>	FINANCE	ALFA ALICE	Inpatient	RN	4
<input type="checkbox"/>	<input type="checkbox"/>		BRAVO, BETTY	Inpatient	RN	5
<input type="checkbox"/>	<input type="checkbox"/>		DELTA,DEBBIE	Inpatient	RN	5
<input type="checkbox"/>	<input type="checkbox"/>		ECHO, EDWARD	Inpatient	RN	5
<input type="checkbox"/>	<input type="checkbox"/>		FOXTROT, FRANK	Inpatient	RN	5
<input type="checkbox"/>	<input type="checkbox"/>		GAMMA, GEORGE	Inpatient	RN	5
<input type="checkbox"/>	<input type="checkbox"/>		KILO, KAREN	Inpatient	RN	5
<input type="checkbox"/>	<input type="checkbox"/>	HR	ALFA ALICE	Inpatient	RN	4
<input type="checkbox"/>	<input type="checkbox"/>		BRAVO, BETTY	Inpatient	RN	5
<input type="checkbox"/>	<input type="checkbox"/>		DELTA,DEBBIE	Inpatient	RN	5
<input type="checkbox"/>	<input type="checkbox"/>		ECHO, EDWARD	Inpatient	RN	5


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### Access Rights Grouped by Job Objective Peer Groups and by Application


Groups of workers who have the same job objective

Truly similar as opposed to grouping by title or department

- What Rights are Inappropriate?

 <b>User Access Rights Review</b>											
<b>Access Rights Grouped by User</b>											
Manager ZEBRA,ZACKARY Application (All) JOGP (All)											
Are they all true peers? What is inappropriate?											
Access Level				Applications							
Blank	Worker	Department	Title	Scheduling	Pediatrics	Imaging	HR	FINANCE	EHR	Data Warehouse	BILLING
(blank)	ALFA ALICE	Inpatient	RN	3	1	1	4	4	2	1	2
	ALPHA,ALPHA	Inpatient	RN	4	6	5			4		
	BETA,BETA	Inpatient	RN	4	6	5			4		
	BRAVO, BETTY	Inpatient	RN	4	2	1	5	5	3		3
	CHARLIE, CHARLIE	Inpatient	RN	4	6	5			4		
	DELTA,DEBBIE	Inpatient	RN	4	2	2	5	5	3		3
	DELTA,DELTA	Inpatient	RN	4	6	5			4		
	ECHO, EDWARD	Inpatient	RN	4	2	2	5	5	3		3
	ECHO,ECHO	Inpatient	RN	4	6	5			4		
	FOXTROT, FRANK	Inpatient	RN	4	2	2	5	5	3		3
	FOXTROT,FOXTROT	Inpatient	RN	4	6	4			3		
	GAMMA, GEORGE	Inpatient	RN	4	2	2	5	5	3		3
	GOLF,GOLF	Inpatient	RN		6	5			4		
	KILO, KAREN	Inpatient	RN	4	2	2	4	5	3		3

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 <b>User Access Rights Review</b>											
<b>Access Rights Grouped by Job Objective Peer Groups</b>											
Manager ZEBRA,ZACKARY Application (All) JOGP (All)											
With true peers the inappropriate access is obvious											
Access Level				Applications							
JOGP	Worker	Department	Title	Scheduling	Pediatrics	Imaging	HR	FINANCE	EHR	Data Warehouse	BILLING
JOGP-01	ALFA ALICE	Inpatient	RN	3	1	1	4	4	2	1	2
	BRAVO, BETTY	Inpatient	RN	4	2	1	5	5	3		3
	DELTA,DEBBIE	Inpatient	RN	4	2	2	5	5	3		3
	ECHO, EDWARD	Inpatient	RN	4	2	2	5	5	3		3
	FOXTROT, FRANK	Inpatient	RN	4	2	2	5	5	3		3
	GAMMA, GEORGE	Inpatient	RN	4	2	2	5	5	3		3
	KILO, KAREN	Inpatient	RN	4	2	2	4	5	3		3
JOGP-02	ALPHA,ALPHA	Inpatient	RN	4	6	5			4		
	BETA,BETA	Inpatient	RN	4	6	5			4		
	CHARLIE, CHARLIE	Inpatient	RN	4	6	5			4		
	DELTA,DELTA	Inpatient	RN	4	6	5			4		
	ECHO,ECHO	Inpatient	RN	4	6	5			4		
	FOXTROT,FOXTROT	Inpatient	RN	4	6	4			3		
	GOLF,GOLF	Inpatient	RN		6	5			4		

