What Organizations Must Know about Ransomware

In late 2015, security experts predicted that 2016 would be the year of online extortion. They were right. There has been a 300% increase in online extortion this year. It is anticipated that over one million US businesses will be infected with ransomware by the end of this year.

Ransomware prohibits computer users from accessing their digital files by encrypting, or password protecting, the files with a key known only to the hacker. The hacker prevents the files from being recovered until a ransom is paid for the encryption key. Downtime associated to infection and cost of recovery are the consequences of a ransomware infection, but the consequences are far greater for those working directly in the healthcare industry and the business associates who support them.

Ransomware is unlike any virus you are accustomed to. It is not an attack on computer systems – it is an attack on human vulnerabilities. These sophisticated viruses prey on human mistakes in order to take control of your organization. These threats require *just one* user to make *just one* ill-fated mouse click. That *one* click could be devastating to your entire organization.

This white paper provides information about the ransomware threat including steps to reduce the likelihood of a ransomware infection.

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The Ransomware Threat

There are 390,000 (Paganini, 2015) new variations of malicious software (malware) released by hackers into cyberspace every single day. This equates to roughly twelve million new variations per month. A malware variant is a modified version of an existing piece of malicious software. That software is altered enough to prevent its detection from anti-virus and anti-malware security solutions. It now takes thirty to sixty days for anti-virus software providers to respond with updated signatures to recognize and stop new variants due to the large volume of threats developed daily. As a result, in any given week, computer users find themselves unprotected from millions of new variants that cannot be detected by their security software.

Ransomware is dangerous because it is untargeted. Attacks are broad in nature and threatens to infect any individual who uses the internet. This is an attack is on human beings and their vulnerabilities. It is relatively easy to protect computer systems from attacks. Protecting humans from themselves is much, much more difficult. (As healthcare providers, you are probably very familiar with that.)

What is Ransomware?

Ransomware is a form of malicious software developed to restrict user's access to their data until a ransom is paid to the hacker in exchange for a decryption key to unlock the files. Ransomware infects all files it is able to gain access to such as image files (jpeg, tif, etc), Adobe PDF documents, Microsoft Office generated files (such as Word, Excel and PowerPoint files) and other files that computer users have direct access to.

Ransoms are usually demanded in bitcoin, a form of cryptocurrency or digital money that is very difficult to track. In addition, a time limit is imposed upon the victim – generally a period of 24 hours from the time the malware encrypts the file. If the victim fails to pay the ransom (or successfully restore their data from their own backup solutions), the key is destroyed and access to the files is lost forever.

Unlike traditional viruses, the hacker is completely uninterested in the contents of the files they attack. These individuals are not trying to obtain your corporate data. They are not trying to steal corporate credit cards or bank information. A ransomware infection is a quick and dirty extortion attempt that aims to take advantage of a corporation's reliance upon their digital files in hopes that the organization lacks sufficient recovery tools thus forcing them to pay a funds to regain access to their data.

How Does Ransomware Get On My PC?

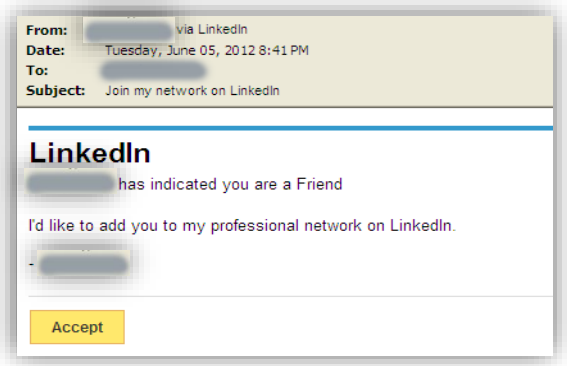
If an organization is to reduce its risk of becoming infected with ransomware, its users must have an understanding of how ransomware exploits human error to gain access to the user's computer files.

Email

Most commonly, ransomware is distributed by email to unsuspecting emails users. These emails are sent in bulk to user databases that have been mined or purchased with one goal: to defraud the recipient. This practice is known as phishing. To the untrained eye, the emails often appear to be legitimate. Below is an introduction to common phishing schemes used today to distribute ransomware and other forms of malicious software:

