Global Information Assurance Certification Paper

A Practical Social Media Incident Runbook

GIAC (GSEC) Gold Certification

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Abstract

Enterprise business strategy often includes the use of third party social media services such as Facebook, Twitter, LinkedIn, and Youtube to establish brand reputation, relay information, and solicit customers. These social media services now represent new security risks for organizations and a valuable target for attackers. Responsible organizations use pre-established incident handling procedures for data breaches, phishing attacks, and DDOS attacks but may not have a social media incident runbook. Each of the six phases of the incident handling process can be analyzed from the perspective of a social media security incident and used to construct a runbook. Like other security incident runbooks, when a social media incident runbook has been specifically tailored to the organization's environment it will be a critical guide to deal with future social media security incidents.

1. Introduction

In the course of a few short years, social media has clearly become a valuable marketing and communication tool in business strategies. Tina McCorkindale, Ph.D. Assistant Professor from Department of Communication at Appalachian State University, recently studied the strategic use of social media among Fortune 250 companies and "found that 91% of the companies utilized at least one social media platform. YouTube was the most commonly adopted social media service followed by Twitter then Facebook." Perhaps even more compelling is that more than 80% of small to midsized businesses intend to increase social media use in 2013 (Pick, 2013).

This growing social media landscape represents a relatively new cyber battleground for attackers and organizations. Nearly everyday it seems there are new reports of well-known brands and organizations that have fallen victim to a social media account compromise. Some of these incidents have had seemingly mammoth repercussions such as when the Associated Press' Twitter account was compromised on April 23, 2013. An attacker was able to gain control of the account and tweet that there had been explosions in the White House and that U.S. President Barack Obama had been injured. Of course the claim was quickly identified as false, but not before the US Stock Market "fell about 1 percent … briefly wiping out $136 billion in value" (Lee, 2013). Other social media compromises appear to be less impactful but still embarrassing for the businesses involved. For example, the Burger King Twitter account was compromised on Monday February 18, 2013 followed the next day by a compromise of the US car brand Jeep. This led to a lighthearted tweet by Jeep to Burger King saying, "Let us know if you want to grab a burger and swap stories – we'll drive" (@Jeep February 19, 2013).

In the latest revision of the Computer Security Incident Handling Guide the U.S. National Institute of Standards and Technology (NIST) suggests that "containment strategies vary based on the type of incident. For example, the strategy for containing an email-borne malware infection is quite different from that of a network-based DDoS attack. Organizations should create separate containment strategies for each major incident type, with criteria documented clearly to facilitate decision-making" (Cichonski, 2012). As recommended by NIST, most organizations likely have specifically-designed containment strategies, or runbooks, for assisting with certain incident types like DDOS attacks, phishing attacks, and malware infections. However, does the organization have a social media incident runbook to successfully guide the business through a high stakes

social media account compromise?

When the six phases of the security incident handling process are analyzed from the perspective of a social media account attack, they can facilitate a practical social media incident runbook (Skoudis, 2008):

- Preparation
- Identification
- Containment
- Eradication
- Recovery
- Lessons Learned

The following analysis and sample runbook is meant to be a customizable framework for security incident handlers. The documented strategies will assist organizations who are preparing for a potential social media security incident and may provide containment ideas for organizations already dealing with an active incident.

2. Preparation Phase

For many organizations, the management and operations of enterprise social media accounts are handled outside the IT division in departments such as public relations or human resources. This means information about what social media services are subscribed to, who manages them, and how they are managed can be largely unknown and undocumented. This common situation potentially makes preparation the single most important aspect of a social media incident runbook. For example, if an organization's Twitter account credentials are compromised, the incident handler would need to answer expeditiously where the same username and password are used. What other enterprise social media presence could also be compromised? Who is the administrator and are the devices they use the source of the compromise? How should the organization respond? "Incident response always begins with the steps taken to protect the organization's information resources before an incident takes place" (Lucas, 2004). Answering as many of these questions upfront before an incident can significantly decrease frustration for the organization and shorten the time attackers have to further cause damage to the brand or business reputation. Key preparation tasks for a social media incident runbook include:

- Inventory Authorized Social Media Services
- Inventory Administrator Contact Information
- Inventory Administrator Authorized Devices
- Document Account Management Processes and Practices
- Document Incident Response Team Contacts
- Prepare Incident Notification

2.1. Service, Contacts, and Device Inventories

The initial inventories of social media services (see Table 1), administrator contact information (see Table 2), and administrator authorized devices (see Table 3) are the first critical elements of the preparation phase of the runbook. Enterprises most commonly utilize social media services are Twitter, Facebook, and Youtube. However, consider looking beyond these well known services for other social media sites such as Linkedin, Pinterest, blogs, etc. to include in the service inventory. Likewise, the administrator inventory should include not just the administrator but also any moderators who may also have access to the account. Finally, the authorized device inventory should include hardware and software used by the administrators (or moderators) to access the social media account including laptops, mobile devices, browsers, and third party applications. The organization (incident handlers in particular) need to clearly understand what and whom they are protecting as it is impossible to defend the unknown.

Authorized Social Media Service	Service Support Phone/ Email	Account Username	Email Account Used to Register Service
Facebook	650-543-4800 abuse@facebook.com	smrunbook	mary@hi.com
Twitter	https://support.twitter.com/orms/login_problem	@smrunbook	tw@hi.com

Table 1

Authorized Social Media Service	Authorized Administrator/ Moderators	Admin/ Moderator Contact Info	Notes
Facebook	Mary (admin)	310-555-5551 mary@hi.com	Travels
	Jack (moderator)	310-555-5552 jack@hi.com	Office Downtown
Twitter	Jim (admin)	310-555-5553 jim@hi.com	Hawaii Time Zone

Table 2

Authorized Administrator/ Moderators	Authorized Device Type	Device Information	Third Party Applications
Mary (Facebook Admin)	MacBook Pro	OSX 10.8.2 Serial # AAA-AAAAA IP Address: 10.1.1.1 MAC Address:	Safari
	iPhone 5	iOS 6.1.4 310-555-6767	Facebook App
Jack (Facebook Moderator)	Dell Inspiron	Windows 7 Serial # AAA-AAAAA IP Address: 10.1.1.1 MAC Address:	IE 9 Mozilla Firefox Hootsuite
Jim (Twitter Admin)	MacBook Pro	OSX 10.8.2 Serial # AAA-AAAAB IP Address: 10.1.1.2 MAC Address:	Safari Tweetdeck

Table 3

2.2 Account Management Processes and Practices

Interviewing the social media account administrators during the preparation phase can also generate helpful information while preparing for and documenting the preparatory elements of an incident runbook. Below are a few questions to consider and document with regards to account administration and password management practices:

- What is the process used to manage enterprise social media accounts? Can posts or content changes be made from hotel kiosks or only from approved authorized devices? Besides administrators, are there others who also have access to the social media accounts?
- What third party applications are used to manage social media?
- What is the documented process is for password management? Where are passwords stored, how strong are they, who has access to them, and what email account was used to setup the social media site? Is the password for the social media account the same as the

administrator's corporate account? Are the passwords for each social media account unique?

2.3 Incident Response Team Information

Besides the contact information for administrators and moderators collected in the general inventory, the runbook should include a list of other important contacts that may need to be notified of a social media security incident (see Table 4). For example it may be necessary to contact the local FBI office, law enforcement offices, public relations, security sponsor, management, or legal counsel to help respond to the incident.

