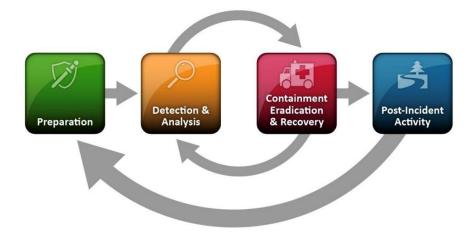


K12 SIX ESSENTIAL CYBER INCIDENT RESPONSE RUNBOOK

Experiencing a cybersecurity incident involving the disruption of school operations, fraud, or a potential data breach is stressful. The actions you take in the hours and days following discovery of the incident are critical to your ability to recover and key to maintaining the trust of your school community. This resource—developed by the K12 Security Information eXchange (K12 SIX) and its members—is intended to assist U.S. K-12 school districts and other K-12 organizations in preparing to respond to a cyber incident. It is a complement to the K12 SIX Essential Protections, which identifies the baseline cybersecurity controls that all school districts, charter schools, and private schools can and should implement to defend their school communities from emerging cybersecurity threats.

The K12 SIX Essential Cyber Incident Response Runbook is aligned to the NIST Incident Response Life Cycle, which identifies the major phases of the incident response process—preparation, detection and analysis, containment, eradication and recovery, and post-incident activity.

This resource is designed to be printed, marked up, and distributed. You may not be able to rely on your IT resources during an incident! Your customized copy of the



K12 SIX Essential Cyber Incident Response Runbook should be practiced regularly via tabletop exercises and updated periodically as circumstances change. When your organization is ready, it can serve as the basis for a full cyber incident response plan, ideally integrated into other organizational emergency operations and disaster recovery plans.

Even in cases where your organization will rely on the services of an external provider for most incident response services, understanding the myriad issues that may arise during a cyber incident will increase your operational resilience and time to recovery.

Change History Log:

Version Number	Release Date
1.0	June 22, 2022



Do Not Proceed Before Completing This Information

In case of an event:

- Stay calm
- Preserve your organization's ability to investigate and recover by isolating, not prematurely powering off affected systems
- Do follow your incident response plan
- Do ask for assistance: in most cases, your actions should be dictated by incident response experts



Your organization may not have individuals in each of these roles. Be sure to include alternate contact information in case your internal communications or email systems are compromised.

TITLE/ROLE	CONTACT INFORMATION	TITLE/ROLE	CONTACT INFORMATION
<internal external=""></internal>	<name> <work phone=""> <alt phone=""> <work email=""> <alternate email=""></alternate></work></alt></work></name>	<internal external=""></internal>	<name> <work phone=""> <alt phone=""> <work email=""> <alternate email=""></alternate></work></alt></work></name>
CISO/InfoSec Lead - Internal		MSSP/SOC Provider - External	
IT Leader - Internal		General IT/MSP Provider - External	
General Counsel – Internal		Breach Counsel – External	
Superintendent/Head of School – Internal		Cyber Insurance Broker/Provider – External	Policy #:
Chief Financial Officer - Internal		Local Law Enforcement - External	
Operations - Internal		FBI Representative - External	
Communications/PR - internal		Communications/PR - external	
Human Resources – internal		Incident Response Consultant - external	

TITLE/ROLE	CONTACT INFORMATION	TITLE/ROLE	CONTACT INFORMATION
<internal external=""></internal>	<name> <work phone=""> <alt phone=""> <work email=""> <alternate email=""></alternate></work></alt></work></name>	<internal external=""></internal>	<name> <work phone=""> <alt phone=""> <work email=""> <alternate email=""></alternate></work></alt></work></name>
Nutrition/Food Services – internal		Financial Institution - external	Acct #:
Payroll/Accounting – internal		Payment/Credit Card Processor - external	Acct #:
Physical security – internal		ISP - external	Acct #:
Chief Privacy Officer/Privacy lead – internal		Financial IT System(s) provider – external	
Transportation – internal		Human Resources IT System(s) provider - external	
Incident Response Team Leader – internal		Learning Management IT System(s) provider - external	
Incident Response Team Investigator – internal		Student Information IT System(s) provider – external	
Incident Response Team Administrator – internal		Cloud Productivity Application Suite provider - external	
Other:		State Data Breach Notification Agency - external	
Other:		Other:	
Other:		Other:	
Other:		Other:	

