Matching security to data threats - more can be better, but less is bad

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Agenda

- What are the threats to data
- How much of it needs to be secured
- Where do these threats come from
- Where is data accessed from
- What solutions are there today

Threats to structured data

- Raw structured data is typically not very useful without the application schema and all the tables
  - Many databases provide column level encryption for critical data
- Reports and extracts can usually be saved externally
  - Local storage, USB devices
    - Email, dropbox, Fax
- Some applications provide access control, local save prevention, etc.
  - But not all
- Once extracted, the data is essentially now file data

Threats to unstructured data (files)

- Physical removal
  - Repair of drive arrays
    - Annualized Failure Rates of 8.6% for 3yr old drives (1.7% new drives)^
      - For 1000 drives = 17 failures 1st year, 86 failures 3rd year
  - Loss or theft of hardware
    - Laptops
    - Servers (outside the main datacenter)
- Copying and subsequent misuse
  - Backups, Archives, DR sites
    - Unattended sites give plenty of opportunity for misuse
  - USB devices, paper copies, home backups, mobile backups
  - Email, DropBox, Fax, etc.

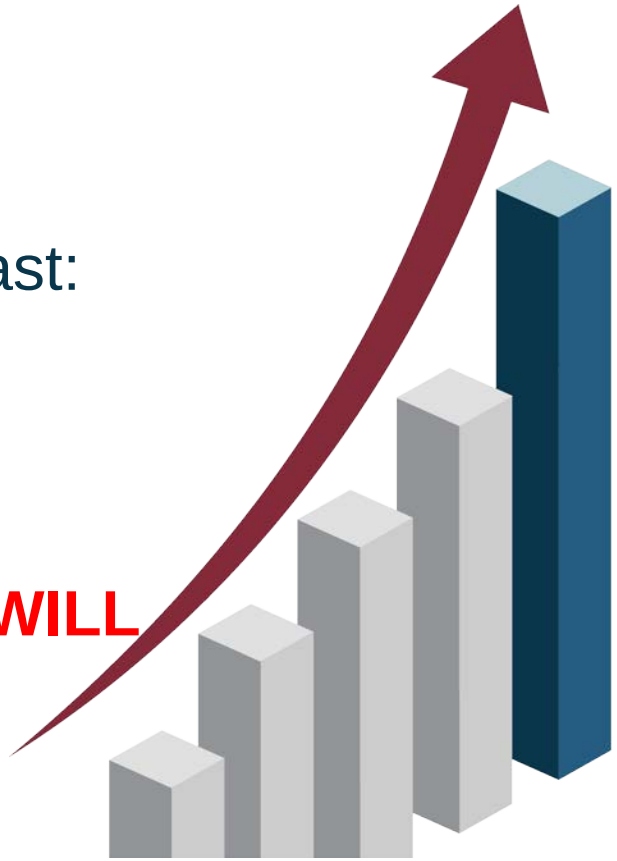
^Google 2007 study

Threats to unstructured data (files)

- Unauthorized access by Users
  - Simply browsing to places they should not be able to access
- Criminal access by Users
  - Targeted at specific data
- Unauthorized/criminal access by System Admins
  - Who need to have access for operational reasons
    - Backups, replication, etc.
- File Sharing
  - Can allow simple access to vast quantities of files
- The sheer size and growth of files

Unstructured data growth

- File-based storage (NAS) is exploding YoY:
  - IDC: 28%
  - Gartner: 36%
  - NetApp & EMC: ~30%
- Ethernet-attached storage growing fast:
  - iSCSI/NAS: 50% using it by 2014 (Gartner)
  - 27% in 2012
  - Using existing network architectures
- Problem is not going to go away—it **WILL** get worse



More can be better, but less is bad

What data needs to be secured

- Typically there are four categories of file data that need to be secured:
  - Classified Information
    - Governmental, Military, Intelligence - strict hierarchical schemes, etc.
  - Regulatory Compliance
    - Current: HIPAA, PCI, PII, etc. – binary – no shades of gray
    - Future ?: GDPR (General Data Protection Regulation), Right to be Forgotten
  - Confidential information
    - Intellectual property
    - Proprietary information
    - Competitive data, etc.
  - Anything else for any other reason
    - Whenever there is a need, whatever it is, good or bad!

Does it ALL have to be secured

- It depends on a number of factors:
  - Identification
    - Do you know where ALL your critical data may reside
  - Relevance
    - Is it possible to segregate relevant from irrelevant
    - Can you be sure you can identify ALL the relevant data
  - Quantity of data
    - Column level encryption
    - Tokenization / Obfuscation
    - Deduplication, Compression before securing
  - Impact of revelation, loss, or misuse
    - Can you afford the immediate cost
      - Monetary penalties, business restrictions
    - Can you afford the longer term cost of loss of reputation

Where do the threats come from

- From outsiders
  - Where the most money is spent by IT (~12% storage budget)
- From Insiders
  - System Admins
    - 82% according to FBI
    - Human Engineering

Perimeter security is ineffective

- Perimeter defenses are ineffective today according to security
  - 31
  - industry
- 59% said t meter breach occurred, high value data would not be safe
- 66% believe they will suffer a breach within the next 3 years

Show of hands:
Has your organization ever experienced a data breach?