Name	Role	Phone #s	Email
Michael	CISO	310-555-1111	mike@hi.com
Frank	FBI	310-555-6666	frank@fbi
Jerry	Legal Counsel	310-555-9999	jerry@law.com
Susan	Public Relations	310-555-8888	susan@hi.com

Table 4

2.4 Incident Response Notification

Handlers preparing the incident runbook should be careful to include non-technical business units during the preparation phase, particularly when tackling incident notification. The Information Security Management Handbook indicates that "business functions are typically not accustomed to dealing with computer issues and may be uncomfortable providing input or making decisions if 'thrown into the fire' during an actual incident" (Tipton, 2003). Most businesses will want to eventually acknowledge a security incident. The public relations division will likely be responsible for crafting the notification while legal counsel will be responsible for approving the notification. Working with these business units to develop and approve an incident response notification before an actual incident can save valuable time during the pressures of containment and recovery. Below are a couple of examples of messages shared by Burger King, Jeep, CBS, and the Associated Press soon after they recovered from Twitter account compromises. They appear to range from very formal, well thought out responses to less formal, spontaneous responses.

> "It has come to our attention that the Twitter account of the BURGER KING® brand has been hacked. We have worked directly with administrators to suspend the account until we are able to re-establish our legitimate site and authentic postings. We apologize to our fans and followers who have been receiving erroneous tweets about other members of our

industry and additional inappropriate topics."

— Burger King (@BurgerKing) February 18, 2013

“Hacking: Definitely not a #Jeep thing. We’re back in the driver’s seat!”

— Jeep (@Jeep) February 19, 2013

“Our Twitter account was compromised earlier today. We are working with Twitter to resolved.”

— 60 Minutes (@60Minutes) April 20, 2013

"The @AP Twitter account has been suspended after it was hacked. The tweet about an attack on the White House was false."

— Associated Press (@AP) April 23, 2013

Regardless of the formality or tone of the incident notification, having a prepared pre-approved message to publish, reassures social media followers that the enterprise takes security seriously. Customers can be quickly informed that appropriate actions to remediate the situation are underway. Additionally and maybe more importantly, preparing this message beforehand gets the non-technical stake holders thinking about information security and the potential risks of using social media before there is an actual incident.

3. Identification Phase

After taking steps to prepare for a social media security incident, the next step in the incident handling process is to identify a compromise. "The goal of the identification phase is to gather events, analyze them, and determine whether there is an incident" (Skoudis, 2008). The nature of current social media services is that there may be little event data available for identifying events of interest. Traditional log or event data that would normally be analyzed to help identify an incident is often inaccessible, nonexistent, or limited in detail for social media customer consumption. However, there are still peripheral indicators or residue that can be used to quickly and effectively identify a social media security incident.

3.1 Common Indicators of Compromise

Twitter suggests some simple indications that a customer may use to determine if an

account has been compromised (Twitter, 2013):

"Have you:

- Noticed unexpected Tweets by your account
- Seen unintended direct messages (DMs) sent from your account
- Observed other account behaviors you didn't make or approve (like following, unfollowing, or blocking)
- Received a notification from us stating that 'You recently changed the email address associated with your Twitter account' (even though you haven't changed your email address)"

The spirit of these indicators can be applied to any social media service the enterprise subscribes to and are essential in an incident handling runbook. The administrator can help the incident handlers quickly identify arrant, unintended, nefarious social media posts, or comments that are clearly indications of compromise. For example, the Burger King Twitter account was used to publish tweets related to a well-known hacktivist group Anonymous while the CBS twitter attack included tweets with suspicious links. Likewise, the administrator's inability to login to the account, detection of unexpected changes to the account profile, or notification that the account email address has changed are all warning signs. These events alone should provide the handler with information needed to quickly declare an incident.

3.2 Other Indicators of Compromise

With a little creativity, there are additional triage tasks that can also provide clues and indications of a social media incident. Take for example social media compromises that were the result of an intruder obtaining unauthorized access to the account through stolen credentials. How were they obtained? Did the administrator click on a phishing link and give up their credentials? Was an authorized device used to administer a social media site compromised? To effectively tackle the identification phase it is imperative to have the incident runbook look beyond the obvious indicators and evaluate behaviors associated with the administrators themselves and the devices they use to access the account. The following account activity, administrator activity, and device activity reviews should be part of a social media incident runbook.

3.2.1 Account Activity Review

Using the inventory of authorized devices established in the preparation phase, review any available authentication related data for suspicious activity. For example, Facebook provides a list of recent times the account was accessed with the following steps:

Login to account → Account Settings → Security Settings → Active Sessions

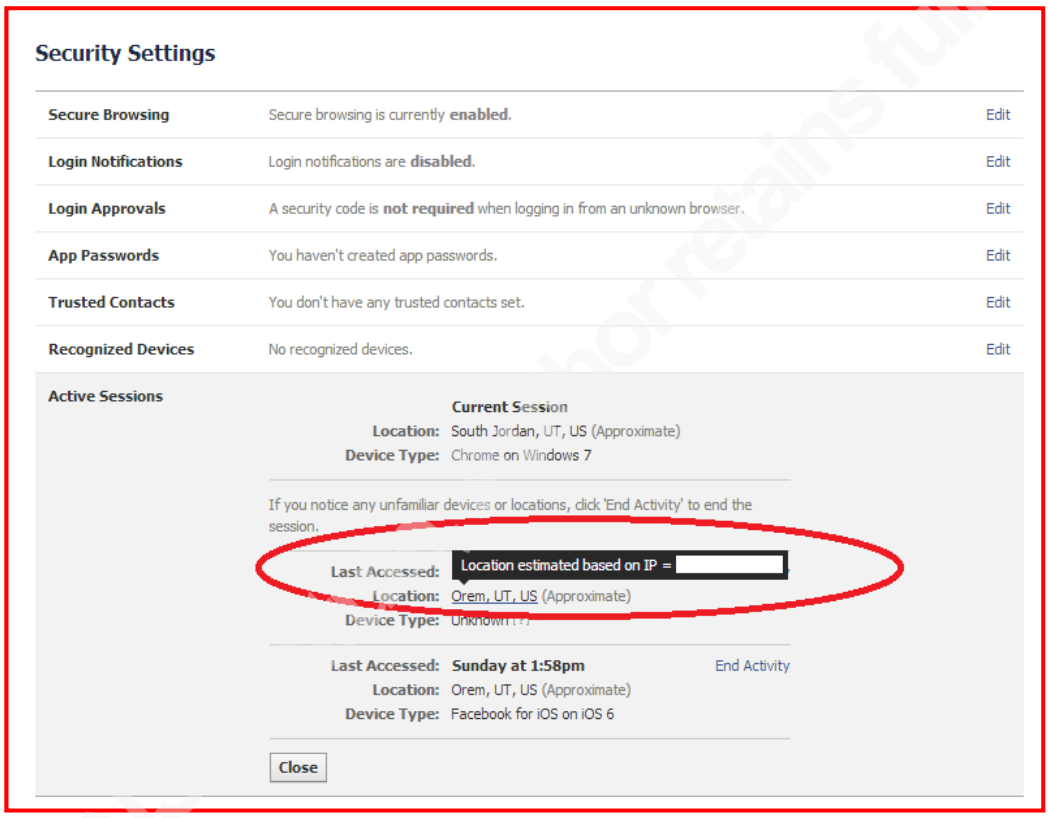

Figure 1

Hovering over the session's location information will even provide the specific IP used to access the account. Are the IP addresses associated with the organization? Are the timestamps reasonable? Are the application or device types in line with the established authorized device types documented in the preparation phase?

3.2.2 Administrator Activity Review

a. Did an account administrator fall victim to a phishing attack? Interview social media site administrators and the messaging team to identify potentially nefarious emails that the administrators or moderators may have fallen victim to. If an administrator or moderator was tricked into giving up their credentials, attackers would easily be able to gain

unchallenged access to the social media account.

b. Did the administrator fall victim to a website drive-by attack? Review administrator's web traffic for access attempts to malicious or suspicious URLs. If an administrator or moderator was tricked into visiting a malicious site that installed malware, attackers could easily log credentials or steal session tokens to gain unchallenged access to the social media account.

c. What email account was used to register the social media site? If it was a business account, review the organization's authentication activity for the account. Are there suspicious patterns of failed logins or activity? Attackers could have gained access to the social media account by simply compromising an associated corporate email account.