There are four inter-related stages—preparation; detection and analysis; containment, eradication, and recovery; and post-incident activity—involved in cybersecurity incident response:

1.0 PREPARATION – involving the training of personnel and the gathering of information, tools, and resources.		
1.1 Define a Cyber Incident	How does your organization define a cyber incident?	
	 For instance, a cyber incident can be defined as anything that violates or poses a threat to a K-12 organization and/or is a violation of its policies and procedures. Examples of K-12 incidents include: Misuse of district technology resources by staff, students, or third parties (Policy violations) High volumes of connection requests to public facing servers that degrade performance or cause outages (DDoS - Distributed Denial of Service Attack) A user opens an email and clicks on an attachment or link, leading to the installation of malware or network connections to an external system (Phishing) An attacker exploits an unpatched server vulnerability to gain access to sensitive data and exfiltrate it before encrypting school IT systems (Ransomware) 	
1.2 Define Cyber Incident Response (IR) Team Roles	 Who is a part of our Cyber Incident Response (IR) Team and what do they do during an incident? IR Team Leader: Responsible for overall leadership and management of the IR Team. Responsible for declaring an incident and are responsible for invoking incident response plans. Assigns the IR Team Lead Investigator and identifies resources needed during all stages of incident response. IR Team Administrator: Responsible for ensuring all stages of incident response are thoroughly documented and serves as the point of contact for legal counsel, insurance representatives, communications/PR, and other internal stakeholders about the incident and response. Also, handles logistical needs necessitated by the response (e.g., meals, command center, lodging). First Responder: (NOTE: **Most** IT staff should be trained in this role) First person to identify/recognize the incident. Assesses the situation and whether incident is reportable. Preserves evidence. Contacts IR Team Leader and serves as IR Team Lead Investigator until IR Team Leader formally assigns role. Serves as ad hoc Team Leader until designated person can be notified. IR Team Lead Investigator: Named by the Team Leader. Responsible for coordinating comprehensive response activities (network/hardware/software), including most technical aspects of the incident. NOTE: Role may be filled by external technical experts skilled in detection and response. Communications/PR: In consultation with legal counsel, responsible for ALL inbound/outbound communications with media and other external stakeholders. 	

1.3 Identify Contacts	Complete, print, and share contact template above.		
and Key Resources	Incident response is a team sport. Make sure you've identified all important stakeholders and know how to reach them, including via alternate channels in case internal systems are compromised or offline. Print and share the completed template.		
1.4 Assemble	What relevant formal policies, plans, and procedures does your organization already		
Existing Plans	have in place?		
and Tools	Review documents and ensure up-to-date printed copies are available. These may include:		
	☐ Business Continuity Plan & Continuity of Operations Plan (COOP)		
	☐ IT network, asset, and emergency plans		
	☐ Crisis/Emergency Management Plan		
	☐ Communications Plan		
	☐ Disaster Recovery Plan		
	☐ Training or Phishing Mitigation Plan		
	☐ Risk Management Plan		
	Cybersecurity Insurance Documentation		
	☐ Other:		
1.5 Prepare for Stakeholder	Prompt, clear, and consistent communication is vital in any crisis. Don't leave it to chance.		
Communications	Prepare your communications/PR team (internal and/or external) for cyber incident communications, including via tabletop exercises. Be sure to consider:		
	 Advising staff to not share unauthorized incident-related communications/post on social media 		
	☐ Need for legal consultation before any (internal or external) communication		
	 Pre-writing and vetting sample notifications to staff, families, and the media for common K-12 cyber incidents 		
	 Alternative/out of band communications if locked out of normal communications systems (e.g., email, website, social media) 		
	The need for regular updates to stakeholders during the process of incident response and recovery		