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## User Activity by Title and Department


### Is Adam Boy Acting Anomalously?

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## User Activity by Job Objective Peer Groups

There are clear differences between JOPG

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# Activity for Single Job Objective Peer Groups

## Is Adam Boy Acting Anomalously?

### Employee, Contractor, and Provider Access to Patient Data


Manager	Delta, Charlie	Y
Department	Inpatient	Y
Title	RN	Y
JOPG	JOPG-04	Y

Anomaly Key

Unique	
Rare	
Common	
Core	

Worker	Department	Title	Activity-A-10	Activity-A-11	Activity-A-12	Activity-A-13	Activity-A-17	Activity-A-19	Activity-A-21	Activity-A-24	Activity-A-26	Activity-A-28	Activity-A-30	Activity-A-33	Activity-A-35	Activity-A-37	Activity-A-40	Activity-A-42	Activity-A-44	Activity-A-47	Activity-A-49	Activity-A-51	Activity-A-53	Activity-A-56	Activity-A-58	Activity-A-60	Activity-A-63	Activity-A-65	Activity-A-67	Activity-A-70	Activity-A-72	Activity-A-74	Activity-A-76	
JOPG-04																																		
Adam,Boy	Inpatient	RN	461	286	5	6	3		21	47	57	28	34		25	39	39	40	36	27	31	42	62	63	80	35	58	44	42	53	41	15	62	
Charlie,David	Inpatient	RN	484	254						61	54	36	22	32	39	37	43	15	20	22	57	49		62	40	61		53	52		34	34	14	58
Edward, Frank	Inpatient	RN	450						28	43	57	40	32	46	37	23	51	19	19	22	57	49		70	71	49	41	47	36	35	29	10	51	
George, Henry	Inpatient	RN	472	291				18		41		49	42	57	33	10	49	19	25	37	40	42	45	69	64	38			50	34	25	10	49	
Ida, John	Inpatient	RN	478	257				18	28		71	41				14	53	35	36	23	52	61	63	44	51	25	41	54	27	60	33	28	47	
Kink, Lincoln	Inpatient	RN	925	541				12	67	57	123	70	46	98	88	44	82	64	54	45	116	125	117	96	55	28	82	84	74	105	64	43	92	
Mary, Nancy	Inpatient	RN	451	288						48	75		23		37	18	46	31	19	38	57	43	70	44		45	33	39	43	57	38	18	63	

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# Live, Step-by-Step Tutorial of Techniques!

- Using Tools You Probably Already Know and Have
- Using Activity Logs and Identity Data Your Systems Already Produce
- Instructions and Examples
- Discover Identity Theft and Privacy Breach Activity

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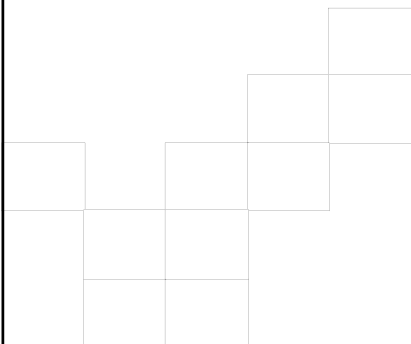
## Hands-on Workshop

- Time for participants to use their own PC and Excel
- Work through real access compliance challenges
  - Identify inappropriate access rights
  - Identify patient privacy violations by insiders
  - Identify data thefts by insiders

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**Immediately Address  
IT Access Compliance Challenges  
with These Techniques,  
Using Tools You Already Have**

Alan Norquist & John Vastano

[anorquist@veriphys.com](mailto:anorquist@veriphys.com)

[jvastano@veriphys.com](mailto:jvastano@veriphys.com)

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