STORAGE DEVELOPER CONFERENCE

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BY Developers FOR Developers

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Storage Security Update for Developers

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Current Threat Landscape

- Social Engineering
- Advanced Persistent Threat (APT)
- Ransomware/Malware
- Unpatched/Updated Systems
- Security Misconfiguration
- Denial of Service
- Sensitive Data Exposure
- Injection Flaws
- Cryptojacking
- Cyber Physical Attacks
- Broken Authentication
- Broken Access Control
- Third Party (Supplier)
- Insider Theft
- Mobile Malware
- Physical Loss of Devices
- Cross-site Scripting (XSS)
- Man-in-the-Middle Attacks
- IoT Weaponization

Common Threat Actors

- Cyber Terrorists
- Government-sponsored/State-sponsored Actors
- Organized Crime/Cybercriminals
- Hacktivists
- Insiders
- Script Kiddies
- Internal User Errors

Common Motivations

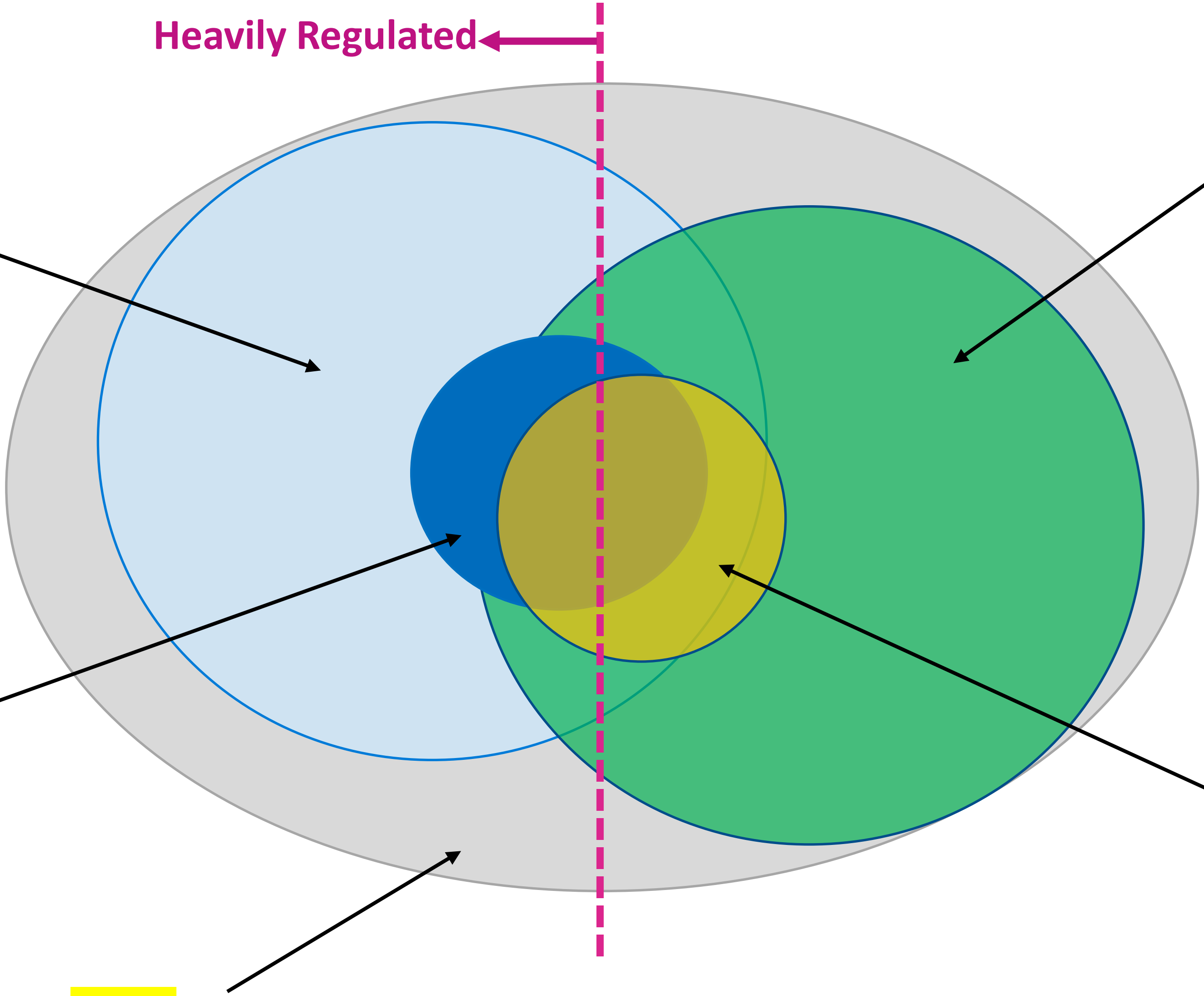
- Political, Economic, Technical, and Military Agendas
- Profit/Financial Gain
- Notoriety
- Revenge
- Multiple/Overlapping

Security is a People Problem!