	ANALYSIS — Determining the potential scope and impact of a cyber incident helps prioritize efforts—including stakeholder communications.
2.1 Prepare for Common K-12 Incidents	Understand common K-12 cyber incident vectors and prepare for them. These may include: Brute force attacks Compromised/stolen credentials Insider actions (students, staff, administration) Internet-exposed services Malware/ransomware Misconfiguration Network stressers/DDoS stressers Phishing/business email compromise Remote access/work Unpatched/end-of-support servers and systems Vendor/partner compromise
2.2 Monitor for Potential Incidents	Understand the possible sources and precursors of potential cyber incidents. These may include: Alerts/advisories from trusted sources (e.g., K12 SIX, MS-ISAC, CISA, FBI) Antivirus events Evidence of reconnaissance or discovery activities Failed logins or unusual login locations (e.g., IP ranges or impossible travel) Firewall alarms and mismatched traffic Large increase in bandwidth usage or database activity Large numbers of opened/copied files New administrative users created, or users added to admin groups Reports from end users Unexpected deletion or modification of files Unexpected increase in log files Unexpected new objects or services (user or computer) Unexpected patching of systems Unusual files or processes, or stopped services Website defacement

2.3 Initial Steps	Train IT staff on the steps to declare a potential cyber incident and invoke the IR Team.		
Upon Discovering a Potential Incident	These steps may include: Contacting IR Team Lead and declaring an incident Logging/recording actions taken—including what was done, when, on which systems, by whom, and for what reasons. This will assist with later phases of incident response Alerting executive leadership* of the incident and status Contacting legal counsel* and—as directed and appropriate—communications/PR team, cyber insurance broker/provider, law enforcement, related vendor(s)/external partners, and others *Be aware that attackers may have access to organizational email, instant message, and helpdesk systems. Use out-of-band communication methods/ face-to-face meetings, as appropriate.		
2.4 Gather and	Gather and document evidence to assist with incident response and fulfilling legal		
Document	obligations. Be careful not to destroy evidence or impede further investigation.		
Evidence	Consider:		
	 □ Increasing log retention/snapshot duration for length of investigation □ Collecting and archiving applicable logs, including from before the event (e.g., from firewall, IDS, SIEM, antivirus, event/system logs, content/DNS filters) □ Capturing network activity (e.g., bandwidth, open ports, DNS, packet captures) □ Recording affected host information (e.g., IP, hostname, MAC address, user(s), asset ID/barcode, serial number) □ Assessing and documenting what you know for executive leadership, communications/PR team, legal counsel, and external IR consultants (if any) including: □ Indicators of compromise (include what/when/how) ○ Attack artifacts (e.g., screenshots, scripts/code, instructions, configuration changes, email rules) ○ Attacker's goal (e.g., exfiltrating, destroying, changing, or encrypting data; disabling or disrupting systems; theft of funds; repurposing of IT resources; reconnaissance/spying, etc.) ○ Scope of attack (e.g., number of systems/users affected, types of data involved, impact on operations, estimated time to recover, etc.) ○ Estimated time to recover affected systems and overall □ Recalling offsite backups, as appropriate, for potential future restoration activities Should the incident involve a student, see Appendix A for further considerations and guidance. 		

