Where to start with risk?

1. Phishing & Social Engineering

2. User Awareness, Education, Training

Ref: https://er.educause.edu/articles/2017/1/information-security-risky-business

Infosec Awareness & Education Program

- Faculty, students, admin and technical staff.
- Phishing test campaigns
- Social media, website communications, Managing Digital Footprint presentation
- Initiate and participate in the October cyber-security events.
- securitymatters.utoronto.ca

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Devices: software maintenance, loss of device

Data Protection & Hygiene: sharing data,
working off-site

Password Management: strength, UTORid management
Info, self serve password reset:

https://www.utorid.utoronto.ca/cgi-bin/utorid/acctrecovery.pl

U of T Phish Testing Stats

Initial Tests

- Staff (with pre-awareness) fail rate: 10 - 15 %
- Staff (w/o pre-awareness) fail rate: 30 %

Subsequent Tests

- Staff fail rate: 3 - 7 %

Testing measures include checking for opening, link clicking and data entry.

Security Planner

- Advice for users delivered using a point-and-click app.
- From Citizen Lab
- Help with devices, email, social media, online shopping.
- https://securityplanner.org

Privacy and Information Security Compliance

FIPPA: www.fippa.utoronto.ca
PHIPA: www.ipc.on.ca/health/collection-use-and-disclosure-personal-health-information
CASL: fightspam.gc.ca
PCI-DSS: www.pcisecuritystandards.org/pci_security

Influencers: PIPEDA, GDPR

Aside: General Data Protection Regulation (GDPR)

- Affects data usage for EU residents *outside* of EU
- Stricter consent requirements
- Short timeline for breach reporting (72 hours)
- Right to be forgotten
- U of T implications

- More information: https://nyti.ms/2Lq0rAC

Information Security Governance at U of T

- Policy on Information Security and the Protection of Digital Assets
- Creation of Information Security Council (CIO Bo Wandschneider)
  - Co-chairs: Ron Deibert (Citizen Lab) and CISO
  - Membership made up of faculty, staff, student
  - Five WGs: Incident Response, Standards Guidelines Procedures, Education & Awareness, Risk & Compliance Metrics & Reporting, Research

http://main.its.utoronto.ca/news/newly-formed-information-security-council/

What It Means

- Clear guidance (mandated in some cases) on the design, deployment and operation of online services.
- Classification of data into categories that dictate handling.
- Increasing tendency to using services that ‘comply’ rather than build from scratch.
- Wider awareness about what to do in the event of a compromise, malware attack, or breach.

What It Doesn’t Mean

- Loss of ability to innovate.
- There will be no malware or phishing attacks or data loss.

Awareness and Education – Part 2
Faculty/Staff/Student Info

- USB storage device encryption for Windows, file/folder for MacOS
- Password Managers
- Trusted source for popular tools, utilities
- Separate browsers for banking and recreational use
- Stand-alone desktop/laptop configuration
- backups
- Collaborative effort?

Office 365

Email Attachment Sharing:

- Share with U of T faculty/staff/students, external, non-O365 users
- Don’t want to share, remove permissions or rename the file.

One Drive Sharing:

- User configuration of access to docs, view ‘who and when’ contents accessed.

