密级：外部公开

31C3会议的热门议题

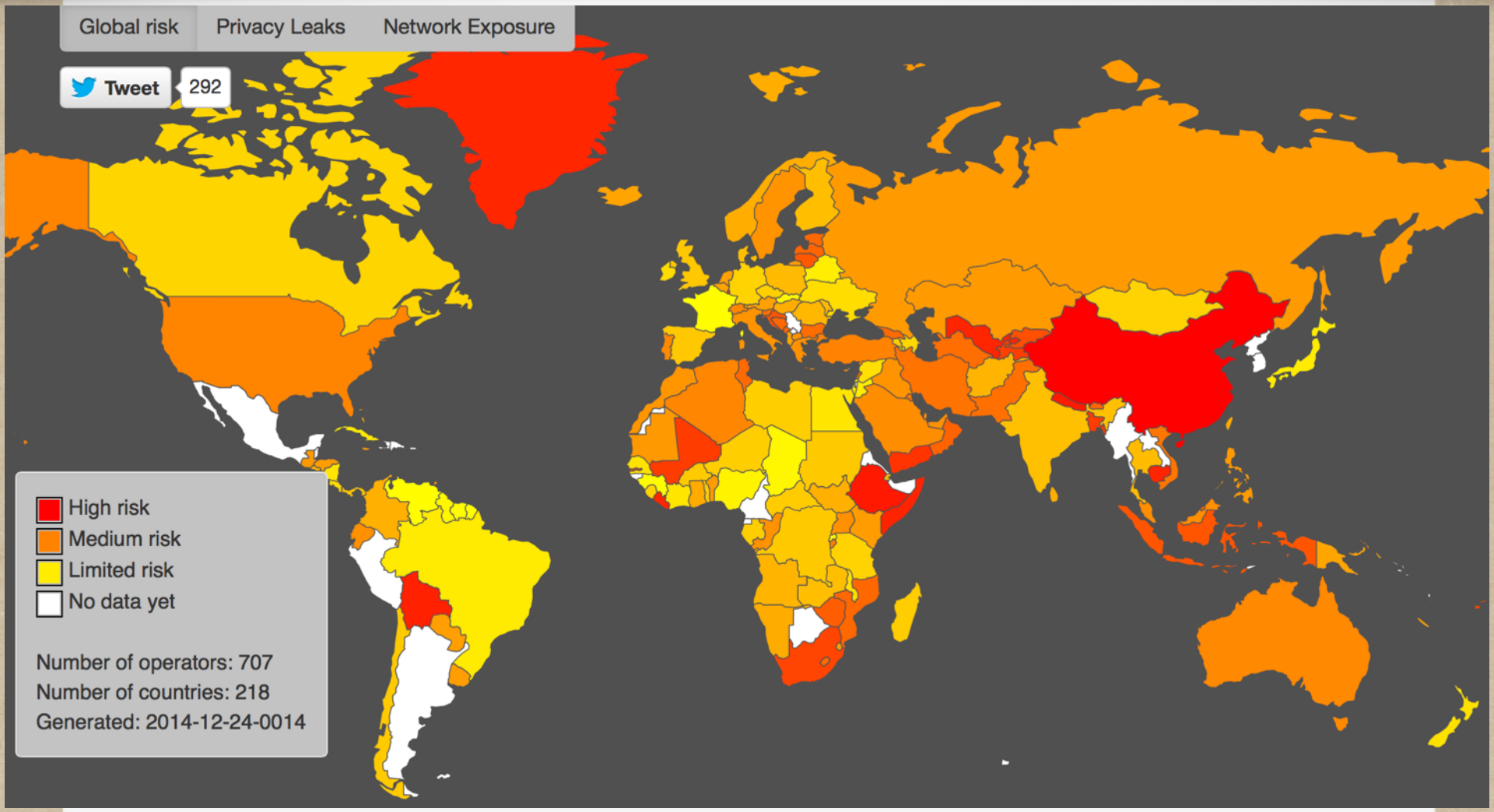
(ISC)² 北京分会

2015年1月15日

Agenda

1. SS7 七号信令安全问题
   - SS7: Locate. Track. Manipulate.
   - Mobile self-defense
   - SS7map : mapping vulnerability of the international mobile roaming infrastructure
2. EMV 银行卡PIN拦截和欺诈检测
   - Practical EMV PIN interception and fraud detection
3. NSA 的新爆料(声明:纯转发不代表分会观点)
   - Reconstructing narratives

