Cybersecurity and Innovation:

Important global politics and technology matters pertaining to the Internet @AfICTA Summit 2018

By Dr Jimson Olufuye

(fncs, CISA, CISM, CRISC, PRINCE2, Ph.D.)

CEO, Kontemporary Konsulting

Chair, AfICTA - Africa ICT Alliance

Vice-Chair, Business Constituency, ICANN

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Introduction

As research by international development organizations such as the World Bank, underscored the importance of Information and Communication Technologies for economic growth and development in the 90s, ...

Introduction

... so was the World Summits on Information Society (WSIS) were convened in Geneva in 2003 and in Tunis in 2005.

Introduction

Significant outcomes of WSIS included the establishment of the Internet Governance Forum (IGF) which has been running yearly since 2006 (the current edition takes place in Paris from November 12-14, 2018) ...

Introduction

... and the outlining of Action line tasks for which cybersecurity and the need to engender innovation for the desired information society were important areas of interest.

Introduction

Right from 2006, the need for the conversation on cybersecurity, innovation, privacy and many other Internet Governance (IG) subject matters to take place also at the national level was consistently highlighted and...

Introduction

... it has resulted in the proliferation of the national and regional IGFs across the world of which the annual Kenya & Nigeria IGFs are cases in point. It is desirable to mention that the result of that effort is the eventual passage of the Nigerian Cybercrime Act 2015, ...

Introduction

... the articulation of the Nigeria National Cybersecurity Policy and Strategy with the establishment of the National Cybersecurity Advisory Council under the Office of the National Security Adviser.

Introduction

Another outcome of WSIS was the establishment by the United Nations of the Working Group on Enhanced Cooperation on Public Policy matters pertaining to the Internet in 2013-2014 & 2016-2018 ...

Introduction

… to discuss how to govern Internet matters including cybersecurity at the global level.

Unfortunately, all efforts to have a consensus report failed as delegates could not agree on the mechanism to address IG issues at the UN level...

Introduction

Today, more than 3.5 billion people are connected to the Internet and with it increasing number of businesses and services are moving on-line thereby spurring economic growth with improved service delivery. This trend is projected to continue.

Introduction

...In the face of clear evidence of value adds of online presence are Internet related issues, crimes and infringements etc which needed to be addressed. Hence, the focus on cybersecurity and the need for innovative solutions to tackling related crimes.

Definition

What is Cybersecurity? From my perspective, cybersecurity is providing assurance from abuse, theft and misuse of resources on the Internet.

What is Innovation? Innovation is finding new and more efficient ways of getting a job done.