- Convenient as Dropbox with more control and protection

Office 365 - Data Storage and Sharing

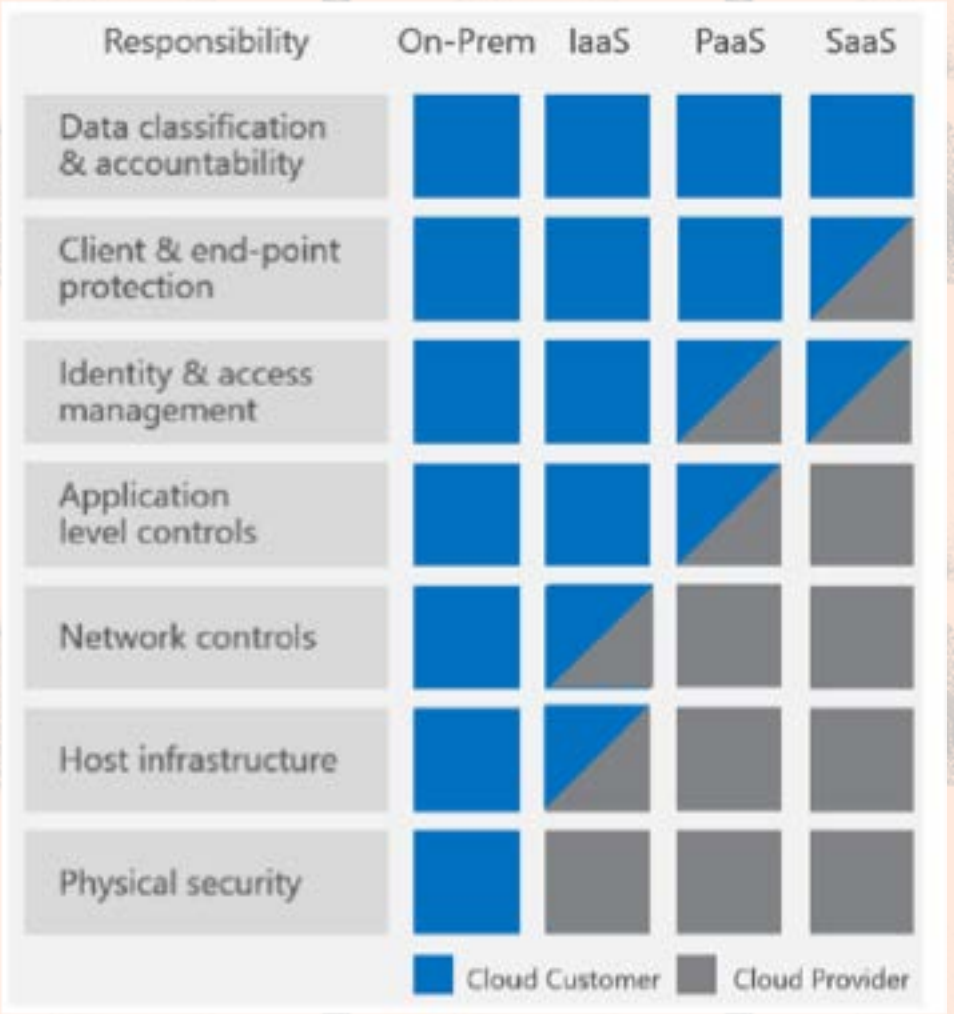
What data can I store/share on OneDrive/SharePoint/Teams?

Data Classification (provisional)	Infosec Controls	Examples
Public	Service*	Course info., research publications
Confidential	Service, access control**	PII, single person account info.
Restricted	Service, access control***	PHIPA, PCI-DSS, data aggregate

* Service: security controls concerned with system hardware, operating systems, middleware and logging/audit.
** Access Control: one/two factor authentication, user authorization
*** Access Control: two factor authentication, user authorization

Awareness and Education – Part 2
Service Architecture

- Data security management applies to both on-prem & cloud.
- Logs and audit capability
- Browsers or rich clients?
- Integration with UTORid authentication and authorization.