2.5 Notify Stakeholders	In compliance with your legal obligations and incident type/operational impact, implement your plan to notify stakeholders and affected parties.		
	☐ Seek legal guidance before initiating communications		
	Prepare to address common questions:		
	 Who attacked you/caused the incident? Why? 		
	 When and how did it happen? 		
	 How widespread is the attack? 		
	 Was any PII or sensitive information exposed, including social security numbers or other financial data? 		
	 What steps are you taking to remediate the incident and prevent future occurrences? 		
	Do not overstate the certainty of evolving situations (e.g., caveat with		
	statements such as 'at this time,' 'so far as we know,' etc.). "We don't know yet" is a legitimate response. Some questions may best be answered by law enforcement.		
	 Be consistent and regular in messaging. Consider daily updates for evolving situations. 		
	 Engage with media, as appropriate, and monitor social media. Information voids may lead to unfounded speculation and loss of trust 		

3.0 CONTAINMENT, ERADICATION, AND RECOVERY — based on the information gathered during the prior stage, thoroughly eradicate malware and vulnerabilities—and restore normal operations 3.1 Contain the Block compromised systems from communicating with other devices or with attackers. incident Caution should be taken before taking steps to contain the incident. For instance: Incident responders/law enforcement may wish to monitor an attacker or gather additional evidence before beginning containment activities. Once containment and eradication efforts begin, attackers may change tactics, targets, or intensity of malicious activity. Continue to monitor systems closely and be prepared to move quickly in response. While containment strategies vary by incident type the goal is to block compromised systems from communicating with other devices or with the attackers. Powering off systems prematurely may delete in-memory evidence of compromise. Consider: ■ Blocking SSO/Cloud access ■ Blocking Internet/network access ☐ Disabling compromised accounts (revoke tokens and delete active connections) ☐ Disabling services, especially any that are being targeted Containment tools, which may be at your disposal, include: Endpoint configuration management tools (via Intune/SCCM and/or via AppLocker, JAMF, Google Chrome Device Management, etc.) EDR/Antivirus global controls

- Host-based firewall controls
- Switch ports, uplinks, and network segments (which can be disabled)
- Network firewall (for both inbound and outbound traffic)
- Content/DNS web filters

3.2 Eradicate the threat	After ensuring evidence has been preserved for legal and insurance purposes, eliminate all traces of the incident. This may entail:		
	 □ Correcting any misconfigurations identified □ Patching or upgrading all affected systems to fix exploited vulnerabilities □ Removing any unauthorized accounts □ Resetting passwords for compromised accounts ○ Revoke and reissue security certificates, MFA tokens, SSO/OAUTH/SAML connections to resources ○ If a domain administrator/root/SA-level account has been compromised, all account passwords may need to be reset or the account directory may need to be rebuilt □ Reimaging systems affected with malware Caution: To preserve evidence and ensure unwanted programs/backdoors do not cause recurring issues, some devices may need to be replaced, rather than remediated. 		
3.3 Recover and restore IT	Based on priorities and estimated recovery timelines, repair, restore, rebuild, or replace systems that were taken offline or otherwise affected by the incident.		
operations	Reference existing disaster recovery plans, if any, for prioritization		
	Replace/restore/reimage systems:		
	 Verify backups have not been tampered with 		
	Roll back to known good system state (but monitor for indications of		
	compromise/latent malware)		
	 Use known good OS sources and application installers Apply known good firmware to address (some) rootkit infections 		
	Discontinue, block, and retire vulnerable or unsupported technologies (e.g., SMB		
	v.1, SSL 3.0, Windows XP/7, macOS 10.14 or earlier, unsigned PowerShell scripts, default community strings for SNMP, etc.)		
	☐ Implement controls to prevent recurrence (e.g., MFA, geolocation controls,		
	privileged/secure access workstations, updates to user training, etc.)		
	Consider creating an isolated network or a new cloud computing instance to		
	protect recovered systems from re-compromise. Reset, restore, or recreate potentially compromised accounts		
0.404 % 6			
3.4 Monitor for Anomalous	It is critical to maintain vigilance even after IT operations have been successfully restored post-incident. Consider:		
Activity	Instituting more robust system logging and network monitoring		
	 Elevated monitoring of systems and network activity for anomalous activity, 		
	remote access, new/changed privileged accounts, or other signs of intrusion		
3.5 Update	Providing regular, high-quality communications about incident recovery helps		
Stakeholders on	maintain trust in the organization and executive leadership.		
Recovery Status	☐ Be aware of regulatory requirements for mandatory reporting of incidents like data breaches, which may require quick-turnaround notifications		