Social Media Malware Campaign

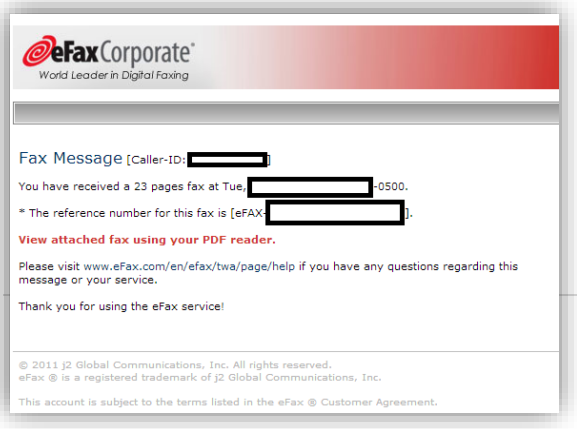
The security team at IBM recently witnessed a malware campaign that targets LinkedIn users. The process begins with a simple connection request sent to the victim's inbox. The email looks very similar to a legitimate LinkedIn connection invitation. Following are two examples:

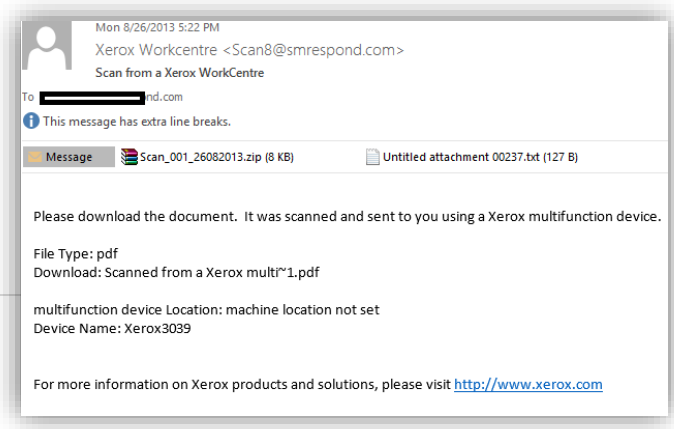


The email on the left is the fake. The email on the right is a legitimate connection request. It is not possible to determine the real request from the fake request by visual inspection of these images, alone. Inspection of the URLs associated to the call to action buttons in the email provide additional intelligence regarding the validity of the email messages, but that, too, is not a fool proof method of protection. Best practice for responding to social media requests is to accept connection requests from within your social media accounts, not from emails that may (or may not) be generated from those accounts.

Fax/Scan Malware Campaign

The use of faxing and scanning is prevalent in the modern workplace. Cyber criminals have created phishing emails that look like the eFax and Scan notifications that are commonly seen in the work place. Below are two examples. Both of these notices contained links or attachments that contained malicious software.





Be mindful of the generic emails you receive regarding fax and scan files. If your organization does not receive faxes or scans by email, delete them. If you are a practice that commonly received eFax and Scan notices by email, be diligent in verifying the sender prior to clicking on a link or attachment.

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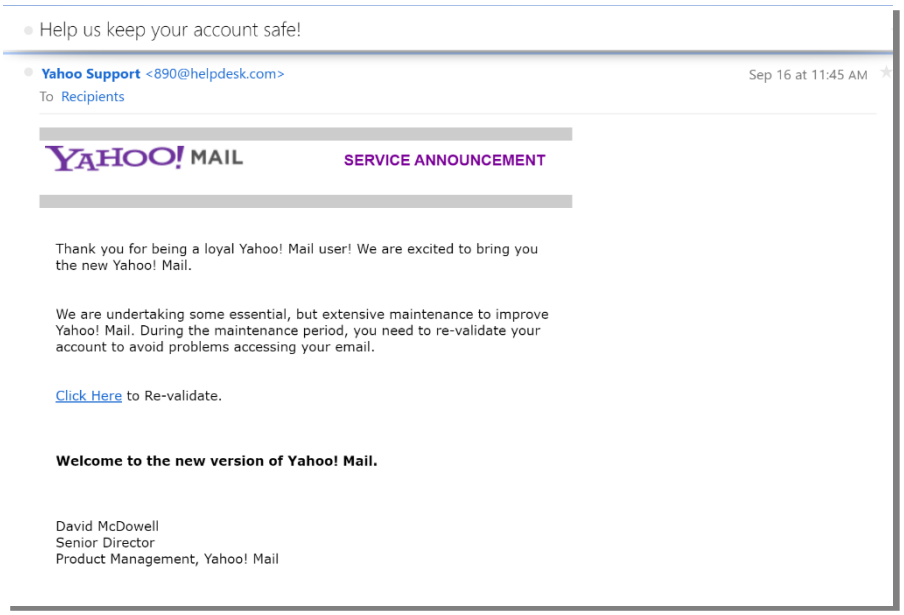
Generic Focused Malware Campaign

This is a phishing attempt that was engineered specifically for the Yahoo mail users:



Help us keep your account safe!

Yahoo Support <890@helpdesk.com> Sep 16 at 11:45 AM
To Recipients

YAHOO! MAIL **SERVICE ANNOUNCEMENT**

Thank you for being a loyal Yahoo! Mail user! We are excited to bring you the new Yahoo! Mail.