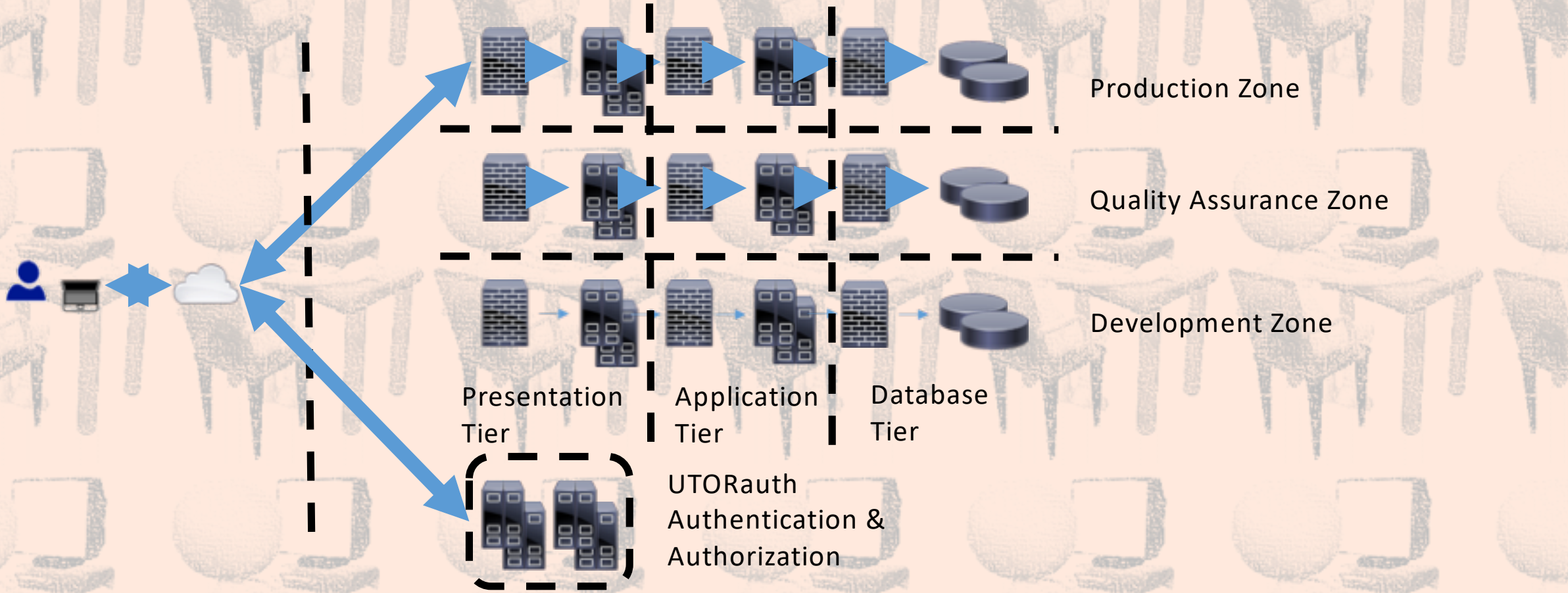


Ack: Chart from Microsoft

Architecture

- A broad topic and a key aspect in addressing information security (infosec: built in not bolted on).
- At U of T today:
  - Design or procure services with lifecycle in mind - hardware, operating system, networking, security services, middleware. EIS private cloud/systems services.
  - Sharing of enterprise data with units
  - Application software – custom or purchased?
  - Interface with authentication/authorization – UTORauth

Architecture – Getting Complex…



Web Services

- High rate of compromise: content managers (WordPress, Drupal), web development platforms (PHP, Java-Struts).
  - Cause: software versions not up-to-date, not patched, plugins obtained from questionable sources.
  - Solution: Manage professionally, use web application firewall, use deep packet inspection firewall or intrusion prevention system.

Application Development

- review security documentation for platforms.
- Follow secure coding practices eg. input validation
- Use code analysis tools eg. HP Fortify
- For web programming, OWASP Top 10.
- Check web apps on deployment and periodically using a web vulnerability scanner.