4.0 POST-INCIDENT ACTIVITY — document and share lessons learned from incident response to resolve deficiencies and strengthen the security posture of your organization, as well as those of peer institutions		
4.1 Conduct Post- Incident Review	The work of the IR team is not complete until a comprehensive assessment is prepared and shared with appropriate parties. (See Appendix B for sample learning and improvement questions.)	
	 Identify and resolve any deficiencies in your current cybersecurity risk management program (i.e., technologies, policies, and practices) that led to the incident Identify and resolve deficiencies in planning and execution of your incident response Assess whether additional cybersecurity risk management measures—technologies, policies, and/or practices—are needed to prevent a recurrence of the issue and strengthen the security posture of your organization 	
	☐ Ensure the incident is sufficiently documented to meet public records, law enforcement, and/or insurance requirements	
4.2 Brief Executive	As appropriate, prepare a final report to executive leadership on the incident and	
Leadership	response.	
	 Describe the root cause of the incident (non-technical) Summarize the actions taken to respond and recover from the incident (non-technical) Describe any remaining issues 	
	 Summarize actual recovery expenses incurred (such as labor, fees, consultants/contractors, equipment purchases, etc.) 	
	Summarize recommended cybersecurity risk management program short-, medium-, and long-term-improvements, including estimated costs	
4.3 Implement	Ensure that lessons learned from experiencing an incident are enacted and shared with	
Changes	other K-12 organizations.	
	 Implement recommended measures to strengthen the security posture of your organization Share lessons learned and recommended mitigations with other K-12 community members, including by securely reporting the incident to K12 SIX 	
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APPENDIX A: IF INCIDENT INVOLVES A STUDENT

Preparation: Student-Initiated Incident

- Isolate student networks from high-risk systems where possible
- Ensure all students understand and sign a network use agreement that explicitly calls out bad behaviors and consequences
- Inform district and building administrators of the type of risks posed by potential malicious student cyber activity and establish a severity scale to guide disciplinary actions (incident scope and impact should drive discipline)
- Determine level of police involvement, if any, if student-initiated incidents. Establish a relationship with local police department(s) to identify correct contacts, as well as protocols regarding whom from the district will make contact
- Educate faculty and staff on classroom behavioral "look-fors" that may indicate malicious activity (e.g. hiding of screen, quick changes between applications, etc.)

Post-Incident Activity (Short-/Mid-Term): Student-Initiated Incident

- Work with district official(s) responsible for special education services to determine if the student(s) involved have an Individualized Education Plan (IEP) or other special education accommodations.
 These factors impact the course of disciplinary and legal actions.
- Include building principals or designee in all conversations related to incident scope
- Follow your established discipline process, as appropriate, usually starting with a warning. A second offense might result in more limited internet access and a discussion with the parents. A third offense could result in more serious consequences
- Working in conjunction with building principal or designee, include parent/guardian in scope discussion(s), as well as conversations related to disciplinary action. Establishing a good rapport with parent(s)/guardian(s) early on can help lead to a better outcome for the school and student.

Post-Incident Activity (Long Term): Student-Initiated Incident

- Document the incident carefully, as it could be used in legal suits later
- Consider redirection of the student to more productive targets such as 'Hack The Box,' capture the flag (CTF) contests, or recruitment into a school-sponsored tech support program
- If the student's device can't record *all* activity (including, e.g., scripts run, etc.) consider adding an XDR or similar monitoring agent on student's device moving forward

APPENDIX B: SAMPLE LEARNING AND IMPROVEMENT QUESTIONS

Learning and improvement questions

- How well did the staff and management perform?
- Were documented policies and procedures followed?
- Were the procedures adequate?
- Was the actual cause identified?
- What information was needed sooner?
- Were any steps taken that might have inhibited recovery?
- What should/would staff/management do differently the next time a similar incident happens?
- How could information sharing (in/out) with other organizations have been improved?
- What corrective actions can prevent or lower the likelihood of similar incidents in the future?
- What precursors or indicators of compromise should be watched in the future to speed up detection?
- What additional tools and/or resources are needed to address future incidents?
- What tools, processes, metrics, or resources could be in place and/or monitored to detect a similar incident sooner?