We are undertaking some essential, but extensive maintenance to improve Yahoo! Mail. During the maintenance period, you need to re-validate your account to avoid problems accessing your email.

Click Here to Re-validate.

Welcome to the new version of Yahoo! Mail.

David McDowell
Senior Director
Product Management, Yahoo! Mail

There are over 280 million active Yahoo Mail Users (Smith, 2016), many of whom will believe this is a legitimate service alert. This sort of campaign is very easy for a hacker to generate with software that automates the creation of these personalized spam

messages. You must be educated as to how to recognize these messages as fakes. (In the example above, the sender's email address proves this to be a fake.)

Spear Phishing Malware Campaign

A spear phishing attack is a targeted attempt to defraud an individual by posing as someone that he or she knows. You may be thinking "my practice is too small to be a victim of an attack like this." We have seen companies with as few as three employees receive spear phishing emails. In reality, these emails are incredibly easy to fake. Today's sophisticated data and contact mining tools available on the internet (many of them at no charge) provide hackers with everything they need to automate the creation these with relative ease and minimal time.

This is an example of a spear phishing email attempt:

In this example the email was sent from an HR Manager to his Payroll Clerk claiming to have attached a PDF of a salaries document. The document contains malware and was not, in fact, generated by the HR Manager.

The lesson here is a difficult one to enforce, but is critical to the protection of your computer users. Do not open an attachment you are not expecting, even if you think you know the sender.

Malicious Websites

Another common way that ransomware makes its way to your PC is through "drive by downloads" from shady websites. A drive-by-download attack does not require a user to click on an attachment as with email delivery techniques. These attacks are the result of a sophisticated hacker who is able to embed hidden code into a malicious website. The code executes the download of ransomware to the user's PC when the user merely visits the website containing the virus.

To avoid this type of attack, inspect website addresses thoroughly. Never click on a web link sent to you by email from an unknown sender (or, for that matter, from a known sender if the website address looks suspicious or the email is in any way unusual).

Do not be fooled by thinking that malware can only be found on "shady" websites. Affiliate links on popular website have been known to contain malicious code.

Pirated Software

It should go without saying that you should never, ever install software that you do not obtain through legitimate means. When you use pirated software you are not only breaking the law and infringing on the copyright of the software manufacturer, but you are also putting yourself at serious risk of downloading ransomware.

How Do I Defend Against a Ransomware Infection

There is not a product or service available today that can 100% protect you from a ransomware infection. The number of new malware variants engineered each day

makes it impossible today for software developers to create a solution that can guarantee protection. Fortunately, there are steps you can take proactively to significantly reduce your risk of a ransomware infection.

Backup and Disaster Recovery

First and foremost, you must be certain that you have adequate backups of your computer systems and data.

Not all backup solutions are created equal. You must consider *what* you are backing up, *how often* you are backing up that data, and most importantly, **you must test your backups**. A backup report that shows no faults is not a guarantee that your data is adequately protected from disaster. You must know with certainty that your backup system will prevent you from having to pay the ransom associated to a ransomware attack. The only way to be certain of this, is to test your system. Do not wait until you have to restore a backup to learn whether or not you were adequately protected.

Finally, you must have a clear understanding of where your backups are stored and who can access them. Ransomware infects all files accessible to the user who initiates the infection. Are your backups at risk of infection?

Train Your Staff

Your employees are your computer network's most significant liability. A recent Verizon wireless survey showed that 30% of email users will open a phishing message they receive and 12% of targets will open a malicious attachment or click on a malicious link (Verizon, 2016). Think about that. How many employees do you have in your organization? One out of twelve of those individuals will unwittingly expose your workplace to ransomware (even with training).

You must train and retrain your staff often. Make cyber security part of your workplace culture. Your goal with training is to help people who are ignorant become better informed about the *consequences* of their actions.

Create policies and procedures regarding the use of IT resources, especially email. Ensure you provide adequate training to your staff about those policies. Give your employees real life examples the ways they can be fooled by cyber criminals. Teach them how to verify the emails they receive are valid and best practices for handling emails related to social media requests.

Train, train and retrain often.

How Can I Obtain Assistance in My Defense Against Ransomware?

Ransomware poses a significant threat to your organization. The financial impact of an infection, even if you recovery quickly and are not forced to pay the ransom, can cripple if not devastate your organization. For assistance in developing your defense against ransomware, contact us at (270) 908-4136.

Founded in 2004, Kalleo Technologies is a managed IT service provider specializing in highly efficient, remote managed systems. Kalleo's professionals have extensive knowledge of the challenges facing organizations nationwide. We currently provide support for over 5,000 endpoints for clients in 28 states. Learn more at www.kalleo.net.

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