- security.admin@utoronto.ca

A little humour…

https://www.youtube.com/watch?v=Usq3SO_Fvjg

Acknowledgement to Cisco

Information Security Operations

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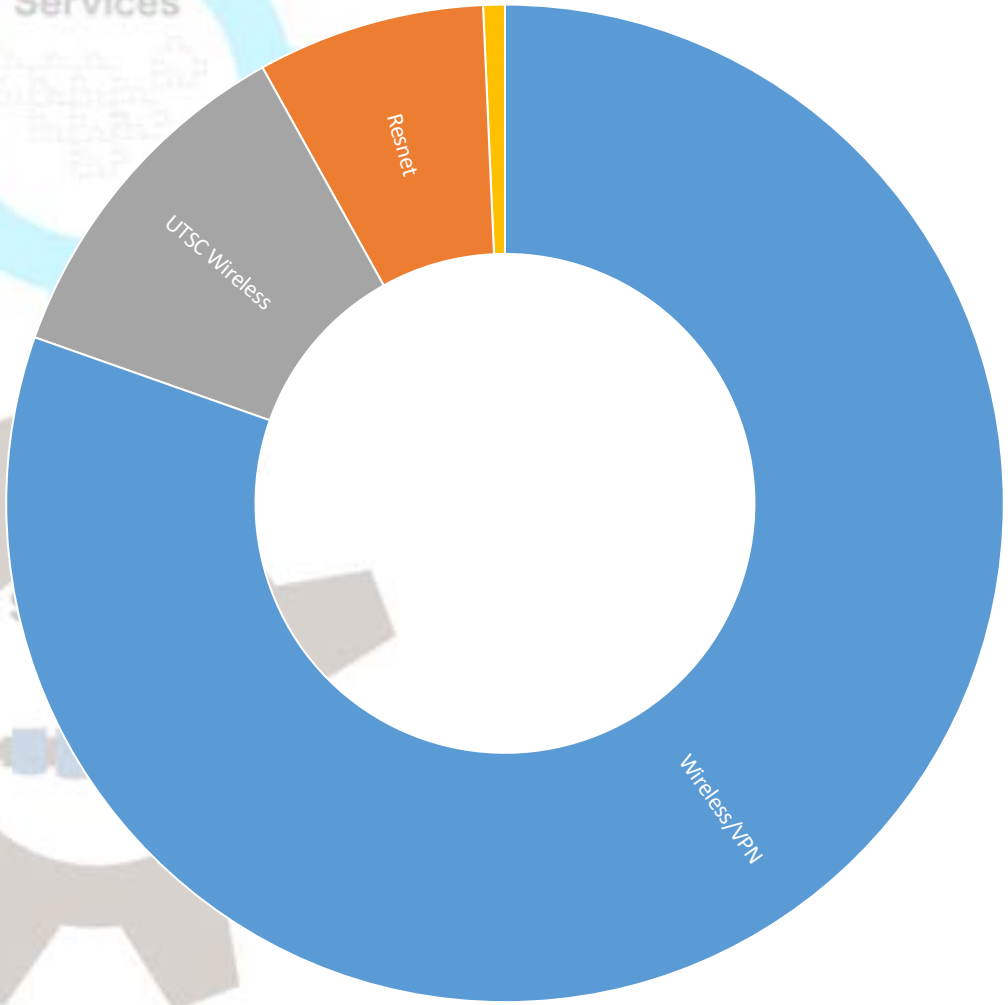
Information Security Risk Assessment

- New or existing project/service, procurement, unit assessment
- Process: gather information via questionnaires/interviews, assess and document risks and mitigations
- Deliverables: identify risks and mitigations for project owners, business managers, enhance awareness
- U of T questionnaire, HECVAT docs – have a look!
- ISEA staff can provide training

Detection, Analysis, Response

Suspicious Devices

- U of T devices detected via threat intel from outbound traffic
- Top causes: phishing, URL analysis, remote access, dynamic DNS
- Response: daily dept. IT notification
- Risk: BYOD represents majority of compromised devices.
- Mitigation: endpoint protection, network segmentation