Noteworthy Examples of Attacks/Breaches

- Colonial Pipeline attack in the US (critical infrastructure)
- Russian/Ukraine Hacking
- Lampsus$ digital extortion gang theft of source code and data
- Costa Rica state of emergency (ransomware by cybercrime gang Conti)
- North Korea’s Lazarus Group’s theft of $540M cryptocurrency
- Data theft from health care providers (ransomware and data breaches)

Privacy: Collection Limitations, Data Quality, Purpose Specification, Use Limitation, Security Safeguards, Openness, Individual Participation, Accountability



Information Security: Ensures Confidentiality, Integrity, and Availability (CIA) of information

Personal Data Protection: Safeguards applying under various laws and regulations to personal data (PII, PHI, etc.) about individuals that organizations collect, store, use and disclose

Ethics: Moral principles that govern a person's behavior or the conducting of an activity

Cybersecurity: Ensures Confidentiality, Integrity, and Availability of data; Identify, Protect, Detect, Respond, Recover

Legal/Regulatory Landscape

- Cybersecurity (many)
  - US DoD Cybersecurity Maturity Model Certification (CMMC)
  - US Presidential Executive Orders (Zero Trust, Consumer IoT Labeling)
  - EU Digital Operational Resilience Act (DORA)
- Privacy (many)
  - EU General Data Protection Regulation (GDPR)
  - China Personal Information Protection Law (PIPL)
  - Multiple US state (e.g., CA CCPA/CCRA)
- Cybersecurity/privacy litigation on the rise
- Other
  - EU Directive 2009/125/EC (LOT 9)

Changes to Key Security Frameworks

- ISO/IEC 27000-series Security Standards
  - New ISO/IEC 27001 (Nov-2022) and ISO/IEC 27002 (Feb-2022)
  - New ISO/IEC 27040 Storage security (Q1 2023)
- Payment Card Industry (PCI)
  - PCI Data Security Standard 4.0 (Mar-2022)
- NIST
  - NIST SP 800-53 Rev. 5 (Sep-2020)
  - NIST Cybersecurity Framework (CSF) 2.0 initiated

- Significance: Security professional adjusting to changes (distracted)

Gazing into the Crystal Ball

Important Trends

- “Reasonable” security has a risk-based aspect
- Supply chain security
- Circular economy (reuse)
- Product security certifications (FIPS 140, Common Criteria, etc.)
- Zero Trust Architectures (primarily US Government)
- Cloud/Edge computing

Why Should Developers Care?

- Secure by design and secure by default are expected
- Vulnerability prevention and management are expected elements of the product development process
- Practicing poor cyber hygiene can have legal implications
- Source code and design specifications stolen on regular basis
- Ransomware attacks are delaying or wiping out projects
  - Paying a ransom does not guarantee a recovery
- Attackers are attempting to inject malicious code into code base
  - Open source and vendor proprietary

Storage Security Event Horizon

- Secure eradication of data on storage devices and media
  - IEEE 2883-2022 provides specific requirements and guidance
- Storage security added to security audit criteria
  - ISO/IEC 27040 (2nd Ed) includes requirements and referenced by ISO/IEC 27002
- Computational storage security considerations
- Key Per IO for NVMe storage
- Post Quantum Cryptography (PQC)

Summary

Conclusions

- Many of the security standards that are relevant to storage are new or recently updated; typically have requirements
- Exploiting some of the new storage security capabilities and practices can require significant changes
- The *trust, but verify* security mantra is practiced by many organization; vendors must earn and maintain this trust to be a supplier
- Prepare for the inevitable attacks

Additional Resources

- SNIA Storage Security Resources
  - https://www.snia.org/security
- NIST Cybersecurity
  - https://www.nist.gov/cybersecurity
- ISO/IEC Information security, cybersecurity, privacy protections
  - https://www.iso.org/committee/45306.html
- Payment Card Security Standards Council
  - https://www.pcisecuritystandards.org/
- Center for Internet Security (CIS)
  - https://www.cisecurity.org/cis-benchmarks/

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