Root cause analysis questions

- Exactly what happened, and at what times?
- How effectively was the incident identified and logged (including precursors)?
- Were there any leading-edge indicators of detection that were missed?
- Did the incident cause damage before it was detected?
- Was the actual cause identified?
- Was the incident a recurrence of a previous incident?
- What could have prevented the incident?
- Do logs, forms, reports, and other incident documentation reflect adherence to established incident response policies and procedures?
- Was there a difference between the initial impact assessment and the final impact assessment?
- What was the estimated monetary damage from the incident (e.g., information and critical business processes negatively affected by the incident, IT staff resource re-allocation, new equipment/services purchased, incident response/recovery consultant fees, etc.)?

APPENDIX C: REFERENCES AND RESOURCES

- K12 Security Information eXchange: https://www.k12six.org/
 - o K12 SIX Essential Cybersecurity Protections: https://www.k12six.org/protective-measures-series
 - Membership Portal Login: https://k12six.cyware.com/
- US Department of Commerce, National Institute of Standards and Technology (NIST)
 - Computer Security Incident Handling Guide (800-61):
 https://nvlpubs.nist.gov/nistpubs/specialpublications/nist.sp.800-61r2.pdf
 - Guide for Cybersecurity Event Recovery (800-184):
 https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-184.pdf
- US Department of Education Privacy Technical Assistance Center (PTAC)
 - Data Breach Response Checklist:
 https://studentprivacy.ed.gov/sites/default/files/resource document/file/checklist data breach response 092012 0.pdf
 - Security Best Practices: https://studentprivacy.ed.gov/topic/security-best-practices
- US Department of Homeland Security, Cybersecurity & Infrastructure Security Agency (CISA) Ransomware Response Checklist: https://www.cisa.gov/stopransomware/ive-been-hit-ransomware
- Cyber Security Agency of Singapore Incident Response Checklist: https://www.csa.gov.sg/gosafeonline/resources/incident-response-checklist
- Texas Department of Information Resources (DIR) Incident Response Team Redbook: https://docs.google.com/document/d/1uvqgcUfzToNj6nFgtQoRQAkyL1SDGsRF/edit
- Microsoft
 - Incident Response Reference Guide: http://aka.ms/IRGuide
 - Security Best Practices Incident Response Overview: https://docs.microsoft.com/en-us/security/compass/incident-response-overview
 - Security Best Practices Incident Response Playbooks: https://docs.microsoft.com/en-us/security/compass/incident-response-playbooks
- Black Hills Information Security Backdoors & Breaches, an Incident Response Card Game: https://www.blackhillsinfosec.com/projects/backdoorsandbreaches/
- SecurityStudio K12 Incident Response Management Plan Template: https://securitystudio.com/policy-templates/k12-irp/

About the K12 Security Information eXchange

The K12 Security Information eXchange (K12 SIX) is a cyber threat information sharing hub for K-12 organizations—including school districts, charter schools, private schools, and regional and state education agencies—to aid in preventing and mitigating attacks. This non-profit member community is a cost-effective forum for crowdsourcing security information among a vetted, trusted group of



professionals with a common interest, using common technology and with supporting, independent analysis from the K12 SIX security staff and the Global Resilience Federation multisector network of information sharing communities. Visit www.K12SIX.org to learn more.

The development of the K12 SIX Essential Cyber Incident Response Runbook was made possible with the support of Microsoft.



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