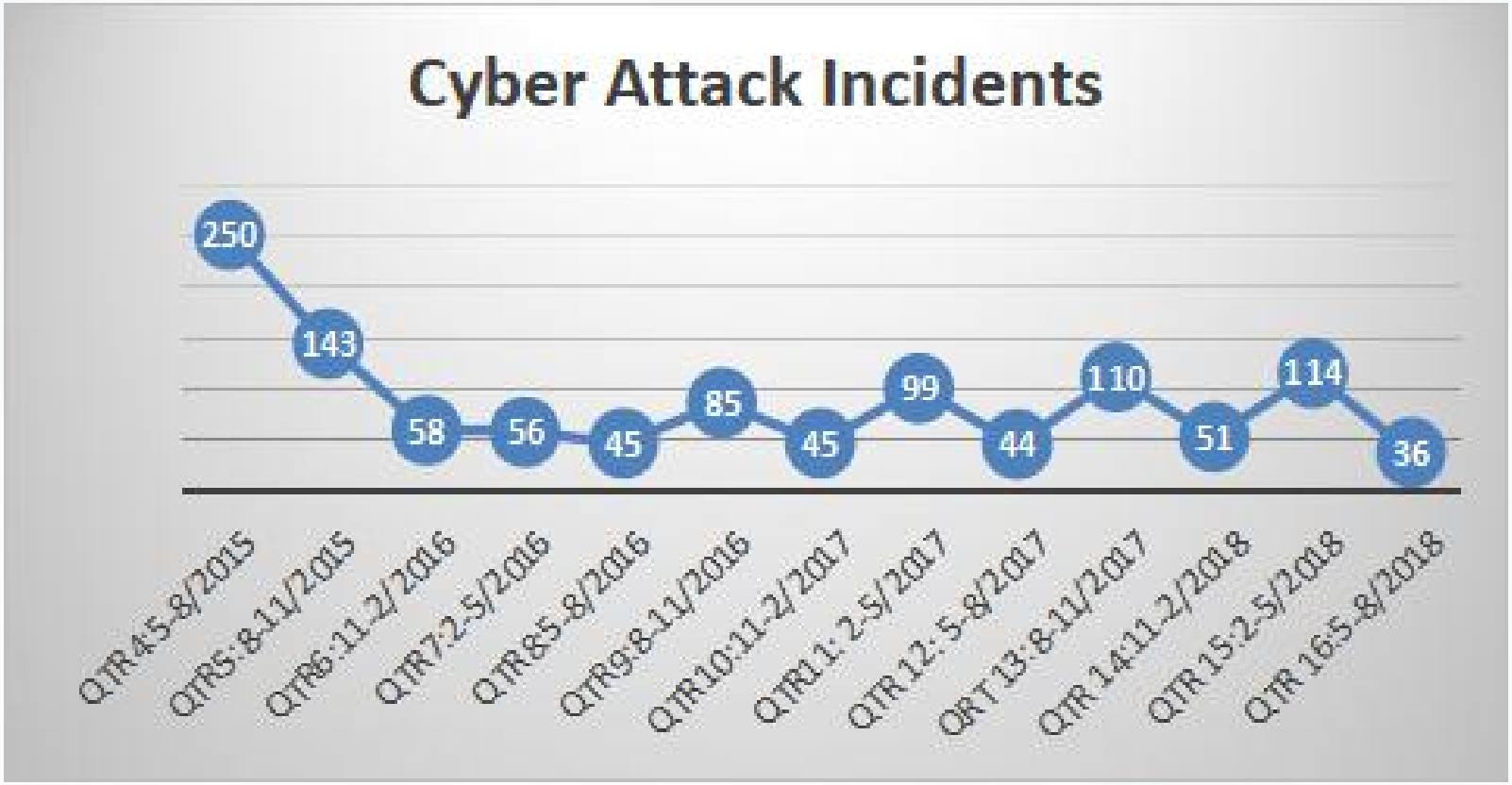
The Cybersecurity challenge and innovative ways to address the challenge

On the average there were 80 to 90 million cybersecurity events that occurred with close to 400 new threats every minute, and up to 70 percent of attacks going undetected according to data from 2015.

The Cybersecurity challenge and innovative ways to address the challenge

Bombshell hacks were revealed one after another in 2017, from an Equifax breach that compromised almost half of the US to global ransom campaigns that cost companies millions of dollars. The cyberattacks highlighted the alarming vulnerability of our personal information.

Attack scenarios on a K2 managed server



The Cybersecurity challenge and innovative ways to address the challenge

More tools used by government hackers have become public, and it's easier than ever to create sophisticated ways to spread malware or ransomware or steal data from companies. Companies also frequently fail to patch security flaws in a timely manner.

The Cybersecurity challenge and innovative ways to address the challenge

The world of cyber security is constantly adapting and growing as new technologies present themselves. This ever-changing industry has to think on its feet as new threats emerge so that data can remain safe and user confidence can remain assured.

The Cybersecurity challenge and innovative ways to address the challenge

And in addressing the challenge, global spending in the cyber-security sector was up to $90 billion in 2017.

The Cybersecurity challenge and innovative ways to address the challenge

Gartner Inc., one of the world's leading research and advisory companies, actually predicted that worldwide spending in cyber-security is poised to reach $170 billion by 2020.

What are the types of Cybersecurity challenges?