Data: 6 months of daily measurements Mar-Sept 2017

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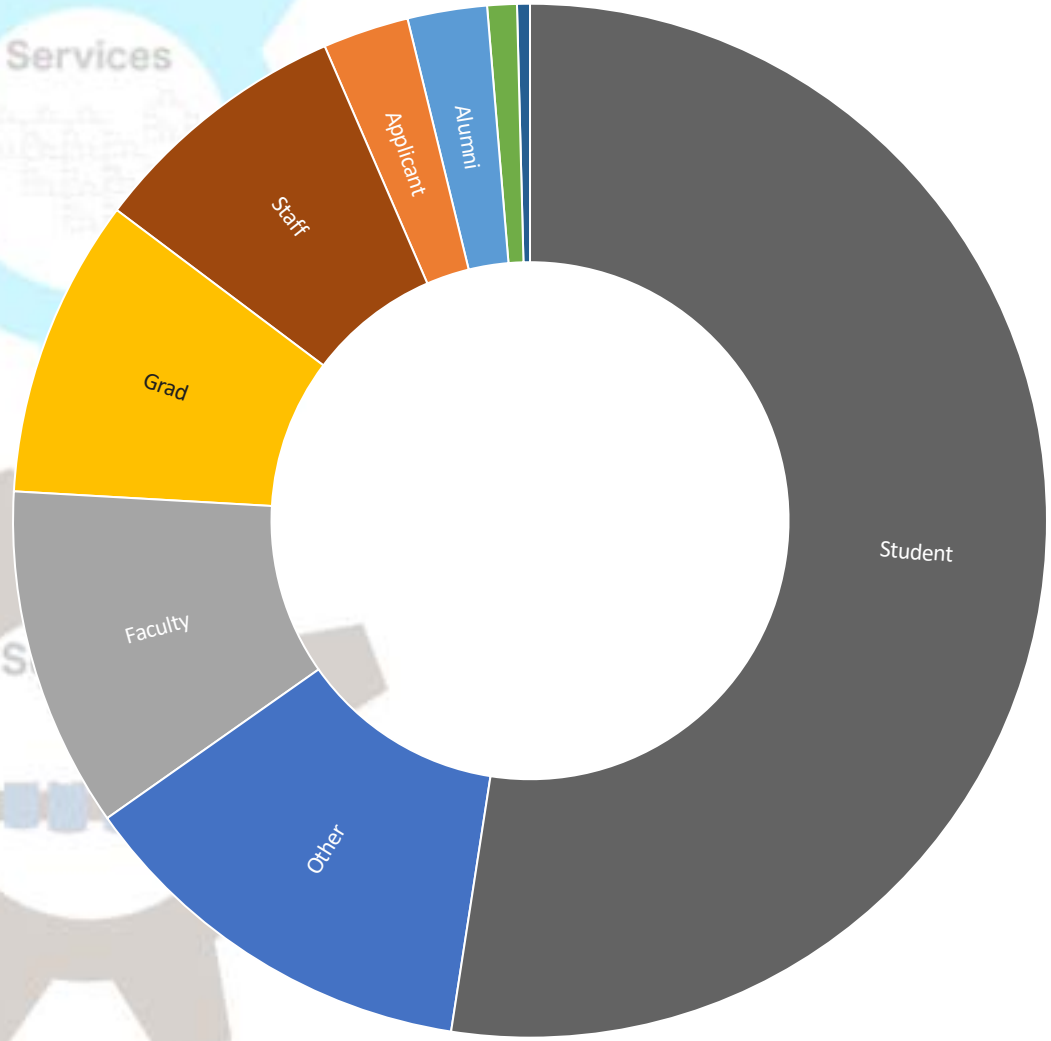
Detection, Analysis, Response

Suspicious UTORid Accounts

- Suspicious location and geo-diverse logins
- One characteristic: compromised password
- Response: ISEA prioritizes events, resets password
- Risk: Individual impact
- Mitigation: awareness/education, UTORid self-serve password reset