* 2012 study by SafeNet Inc.

Why data security is needed

- 95% continue to invest in and employ the same data security strategies (Network perimeter security)
- 35% state they know their security investments are being deployed to the wrong technologies
- 20% would not trust their own personal data to their own networks

So what does all this mean?

- We have to accept that breaches WILL happen and once they do, the only protection is to secure the data itself
- **The new perimeter is the data itself – we must Secure the Data**

Where do the threats come from

- From outsiders
  - Where the most money is spent by IT
    - Not effective
- From Insiders
  - System Admins
    - 82% of all breaches according to FBI
  - Corrupt or idealistic employees
- Do you remember when …

More can be better, but less is bad

… Snowdon was just a mountain in Wales

Where is file data accessed from

- In main datacenter(s)
  - Application server
  - NAS/Fil… …ystem or shared
  - User
  - Ba… …lisk
  - Al… …sk
  - Vir…
    - …
- Managed fro… …rs
  - Cloud (Public, Private, Hybrid)
    - No different than backups and archives

Quick Show of Hands:

How many of you know the location of EVERY clone or snapshot of your VMs?

Where is file data accessed from

- Distributed locations, remote offices
  - App server
  - NAS server
  - User desktop

  Computer-local file system or remote file system in main datacenter over VPN
  - Backup device – local/remote tape or disk, external drives
  - Virtual Machines – when not running
    - Clones, snapshots

Where is file data accessed from

- Mobile – two types
  - User mobile device – local file system
    - Support for local apps may not be possible
    - USB dri[illegible]xt
  - Enter[illegible]
    - S[illegible]
    - [illegible]
- Mobile[illegible]ed down locati[illegible]
- Mobile dat[illegible]d rarely secured
  - Home backups, clo[illegible]kups, USB sticks, smartphones
- With BYOD, this problem goes exponential!

Quick Show of Hands:

How many of you make backups of your company data at home or on USB?

What threats exist against file data

Assuming that all critical file data is actually encrypted:

- Distributing to remote locations can expose centralized keys
- Distributing to mobile devices can expose data as well as keys
- Database reports and extracts
  - Written to desktops, mobile devices, removable storage, etc.
  - Data leakage when further distributed via email, etc.
- Data exposure to unauthenticated people
- System administrators posing as authenticated users
  - **80%+ of all actual breaches are internal**

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What threats exist against file data

- From Dark Reading (June 2013):
  - In a survey conducted by Avecto at the recent Infosecurity Europe conference, 41 percent of security professionals rated malicious insiders as their chief worry.
  - More than 30 percent of respondents said they have no policy in place for managing administrator access.
  - The most common threat comes from employees who download and install unauthorized software, without understanding the potential risks associated with their actions.

Distributed File Data – remote access

- File data in a central datacenter can be accessed remotely with a high level of security and auditability
  - VPNs, Two Factor Authentication, etc.
- Centralized access results in good access control, policy enforcement, auditing and reporting
  - Alerting essential for real time response and prevention
  - Auditing and reporting ssential for post mortem investigations and compliance evaluation
- End points can be authenticated in real-time
  - Varying levels of authentication depending on user, platform, location, information accessed ,etc

Distributed File Data - inbound

- Moving or copying file data from remote sites to datacenters can be managed with careful planning
  - Daily replication/copy to HQ over secure tunnels
  - Backups to HQ over secure tunnels
- File data can be re-encrypted as it arrives
  - Depending on policy, etc.
  - Key versioning and tracking necessary

Distributed File Data – outbound

- Moving or copying file data from a datacenter to a distributed or remote location is problematic
  - Cannot use same encryption key as primary file data
    - File data usually encrypted on a per-share or per-folder basis rather than per-file
    - In any case, file must be duplicated and encrypted with a different key before sending
    - Means the key management system must track multiple keys per file (like versioning) to support secure destruction
  - Once file data is remote, access and auditability is a problem
    - Key exchange with remote location exposes key
    - Any offline access to the file bypasses real-time authentication
  - Detecting file data changes when file is returned to datacenter
    - Results in multiple copies of file data
      - with multiple keys

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Mobile File Data – even more problematic

- Moving or copying file data from a datacenter to a mobile device is even more problematic:
  - Loss of mobile device
    - Can be mitigated with FDE (Self Encrypting Drives)
  - No control over who, when or where data is accessed
    - Only if online authentication is mandatory (not possible in many situations)
  - Pre-upload is normally required
    - Copy files onto device before leaving for business trip
    - Means keys must also be pre-loaded
  - Duplication of file data to same or alternate mobile devices
    - Including keys
  - Saving of cleartext file data to removable devices

Conclusions

- We need to accept that network perimeter breaches WILL happen – the new perimeter is the data itself
- Different file data categories need different protection schemes – sometimes there is overlap
- An insider is your biggest threat for large data breaches (but you must also protect against intrusion)
- Mobile devices pose the biggest management challenges
- A centralized reporting and auditing capability is important
- A centralized alerting capability is essential
- File encryption alone cannot succeed without fully integrated authentication, access control, and Enterprise Key Management
- **We must Secure the Data as well as the networks**

Thank You

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Attribution & Feedback

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