1. SS7安全问题 - SS7map



1. SS7安全问题 - 风险点

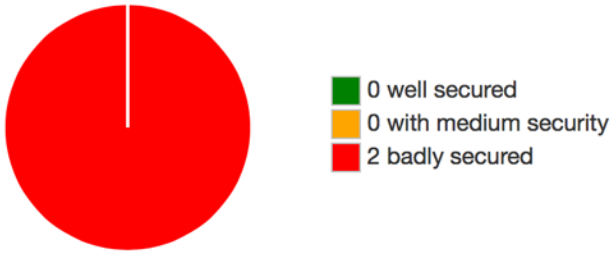
- Privacy Leaks
  - Operators are leaking out subscriber privacy data such as location of their subscribers or IMSI to anyone on the SS7 network.
- Network Exposure
  - Network Elements exposed and security mechanism implemented by operators. It shows the attack surface of the Telecom Network of a country from the SS7 perspective.

1. SS7安全问题 - 中国现状

Privacy Risk level	**164 / 218** 2986.8
SS7 messages disclosing subscriber city location	8
SS7 messages disclosing subscriber street location	4
SS7 messages disclosing private informations	8
Leak of subscriber keys	2
Leak of prepaid/postpaid status	2
Leak subscriber location through Home Routing bypass	?
Network Exposure level	**164 / 218** 2644.9
SCCP discovery attack surface	567
Network Elements fingerprint	567
Potential change of prepaid/postpaid status (fraud)	2
Home Routing*	0
Leak of internal topology through Home Routing bypass	?

SS7 Security of China

Operators tested



2 surveyed operator / 3 operators

2. EMV 银行卡PIN拦截和欺诈检测

由于时间关系，请自行观看最后一页链接的演讲视频:P

3. NSA的新爆料

Prying Eyes: Inside the NSA's War on Internet Security

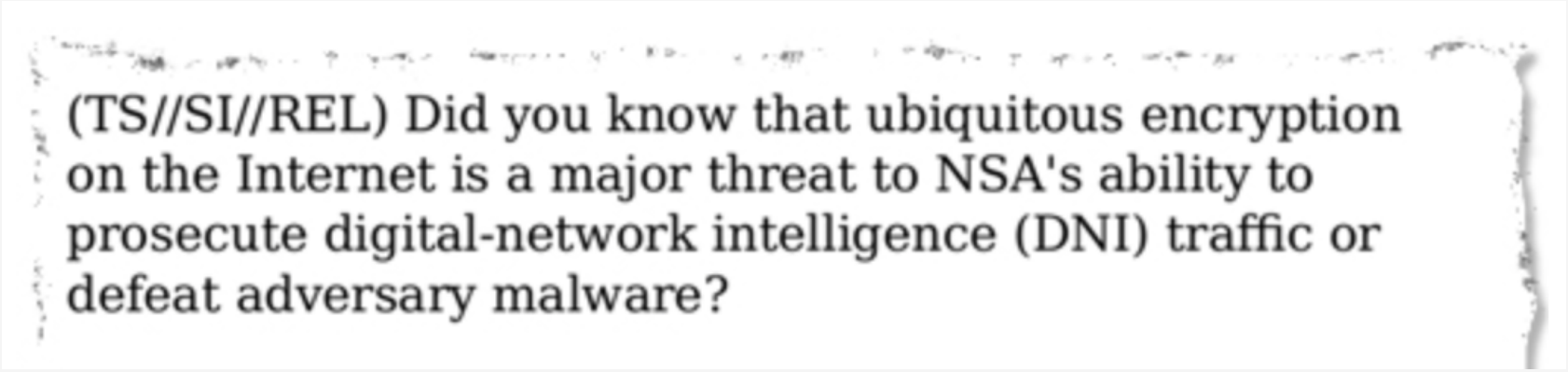
By SPIEGEL Staff

AP/dpa

US and British intelligence agencies undertake every effort imaginable to crack all types of encrypted Internet communication. The cloud, it seems, is full of holes. The good news: New Snowden documents show that some forms of encryption still cause problems for the NSA.

Different Threat?

- For the NSA, encrypted communication -- or what all other Internet users would call secure communication -- is "a threat".


(TS//SI//REL) Did you know that ubiquitous encryption on the Internet is a major threat to NSA's ability to prosecute digital-network intelligence (DNI) traffic or defeat adversary malware?

$$$$$

- In 2013, the NSA had a budget of more than $10 billion.
- According to the US intelligence budget for 2013, the money allocated for the NSA department called Cryptanalysis and Exploitation Services (CES) alone was $34.3 million.