Data: 6 months of daily measurements Mar-Sept 2017

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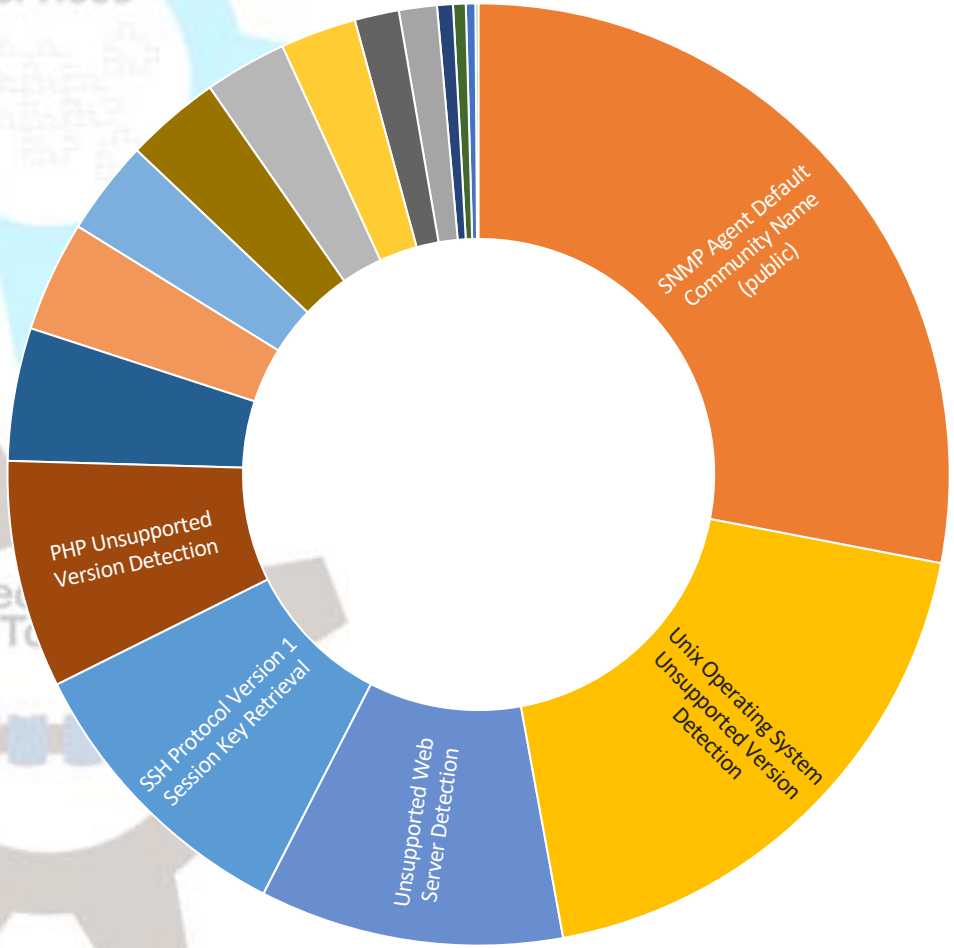
Detection, Analysis, Response

Vulnerability Detection

- Monthly network scan.
- Highest Risk Score
- Response: Tenanted reporting to depts.
- Risk: Substantial
- Mitigation: month-to-month reporting, enforcement.
- Contact: security.admin@utoronto.ca