3.2.3 Administrator Device Review

a. Are there any anti-virus alerts that would indicate the authorized devices used to make social media posts have been compromised? Malware could be used to harvest credentials or session tokens and then used to piggyback on established sessions or quietly log in to the social media site.

b. Are the operating systems and installed applications for the authorized devices identified in the preparation phase patched appropriately? An attacker may have taken advantage of an unpatched system or vulnerable application to gain administrative system privileges and then steal credentials.

c. Are all the authorized devices inventoried in the preparation phase accounted for? Access may have been obtained through stolen devices with already established sessions to the social media site.

4. Containment Phase

After an incident is identified through the triage of the identification phase, containment is then necessary to limit the damage caused by the attackers. "The goal of the containment phase is to stop the bleeding" (Skoudis, 2008). Initially, the containment objective of a social media security incident is to prevent further posts. Subsequently, containing is also about preserving data related to the attack so the business can pursue legal action or assist federal agencies if necessary.

Finally, the containment phase of a social media incident should include longer-term actions to regain full control of the service and ensure attackers no longer have access to the social media account. In conjunction with the technical efforts to "stop the bleeding", an often overlooked step of containment is also informing management and the business that there has been an incident. Together these four key steps are critical to a quick and effective containment strategy and should be an integral part of a social media incident runbook:

- Inform Management
- Prevent Further Damage
- Preserve Evidence
- Implement Longer Term Measures

4.1 Inform Management

When a social media incident has been identified, it is imperative to inform a manager, sponsor, or business executive identified during the preparation phase. Often, enterprise social media presence is highly visible and word will travel quickly if the pubic becomes aware of a compromise. No one wants to be blindsided regarding business incidents that might make the evening news, least of all executives and management. Therefore, it is imperative for the runbook to include a task to notify management or a security sponsor when an incident is declared. The social media incident handler will find more often than not that they will need senior leader assistance to gather the response team, notify executives, and prepare responses.

4.2 Prevent Further Damage

The information collected during the preparation and identification phases will be vital to the rapid containment of a social media incident and ultimately preventing further damage. For instance, if the account administrator is unable to reset the password of a compromised social media site, the incident handlers will likely need the social media service contact information. The handler can use this information to request the provider's help regaining control of the account. The social media runbook should include the following elements to initially stop the bleeding:

a. If the administrator is unable to login or recover the account password, contact the social media service provider for assistance using the collected details gathered in the preparation phase. Insist the account be locked so no further changes or access can be attempted.

b. If the administrator is able to access the account, grab a screenshot of active sessions (where possible) and end suspicious active sessions. Facebook provides this capability in the "Active Sessions" feature described in the identification phase above. Suspicious sessions can be terminated by simply clicking the "End Activity" link (see Figure 2).

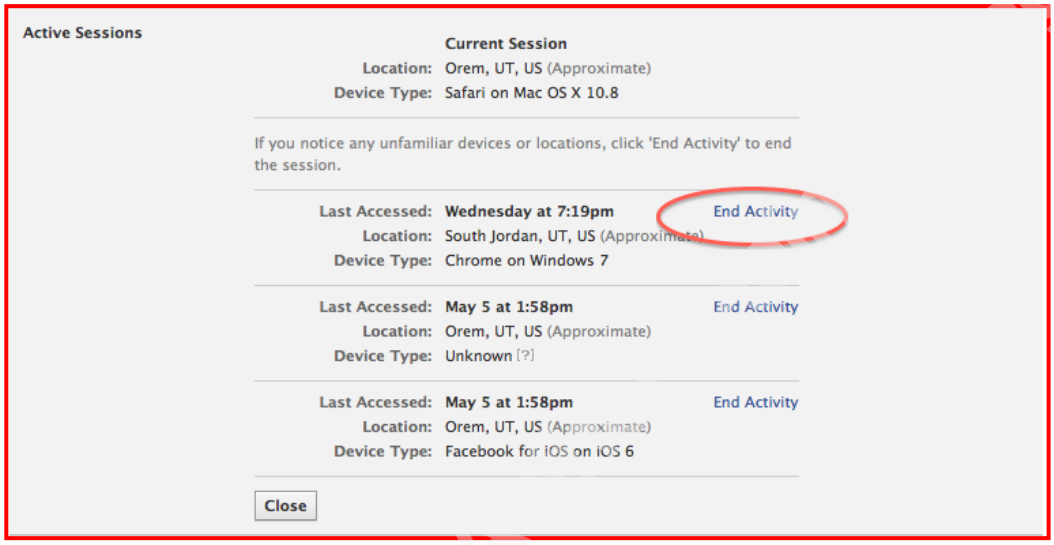

Figure 2

c. If possible, disconnect compromised devices used to access the social media service from the network (local network and cellular if using mobile devices).

4.2 Preserve Evidence

Another task in the incident runbook that should not be over looked is that of preserving evidence of the attack. This information can assist in legal actions or provide local federal agents with information that may aid in larger criminal investigations. Depending on the size and publicity of the incident, media outlets may use screenshots in their news articles. This will ensure that from their perspective historical evidence is preserved. However, incident handlers will not rely solely on the media community to document the incident. Instead, they will ensure preservation of details through tasks outlined in the runbook such as the following:

4.2.1 Screenshots of Account Settings and Activity

Where possible take screenshots of account settings, profiles, notification settings, password settings, activity logs, and lists of third party applications used to access the social media account (see Figures 3-5).