Skype

- “Sustained Skype collection began in Feb 2011”

VPN

- NSA operates a large-scale VPN exploitation project to crack large numbers of connections, allowing it to intercept the data exchanged inside the VPN — including
  - the Greek government's use of VPNs
  - SecurityKiss, a VPN service in Ireland

VPN…cont.

- by the end of 2011, the NSA … simultaneously surveilling 20,000 supposedly secure VPN communications per hour.
- PPTP
  - a project called FOURSCORE that stores information including decrypted PPTP VPN metadata.
- IPSec
  - attack routers involved in the communication process to get to the keys to unlock the encryption rather than trying to break it

SSL/TLS

- NSA intended to crack 10 million intercepted https connections a day by late 2012
- collects information about encryption using the TLS and SSL protocols … in a database called "FLYING PIG."
  - weekly trends report to catalog services
  - Sites like Facebook, Twitter, Hotmail, Yahoo and Apple's iCloud service top the charts

SSH

- SSH
  - The NSA also has a program with which it claims it can sometimes decrypt the Secure Shell protocol (SSH)

Weakening Cryptographic Standards

- NSA agents travel to the meetings of the Internet Engineering Task Force (IETF)
  - ...to influence the discussions there

Weakening Cryptographic Standards…cont.

- using supercomputers
  - The NSA maintains a system called Longhaul, an "end-to-end attack orchestration and key recovery service for Data Network Cipher and Data Network Session Cipher traffic."

Weakening Cryptographic Standards…cont.

- to steal cryptographic keys from the configuration files found on Internet routers.
  - A repository called Discoroute contains "router configuration data from passive and active collection”

Weakening Cryptographic Standards…cont.

- gathering of vast amounts of data
  - For example, they collect so-called SSL handshakes

Weakening Cryptographic Standards…cont.

- If all else fails, the NSA and its allies resort to brute force
  - They hack their target's computers or Internet routers

Blind to NSA

- Truecrypt
  - Developers stopped their work…last May
- OTR (off-the-record)
  - "No decrypt available for this OTR message.”
- PGP
  - it remains too robust for the NSA spies to crack
  - Five Eyes intelligence services sometimes use PGP themselves

Blind to NSA…cont.

- Tor+CSpace+ZRTP
  - "near-total loss/lack of insight to target communications, presence”

1. Tor: Anonymization service
2. CSpace: Instant messaging system
3. ZRTP: Internet telephony (voice over IP)

A Grave Threat to Security

- For the NSA, the breaking of encryption methods represents a constant conflict of interest.
- NSA is also tasked with providing the US National Institute of Standards and Technology (NIST) with "technical guidelines in trusted technology"
- One NSA document shows that the agency is actively looking for ways to break the very standard it recommends. e.g. AES

The End


The Colbert Report
March 14, 2014 ·
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"Remember NSA employees: surveillance is designed to out treason, so it shouldn't bother you if you aren't hiding anything. Since nothing can be hidden from the NSA, nothing is bothering you." http://on.cc.com/1fucu7d
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surveillance is designed to out treason, so it shouldn't bother you if you aren't hiding anything. Since nothing can be hidden from the NSA, nothing is bothering you.
监督的目的是叛国罪，所以它不应该打扰你，如果你不隐瞒任何东西。因为没有什么可以隐藏的国家安全局，没有什么在困扰你。

Links

1. http://media.ccc.de/browse/congress/2014/31c3_-_6249_-_en_-_saal_1_-_201412271715_-_ss7_locate_track_manipulate_-_tobias_engel.html#video
2. http://media.ccc.de/browse/congress/2014/31c3_-_6122_-_en_-_saal_1_-_201412271830_-_mobile_self-defense_-_karsten_nohl.html#video
3. http://media.ccc.de/browse/congress/2014/31c3_-_6531_-_en_-_saal_6_-_201412272300_-_ss7map_mapping_vulnerability_of_the_international_mobile_roaming_infrastructure_-_laurent_ghigonis_-_alexandre_de_oliveira.html#video
4. http://media.ccc.de/browse/congress/2014/31c3_-_6120_-_en_-_saal_1_-_201412271600_-_practical_emv_pin_interception_and_fraud_detection_-_andrea_barisani.html#video
5. http://media.ccc.de/browse/congress/2014/31c3_-_6258_-_en_-_saal_1_-_201412282030_-_reconstructing_narratives_-_jacob_-_laura_poitras.html#video
6. http://www.spiegel.de/international/germany/inside-the-nsa-s-war-on-internet-security-a-1010361.html

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