Cybersecurity challenges are diverse. They include domain hijacking, phishing, phamming, Distributed Denial of Service Attack (DDOS), Ransom DOS, spamming, IP blacklisting, security breaches, man-in-the-middle-attack, Password theft, SQL injection, the human element etc.

Some Measures to take to address the challenges

Sn	Type of Cybersecurity Challenge	Solution	Remark/Others
1	Domain hijacking or theft. Stealing of a domain or over writing the DNS Zone on a given computer usually through malware (Phamming).	-Use strong email passwords and enable two/multi-factor authentication if available. -Disable POP if your email provider is able to use a different protocol. -Tick the setting "always use https" under email options. -Beware of the site you visit and use good anti-malware app.	-Make sure to renew your domain registration in a timely manner—with timely payments and register them for at least five (5) years. -Use a domain-name registrar that offers enhanced transfer protection, i.e., “domain locking” and even consider paying for registry locking. -Makes sure your WHOIS information is up-to-date and really points to you and you only. -Relief via the Inter-Registrar Dispute Resolution Process

Some Measures to take to address the challenges

Sn	Type of Cybersecurity Challenge	Solution	Remark/Others
2	DNS Cache poisoning or DNS spoofing. This is hacking/ corrupting DNS resolver's cache, causing the name server to return an incorrect result record, e.g. an IP address. This results in traffic being diverted to the attacker's computer (or any other computer).	DNSSEC signing by registry & registrars	Domain Name System Security Extension was developed by IETF. It protects IPs and any data published in the DNS, including text records (TXT) and mail exchange records (MX), and can be used to bootstrap other security systems that publish references to cryptographic certificates stored in the DNS such as Certificate Records

Some Measures to take to address the challenges

Sn	Type of Cybersecurity Challenge	Solution	Remark/Others
3	Phishing (diversion to fictitious site through cloned email message with links for personal information harvesting).	-Increase awareness on email sender identification. -Follow/visit only trusted link	the #1 delivery vehicle for most malware 1 in 131 emails contained malware in 2016, the highest rate in 5 years.
4	DDOS Distributed Denial of Service Attack.	-IP filtering. -IP Blacklisting. -Change of device default passwords.	International cooperation for cross border enforcement is necessary (recent US law change to facilitate the apprehension of offending criminal and server)

Some Measures to take to address the challenges

Sn	Type of Cybersecurity Challenge	Solution	Remark/Others
5	RDOS -Ransom Denial of Service Attack	-IP filtering. -IP Blacklisting. -Change of device default passwords.	International cooperation for cross border enforcement is necessary (recent US law change to facilitate the apprehension offending criminal and server)
6	Spamming	-Email exchange score/relay configuration -IP blacklisting-Spam assassin-GDPR +&-	ITU, ICANN, registries and registrars among others are at the forefront of containing the spamming epidemic though differentiating for legitimate business marketing is a challenge.

Some Measures to take to address the challenges

Sn	Type of Cybersecurity Challenge	Solution	Remark/Others
7	Email/website hijacking	-Set strong password and change same periodically, -Patch software -Activate 2/multi-factor Authentication where possible -Step up security policy	
8	IP Blacklisting	-Reverse DNS -Proper Zone configuration, spam prevention measure e.g. deactivation of email forwarding.	Email delivery from host to external domains (e.g. google, hotmail) is blocked.

Some Measures to take to address the challenges

Sn	Type of Cybersecurity Challenge	Solution	Remark/Others
8	IP Blacklisting	-Reverse DNS -Proper Zone configuration, -spam prevention measure e.g. deactivation of email forwarding.	Email delivery from host to external domains (e.g. google, hotmail) is blocked.
9	Security breaches	-Patch software to block vulnerabilities -Use strong passwords	
10	Man-in-the-middle-attack	-Use PKI -SSL encryption	

Some Measures to take to address the challenges

Sn	Type of Cybersecurity Challenge	Solution	Remark/Others
11	Password theft	-Use strong but easy to recall passwords -Beware of social engineering-Use only your system for financial transactions-Submit financial info only on trusted websites-Never safe credentials online	Something like this c.*%7(:wQ,28{T^7 is good but can you remember it without writing it down?Never reuse passwords.Use this site to check how difficult to crack your password is: https://howsecureismypassword.net/
12	SQL injection	Use proper coding methods with strict formatting.	