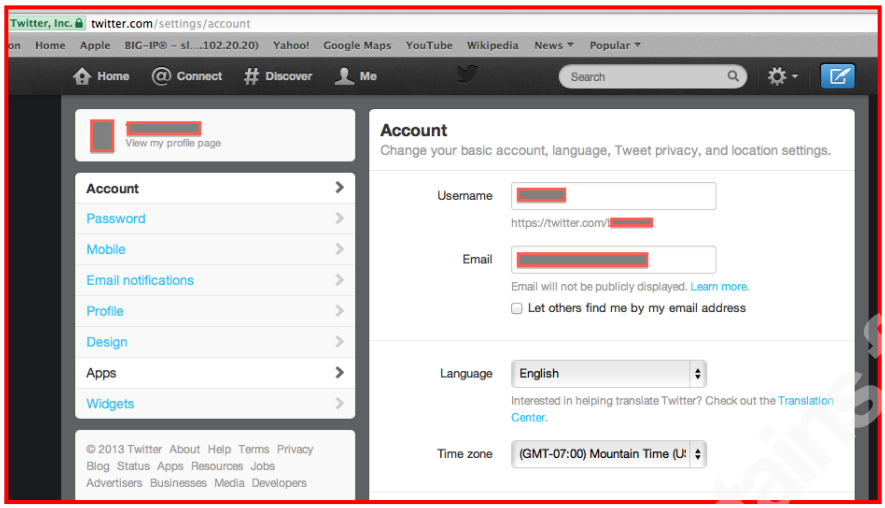

Figure 3

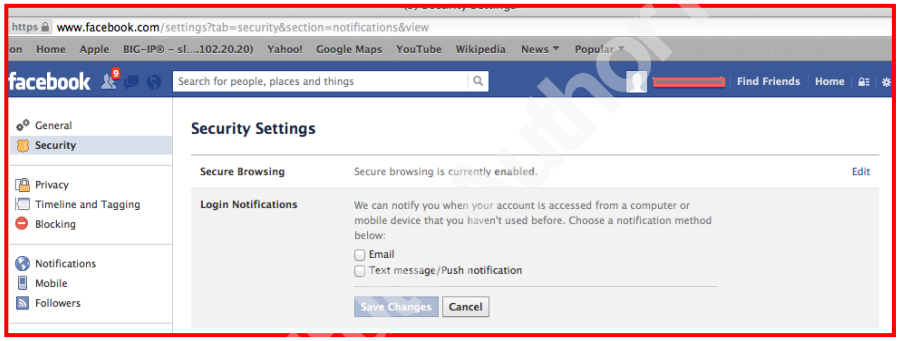

Figure 4

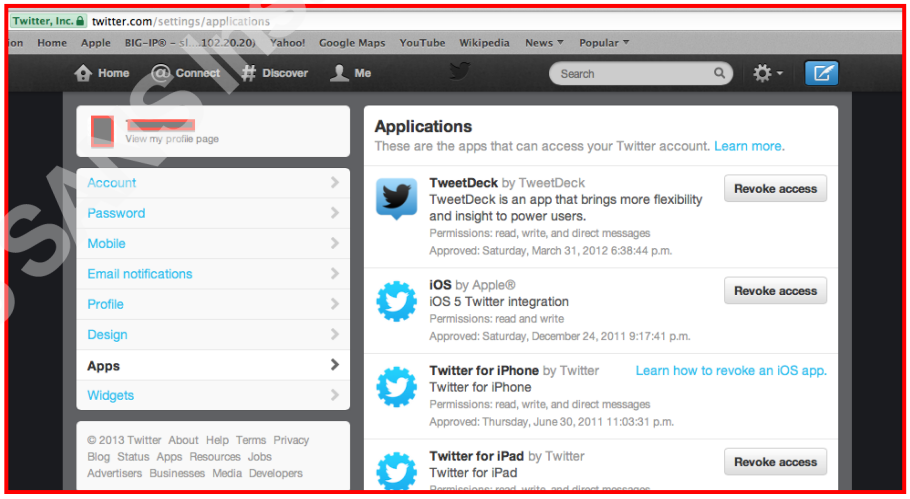

Figure 5

4.2.2 Timeline of Posts

Capture a sound timeline of account posts that are relevant to the incident. Some social

media services like Facebook provide a built-in "Activity Log" feature (see Figure 6) that allows a quick review all account posts, photos, likes, comments, etc.

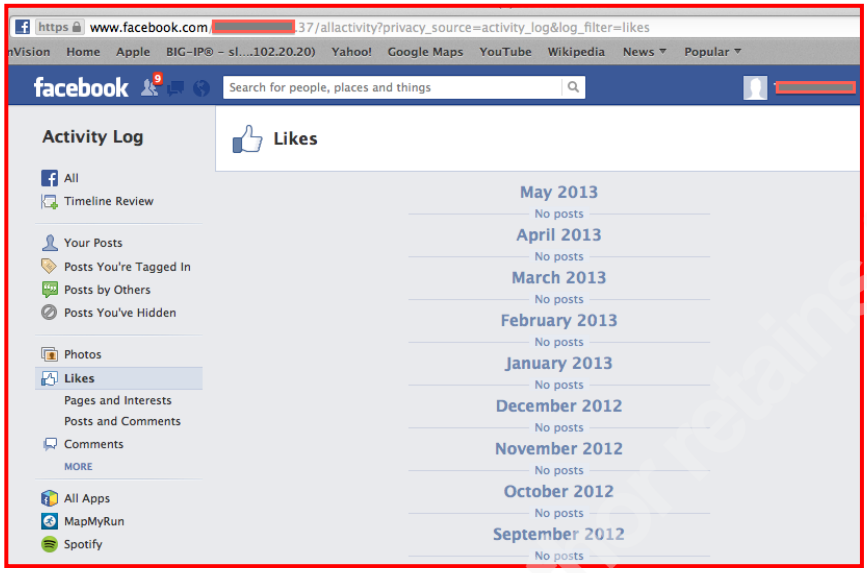

Figure 6

Other social media services, like Twitter, provide a way to request an "Archive" of every tweet starting at the beginning of the account (see Figure 7).

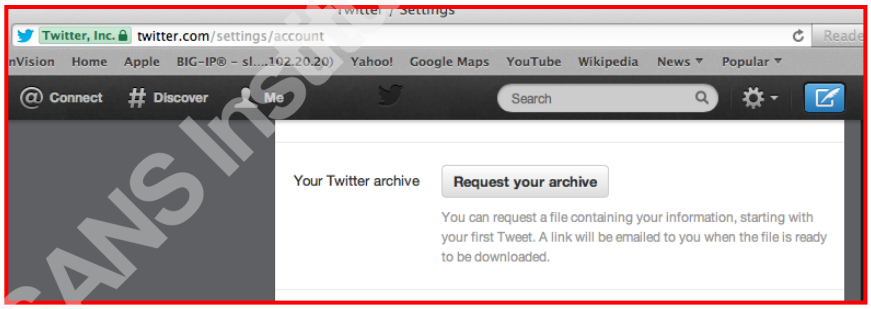

Figure 7

4.2.3 Forensic Image of Compromised Devices

When devices used by administrators to access the social media account are compromised, collect a forensic image of the device. This image can be further investigated if necessary in the eradication phase of incident handling.

4.3 Implement Longer-Term Measures

After steps have been taken to prevent further damage and preserve evidence, measures to

more permanently contain the incident should be addressed in the runbook. For instance, passwords should be changed; email accounts secured; third party social media management applications revoked; and vulnerable devices or applications should be patched.

4.3.1 Change Passwords

The single most effective action to regain control of a compromised social media account is to change the account password. If during the identification phase it was determined that the account password was easily guessable, it is vital that the incident handler ensure a highly unique, complex, strong password is chosen. Additionally, the handlers need to ensure the administrator does not use the same password used for other personal or corporate accounts.

Enable additional login and password reset security features provided by the vendor. For example, set up Facebook "Login Approvals" (see Figure 8). This feature recognizes authorized devices and prompts for a code, or second factor, when Facebook does not recognize the device (or browser). The code is sent via SMS or Facebook application to a mobile device to be used at login. If an attacker does not have access to a recognized device, they would be prompted for a login code but would not have it to continue the login.

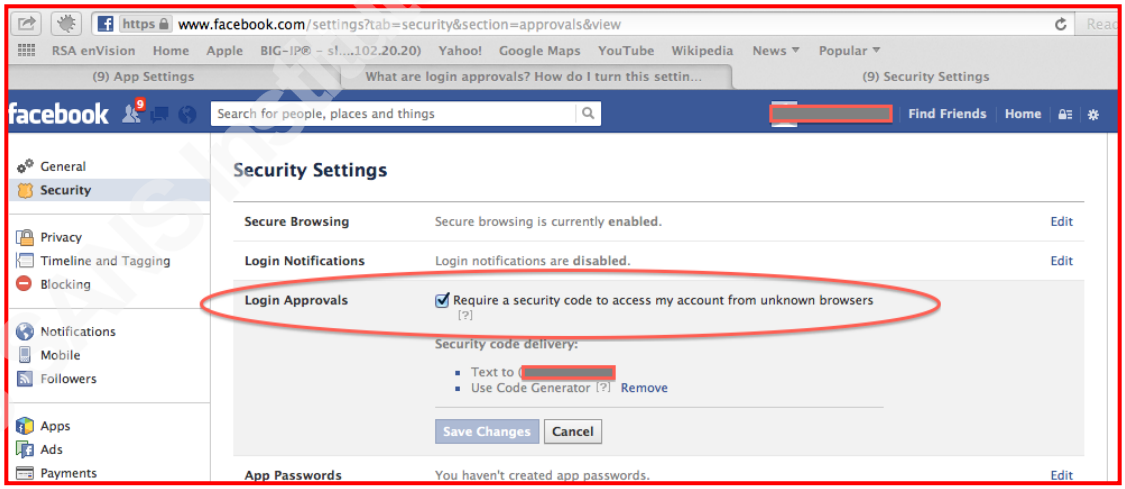

Figure 8

Some social media providers may even offer features such as "One-Time Passwords" that could be used until the incident has been fully contained. Facebook offers this service if there is a mobile device attached to the account. If the mobile device has not been compromised, request one-time passwords by simply sending "a text message to 32665 with the message otp" (http://www.facebook.com/help/413023562082171/).