Data: May 7, 2018 scan

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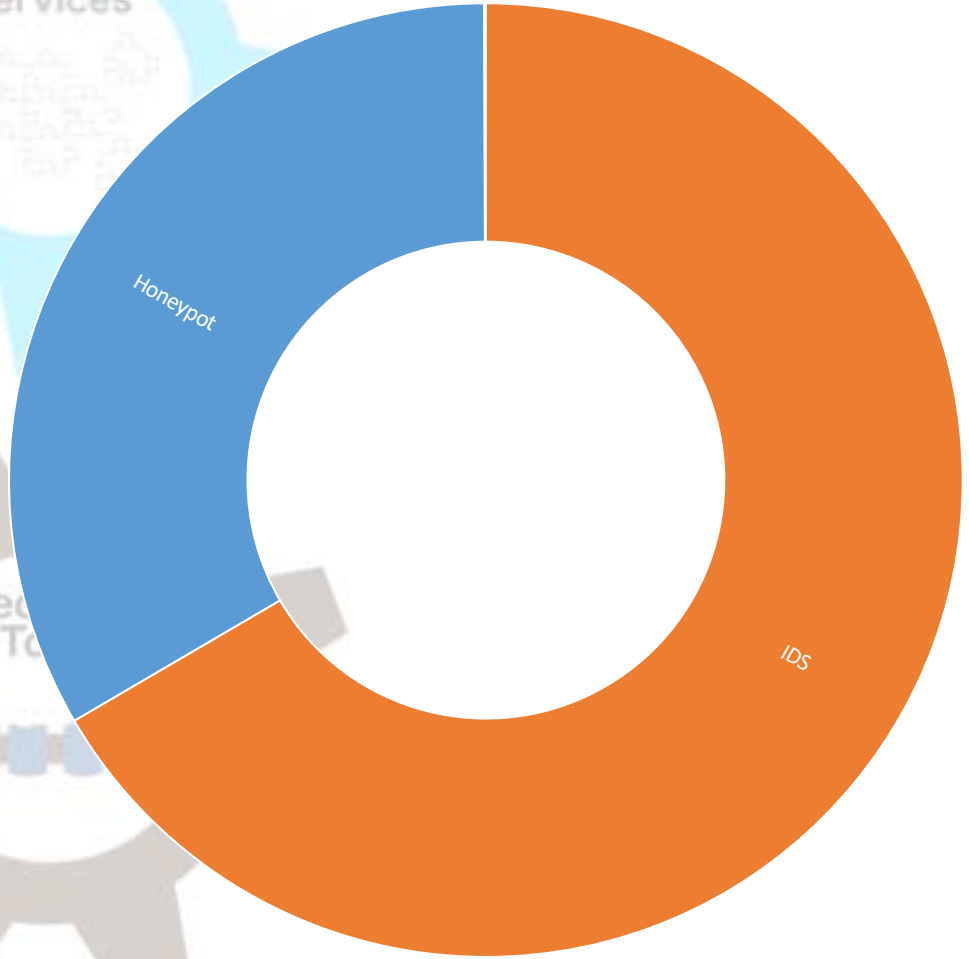
Detection, Analysis, Response

Automated Response

- High confidence access attempts 10K – 50K/day.
- Response: Automatic quarantine 1hr – 14 days.



Data: 6 months of daily measurements Mar-Sept 2017

Detection, Analysis, Response

- Security Information and Events Monitor (SIEM) is the central hub for gathering data, normalization, analytics, and reporting.
- Automation is a huge aid, expertise is needed to identify areas ripe for automation.

Priorities:

- Move from point-service to integrated analysis
- Add services, enhance analysis capability
- Add tenanting

Identity and Access Management

- UTORauth is a key source of data for infosec operations – authentication and authorization.
- Services:
  - UTORid account creation/lifecycle
  - UTORid standard and high assurance authentication (password and eToken)
  - webSSO, UTORauth attribute directory, Grouper

Identity and Access Management

Priorities:

- Improve UTORid password status: detect/update ‘old’ passwords.
- Expand use of multifactor authentication
- Add support for OAuth2, OpenID Connect

Self Serve Password Reset Enrolment:

https://www.utorid.utoronto.ca/cgi-bin/utorid/acctrecovery.pl

Enterprise Active Directory

- Primary role in UTORauth identity and access management and account synchronization with Office 365.
- Departments use the one-way-trust feature to get access to UTORid accounts and password login.
- Uptake on ‘single forest, single domain, multiple OU’ is slow.
- New technologies on the scene: InTune

Priorities:

- Review Active Directory usage/risks, impact of InTune

Thanks.

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Image acknowledgement:

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