Some Measures to take to address the challenges

Sn	Type of Cybersecurity Challenge	Solution	Remark/Others
13	Malware (Spyware, Trojan Horse, keystroke logger etc)	-Be uptodate with your Internet securities and be sure of the vendor product that you use. - Scan your system all the time. -To prevent audio/visual hack, block your mic and camera. -Follow/visit only trusted link -When not in use turn off wifi button on your system or router. -Do not allow unverified USB on your system	In certain cases, to resolve malware issues require restoring from last good backup may be an option.

Some Measures to take to address the challenges

Sn	Type of Cybersecurity Challenge	Solution	Remark/Others
14	Cybersquatting(registering a domain to cash in on the IP owner later)	Protection of critical domain on new TLDs	Microsoft has more than 50,000 domains on its belt.

Some Measures to take to address the challenges

Sn	Type of Cybersecurity Challenge	Solution	Remark/Others
15	The Human element	Invest in security awareness and in an educated workforce.-	The 2016 Cyber Security Intelligence Index from IBM found that a whopping 60% of all cyber-attacks were actually caused by insiders. While 75% of these attacks were due to malicious intent (e.g. corporate espionage, disgruntled employees), 25% were entirely inadvertent. That means that 15% of all cyber-attacks can be traced back to negligence alone.

Other innovative Solutions to cybersecurity challenge

Hardware Authentication

With hardware authentication, a user's identity is coded into the hardware itself, giving devices their own unique fingerprints. This is especially important when it comes to IoT because a network needs to make sure the thing accessing it has permission to do so.

Other innovative Solutions to cybersecurity challenge

Deep Learning

Also known as neural networks, is a term used to cover many different technologies, including AI and machine learning.

Other innovative Solutions to cybersecurity challenge

Deep Learning

It focuses on observing working environments or “entities” to create a database of knowledge, which will help it identify cyber attack patterns and block suspicious activities.

Other innovative Solutions to cybersecurity challenge

The Cloud

Either public or private cloud, the cloud allows us to store information remotely without needing a lot of hardware and it frees clients of the need to hire specialists thereby saving money.

Other innovative Solution to cybersecurity challenge

The Cloud

...This technology is still fairly new and relies on virtualization technology to create firewalls, intrusion detection and prevention systems, and security hardware.

Other innovative Solution to cybersecurity challenge

The Cloud

... As this technology evolves, we will continue to see new ways to protect the data stored in the cloud.

Other innovative Solution to cybersecurity challenge

User Behavior Analytics

Although we may visit the same websites and use the same software, every user interacts with systems and devices in their own way and that's where user behavior analytics comes in...

Other innovative Solution to cybersecurity challenge

User Behavior Analytics

...By looking at a user's activity and comparing past and present actions, as well as using peer analysis to compare behavior within a company or department, this system can identify unusual behavior and stop threats immediately.

Other innovative Solution to cybersecurity challenge

Political engagement

While there is currently no global political will (@the UN) to address IG issues of which cybersecurity is one, however, something can be done at the regional (EU GDPR, AU CCPDP), concerned global stakeholders (GCSC)...

Other innovative Solution to cybersecurity challenge

Political engagement

...and at national level from policy articulation and enforcement to secured government / personal domain of business to mitigation strategies mentioned above.

Conclusion

As limitless as the universe is, so also are possibilities that can evolve with human effort at innovation. What is most important is to quickly identify new threat vectors and mitigate the gap...

Conclusion

...This is why organisation must invest in their human capital and engage experts with cyber security certifications to protect the life-line of any modern economy, data.

Thank you for listening.

Q/A

jolufuye@kontemporary.net
Twitter: @jolufuye