4.3.2 Secure Email Accounts

If the email account used to register for a social media service is compromised, the attacker can easily circumvent a strong social media password and change it using password recovery features. Work with the administrator to ensure the email account password used to set up the social media service has been changed, the email account is not a personal account, the password is complex, and the password is unique.

4.3.3 Disable or Revoke Third Party Apps

Some social media services such as Twitter and Facebook provide a way to see what third party applications have access to the social media account. These applications may be vulnerable to attacks or may handle the account credentials insecurely. Identify each third party application and disable or revoke. The applications for Facebook are listed in account settings under "Apps". They can then be removed by "editing" the application and then clicking on "Remove app" (see Figure 9). For Twitter, these third party applications are listed under "Apps" in account settings and they can be removed by simply clicking the "Revoke Access" button (see Figure 10).

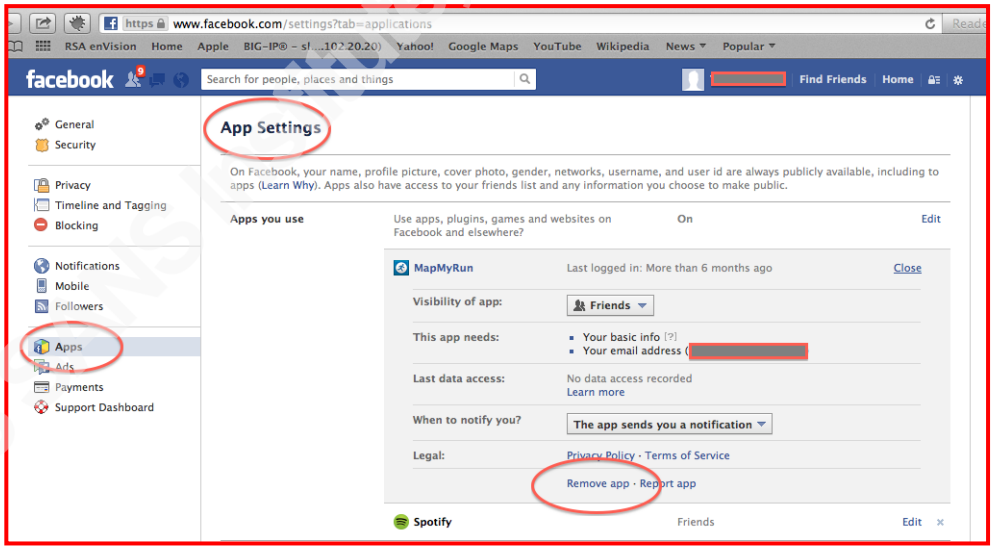

Figure 9

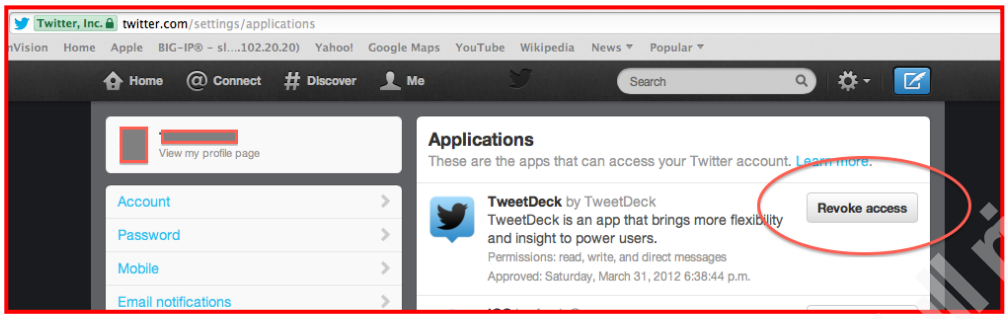

Figure 10

4.3.4 Secure Devices and Applications

As with other security incidents, the runbook should include specific tasks to review and patch the operating system of devices used by social media administrators. These tasks should also review and ensure there is a functioning firewall on authorized devices and that the anti-virus signatures are up to date. Additionally, there should be a specific task in the runbook to update potentially vulnerable supporting applications such as Java and Adobe products. Finally and most important, will be to ensure that the third party applications required to administer the social media site such as Hootsuite, Tweetdeck, etc. are properly patched and configured.

Incident handlers may find that these four containment steps cannot necessarily be done in contiguous order and instead may have to be done concurrently depending on the situation. No matter the order, the important objectives of the containment phase are to "stop the bleeding", communicate to management there has been a social media incident, and preserve evidence where possible.

5. Eradication Phase

Once initial triage has been performed and the "bleeding has stopped", the cleanup begins. "The goal of the eradication phase is to get rid of the attacker's artifacts" (Skoudis, 2008). This phase of the incident handling process can be somewhat tricky when dealing with a social media compromise. A traditional deep forensic investigation to identify related residue may not be possible. However, there are a few obvious tasks in a social media incident runbook that should be included such as the removal of unwanted posts and malware from infected administrator devices. In addition, the runbook should also cover the elimination of the more subtle artifacts such as inappropriate comments made on other sites or tasteless photo uploads. Moreover, any additional

defenses to improve technical security, processes, or technology should be reflected in the runbook during the eradication phase.

Start the eradication phase by cleaning up unwanted artifacts of the attack in the social media account including tweets, posts, uploaded videos, etc. For Twitter related incidents this can be done by going to the account profile, highlighting the tweet in question and then deleting it (see Figure 11). Unfortunately, for now it is not possible to delete others' retweets or to delete tweets in bulk.

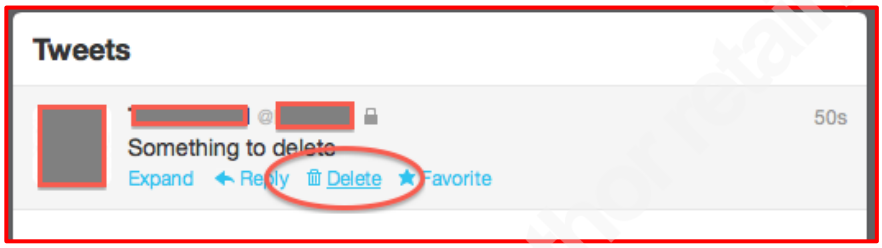

Figure 11

With Facebook, status posts can be removed by logging in and navigating to the account profile. Review the account timeline and find the posts that need to be removed (see Figure 12). Then click "delete".

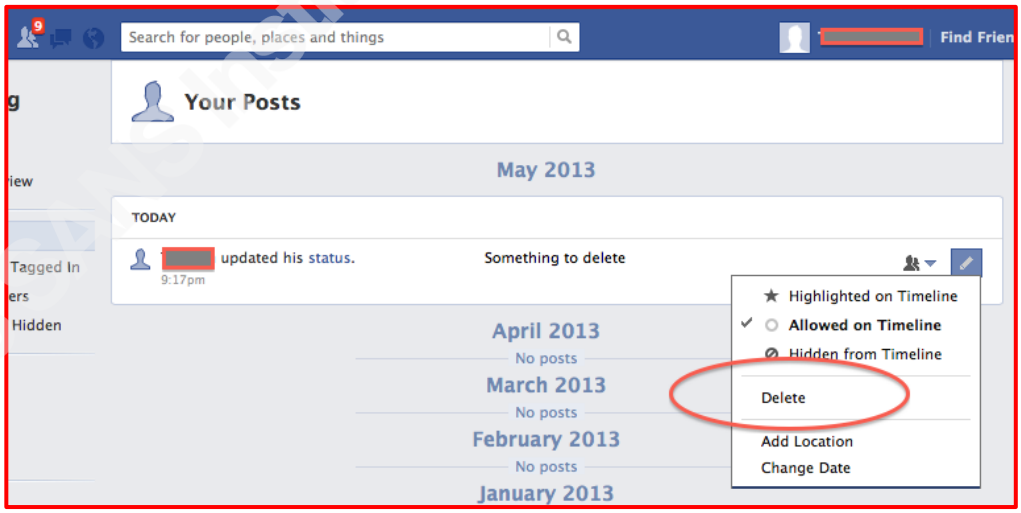

Figure 12

Care should be taken by incident handlers to be thorough during the eradication phase. Not only should obvious residue be sifted out but also the more subtle artifacts such as comments, photo uploads, and follows should be examined. An unidentified or overlooked inappropriate

image or a highly charged political comment could lead to further embarrassment for the organization after an incident. In the social media incident runbook, include specific tasks to review all uploaded images, comments made from the account, as well as accounts being followed.

Remember that removing all social media artifacts related to the incident is likely not practical. If the media picked up on the compromise or others reposted the attackers residue, the incident handlers will have to do their best to remove residue from the account. However it may not be possible to remove other posts, comments, etc. about the incident.

Besides cleaning up the social media account residue, runbook tasks should also include the removal of unwanted items from the administrator's corporate account and authorized devices. For example, any malicious or suspicious emails such as phishing emails that may have been instruments that led to the social media incident should be deleted. Additionally, include tasks to identify and filter nefarious web links that may have been sent during the attack. This will ensure they are not accidently used again or maliciously sent to another administrator.

Defense improvements should further be added while eradicating artifacts. If administrators were tricked into clicking links or installing malware, additional steps to sanitize all compromised devices are also required. Incident handlers should consider, rather than trying to dissect the forensic image to identify every attack artifact, to instead re-image the infected devices and apply hardened configuration baselines. Moreover, the anti-virus solution applied to administrator devices should be reviewed to ensure signatures are updated regularly. Lastly, scan the administrators' devices and loaded applications for vulnerabilities or misconfigurations that can be taken advantage of.

Less obvious tasks that may help improve defenses:

a. Have the social media administrators create and use a separate corporate email account specific for the use of social media administration.
b. Encourage the corporate messaging team to dial up the scoring of email phishing detection for social media related email accounts. This may increase the number of detected false positives but it will also help prevent phishing attacks that can lead to future compromises.
c. Have the social media admins set an account security question (where possible). If given the opportunity to create a unique question, assist the admins with selecting a good

question and answer that cannot be easily guessed or brute-forced. For example, Google provides this feature under "Account", then "Security", then "Your recovery options", and finally, "Security question". After clicking "edit", the user can write a unique question (see Figure 13).

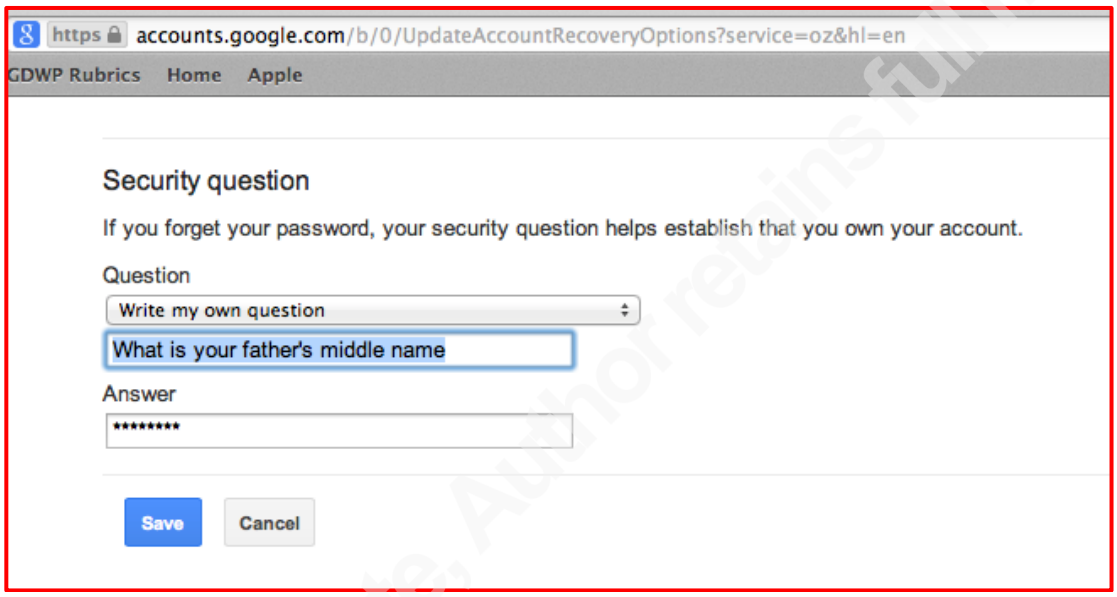

Figure 13

6. Recovery Phase

The objective of the recovery phase is to get back to normal operations where the social media administrators and moderators are posting and using the service again. Although measures have been implemented to contain the incident, improve defenses, and remove residue of the attack; specific measures should be taken by the incident handlers to carefully monitor the service as it is brought back online. "It is here that you ensure the incident did not permanently affect elements of the [social media service], and everything is as it was previous to the incident" (Kleiman, 2011).

Perhaps the first task to tackle during the recovery phase is for the administrator or moderators to post the pre-arranged incident notification approved during the preparation phase. Once the initial recovery message has been published, the third party applications that are typically used by the administrators can also be slowly re-enabled.

Though it's largely the administrators and moderators working to reestablish normalcy

during the recovery phase, the role of the incident handlers is to ensure the services, technologies, and processes are monitored carefully. This monitoring can be achieved through both active and passive runbook monitoring tasks.

6.1 Active Monitoring

Social media account activity such as posts, video uploads, comments, and follows can usually be monitored with built-in social media service features or simple tools such as Tweetdeck and Twilert. There are also commercial solutions such as DataSift that can provide a single filtered feed of all enterprise related social media content which can be easily monitored.

While actively monitoring during the recovery phase, incident handlers are constantly looking for attempts to re-compromise the social media account, the administrator, or technology used by the administrator. Handlers should partner with the social media administrators to watch for changes to the account settings, account logins from unauthorized devices, and suspicious content. Consider including in the social media incident runbook specific tasks to enable available social media "notification" alerts that can assist with monitoring, such as:

6.1.1 Account Change Notifications

Many of the suggested social media security features implemented during containment and eradication phases also provide a form of notification that will be important to monitor as part of the recovery phase. Besides these basic security notifications, consider turning on other notifications such as Facebook's "App requests and activity" feature to help with monitoring. This can be enabled by going to "Account Settings", then "Notification Settings", then selecting the notification method, and ultimately selecting the third party applications to receive notifications about (see Figure 14).

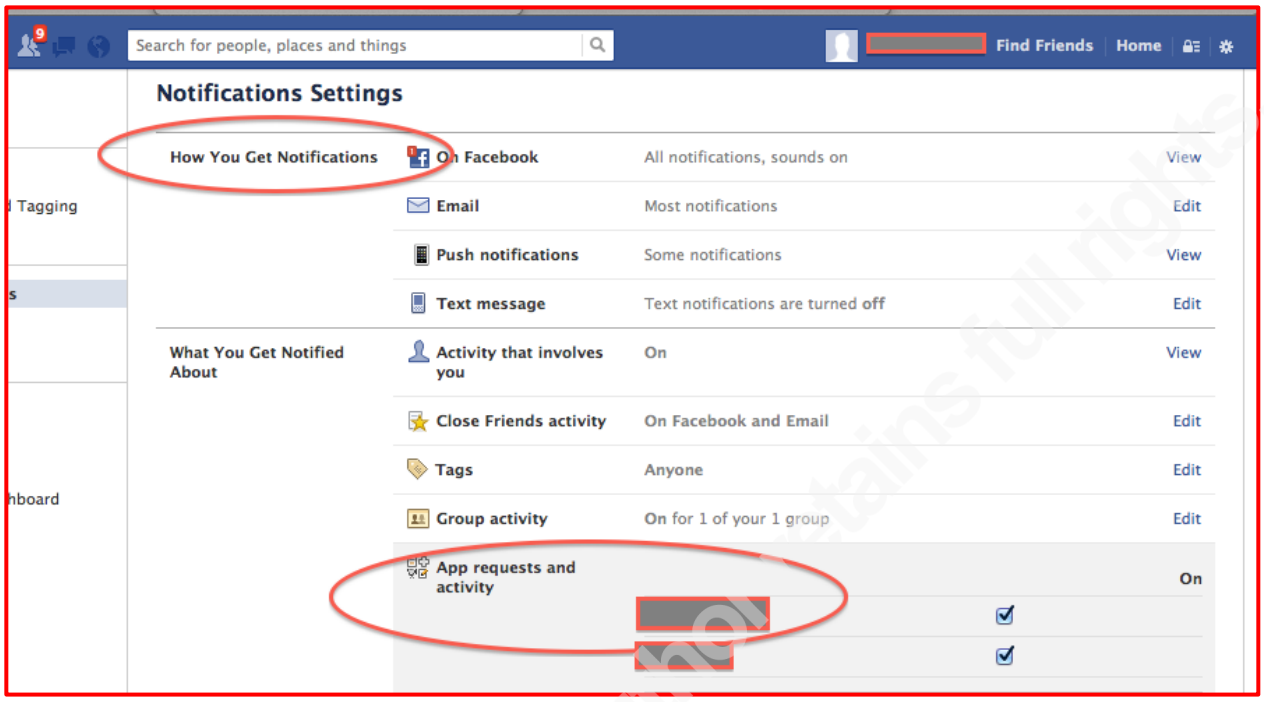

Figure 14

6.1.2 Login Notifications

As an example of login notifications, with Facebook, the administrator can enable these by going to "Account Settings", then "Security Settings", then "Login Notifications", and finally choosing the notification method (see Figure 15).

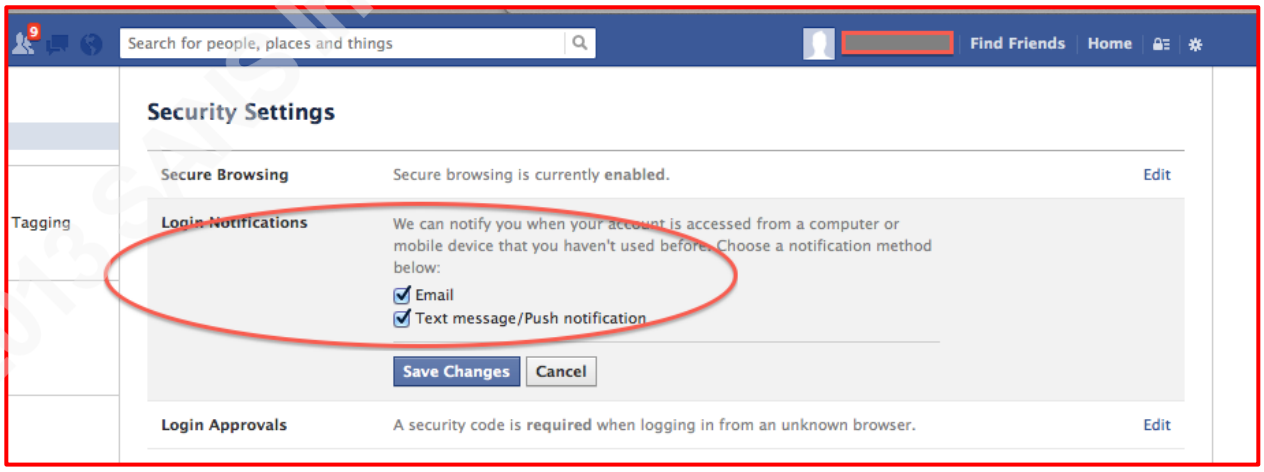

Figure 15

6.1.3 Post or Upload Notifications

From a separate social media account, follow the organization's social media account and

turn on post notifications for any new activity. Additionally, sometimes there are other helpful tools such as "YouTube Subscription Monitor" which is a Chrome plugin and can alert the incident handlers when there is a new video upload.

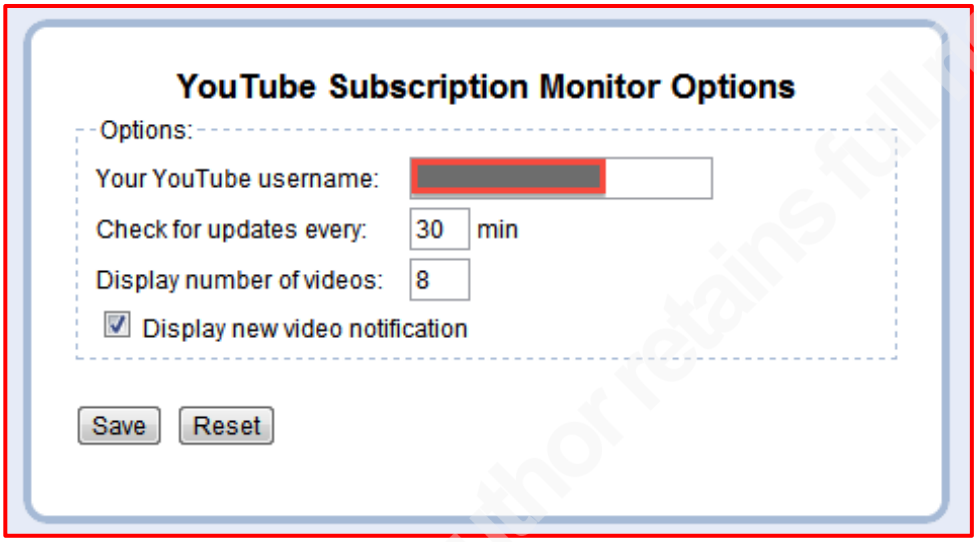

Figure 16

6.2 Passive Monitoring

Runbook monitoring actions that may be more passive in nature should also be incorporated. For example the enterprise anti-virus solution should be closely watched with regards to the administrators authorized devices. The incident handlers may also want to keep watch over popular password hash dumping grounds like "pastebin" for newly compromised accounts that may include enterprise social media administrators. Include tasks to monitor peripheral tools like web content monitoring to validate there are no longer attempts to known malicious sites. Finally, handlers should also keep an eye out for any third party application security updates that may need to be applied to prevent a re-compromise during the recovery phase.

7. Lessons Learned Phase

After a reasonable recovery period, incident handlers will know whether or not the organization has successfully recovered from a social media incident. Though incident handlers and the business may be tempted to call the incident handling complete after the recovery phase, there is still one crucial phase to accomplish, the lessons learned phase. The goal of the lessons

learned phase is to document what happened and look at how operations and capabilities can be improved (Skoudis, 2008). In his book "Corporate Management, Governance, and Ethics Best Practices", Vallabhaneni suggested that the lessons learned phase of an incident should also be used to "identify systemic security weaknesses and deficiencies in policies and procedures. (Vallabhaneni, 2008). The incident runbook would not be complete without specific tasks to pull the response team together (including the non-technical business units). The team should take the time to review the details of the incident itself, technical capabilities, and applicable processes. The following are examples of runbook tasks to help ensure the lessons learned phase is productive.

7.1 Review Incident Details

Schedule a meeting with the response team, taking special care to invite the non-technical business units to ensure everyone understands and knows the details of what happened. As a team answer the following questions:

- What was the social media security incident?
- Why was the social media service compromised?
- How was the social media service compromised?
- What measures or controls may have helped prevent the compromise?
- Is there technology that can be used to help enforce security measures and controls?

7.2 Improve Processes

In a separate meeting with the response team, review business processes related to the social media administrators and the technology they use. Make recommendations for governance improvements such as:

1. Establish policies about whom, when, and from what device official social business media posts can be made.
2. Establish documented processes to add or remove social media service administrators and then document procedures for updating the list of authorized devices.
3. Establish documented policies, processes, and procedures to manage all official social

media account passwords. Policies should include the required interval for change, who can know the passwords, how they will be stored, and what to do with the passwords when administrators are terminated or change roles.

4. Establish a process to review operational social media processes and the security incident runbook every six months.
5. Establish regular OS patching and application patching processes for authorized administrator devices and third party applications used to manage the social media service.
6. Establish processes to review and implement new security features offered by the social media service provider every few months.
7. Establish background check processes for administrators and moderators.

8. Conclusion

Social media is becoming a vital vector for enterprises and organizations to conduct business, build their brands, and provide information. As with most technology, this new business medium comes with growing cyber risks and responsible stakeholders are taking measures to protect their brands and reputation. Part of protecting a business's social media presence is with thoughtful and careful planning before an incident occurs. This includes pre-arranged incident handling procedures and responses such as a social media incident runbook. Applying the six proven phases of security incident handling from the perspective of a social media incident is an excellent guide to developing a custom incident runbook for every business with a social media presence (see sample runbook in Appendix A). When tailored specifically for the enterprise, these practical incident runbooks are a critical guide to handle future social media security incidents.

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10. Appendices

Sample Social Media Incident Runbook

Preparation Tasks

1. Document social media sites, administrator contact information, and authorized devices used by administrators. Also document incident response team contacts and their information.

Enterprise Social Media Accounts

Authorized Social Media Service	Service Support Phone/ Email	Account Username	Email Account Used to Register Service

Social Media Account Administrators (and Moderators)

Authorized Social Media Service	Authorized Administrator/ Moderators	Admin/ Moderator Contact Info	Notes

Authorized Devices used by Administrators

Authorized Administrator/ Moderators	Authorized Device Type	Device Information	Applications

Incident Response Team

Name	Responsibility	Phone	Email
	Business Executive over Social Media		
	Security Sponsor (CISO, ISO, etc.)		
	Public Relations		
	Local FBI Office		
	Legal Counsel		

2. Interview administrators and moderators regarding social media management and practices.
   a. What is the process used to manage the social media technology? Can posts or content changes be made from hotel kiosks or only from approved devices? Are there moderators who also have access to the social media accounts?
   b. What third party applications are used to manage the social media sites?
   c. What is the process for managing the account password of each social media site?
      i. Are they complex?
      ii. Are they safely stored?
      iii. Are they changed regularly?
      iv. Who knows them?
3. Work with public relations and legal counsel to establish a pre-arranged Social Media Incident Notification Message.

   Example ---
   "It has come to our attention that our account has been compromised. We are working directly with administrators to re-establish control. We apologize to our followers who have received erroneous or inappropriate messages."

   Prepared Date: 5-17-2013
   Executive Approval: 5-18-2013

Identification Tasks

1. Identify common indicators of compromise.
   a. Look for unexpected posts, tweets, video uploads, etc.
   b. Review available account activity for unexpected photo uploads, following, unfollowing, blocking, etc.
   c. Review available account notifications for email changes, profile changes, etc.
2. Identify other indicators of compromise.
   a. Account Assessment
      Review available social media "Active Sessions" for suspicious location, IP address, or

device type.

b. Administrator Assessment
    i. Review corporate email filtering solutions for indications the social media administrator may have fallen victim to phishing attack.
    ii. Review corporate web content filtering solutions for indications the social media administrator may have fallen victim to a malicious website drive-by.
    iii. Review corporate authentication directory log data for indications that the social media administrator's account may have been brute forced.
c. Administrator Device Review
    i. Review corporate anti-virus solutions for events or alerts tied to administrator authorized device(s).
    ii. Review the operating system and application patch levels for indications that administrator authorized device(s) are vulnerable.
    iii. Ensure all authorized devices are accounted for.

Containment Tasks

1. Inform management and business of social media incident.
2. Prevent Further Damage:
    a. Request the assistance of the social media service provider to prevent additional changes.
    b. End suspicious active sessions (where possible).
    c. Disconnect compromised administrator compromised devices from the networks.
3. Preserve Evidence
    a. Screenshot account settings and activity logs such as:
        i. Profile settings
        ii. Notification settings
        iii. Password settings
        iv. Third party app settings
    b. Document an account activity timeline, including:
        i. Posts
        ii. Photos

iii. "Comments"
iv. Likes, follows, unfollows

c. Secure a forensic image of any compromised authorized devices.

4. Longer Term Measures
   a. Change Passwords (this may be necessary even in the short term)

      Change social media account password

      - Complex
      - Unique
      - Strong

   b. Enable additional login and password reset features (where possible).
      i. Enable two-factor authentication (where possible).
      ii. Use one time passwords (where possible) such as Facebook "One Time Passwords"
      iii. Enable email verification for password resets
   c. Secure Email Accounts associated with Social Media account.

      Change email account passwords and ensure they are:

      - Complex
      - Unique
      - Strong

   d. Disable or remove third party applications used to manage the social media account.
   e. Secure devices and applications used to manage the account.
      i. Patch and harden the operating systems of authorized devices.
      ii. Patch applications like Hootsuite and Tweetdeck used to manage social media accounts.
      iii. Patch and harden other applications on administrator devices such as Java and Adobe products.

Eradication Tasks

1. Clean up unwanted attack artifacts from the social media account including:
   a. Obvious - posts/tweets/videos

   b. More subtle - photos, comments, follows, etc.
2. Clean up unwanted attack artifacts from administrator corporate accounts

   Remove malicious emails from admins account - phishing attacks, malicious links, etc.
3. Further improve defenses:
   a. Re-image compromised devices with hardened baseline configuration.
   b. Install and update AV solution.
   c. Vulnerability scan authorized devices to ensure there no obvious weaknesses.
   d. Setup a separate email account specific to the social media service.
   e. Dial up email phishing detection to identify and quarantine suspicious emails targeted at social media administrators.
   f. Set account security questions (where possible).

Recovery Tasks

1. Post the pre-arranged incident notification.
2. Active Monitoring:
   a. Setup and monitor social media account change notifications (where possible).
   b. Setup and monitor account login notifications.
   c. Setup and monitor account post/upload notifications.
3. Passive Monitoring:
   a. Monitor corporate solution for anti-virus alerts or events on devices used by social media administrators.
   b. Monitor and search common password (and password hashes) dumping grounds like "pastebin" for credentials related to the social media account.
   c. Monitor web-filtering tools for attempts to access malicious/nefarious URIs and domains.
   d. Monitor for security updates to third party applications used access the social media account.

Lessons Learned Tasks

1. Review incident details with administrators and the incident response team and answer the following questions:
   - What was the social media security incident?
   - Why was the social media service compromised?
   - How was the social media service compromised?
   - What measures or controls may have helped prevent the compromise?
   - Is there technology that can be used to help enforce security measures and controls?
2. Review business processes related to the social media administrators and the technology they use.
   - Establish policies about whom, when, and from what device official social business media posts can be made.
   - Establish documented processes to add or remove social media service administrators and then document procedures for updating the list of authorized devices.
   - Establish documented policies, processes, and procedures to manage all official social media account passwords. Policies should include the required interval for change, who can know the passwords, how they are to be stored, and what to do with the passwords when administrator's are terminated or change roles.
   - Establish a process to review operational social media processes and the security incident runbook every 6 months.
   - Establish regular OS patching and application patching processes for authorized administrator devices and third party applications used to manage the social media service.
   - Establish processes to review and implement new security features offered by the social media service provider every few months.
   - Establish background check processes for administrators and moderators.