black hat ASIA 2022

To loot or Not to Loot? That Is Not a Question When State-Nexus APT Targets Online Entertainment Industry

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TeamT5
Senior Analyst

Agenda

I. Introduction: What is Online Entertainment?

II. APTs in the Game

III. TTPs: What and How in Kill Chain

IV. Strategic Analysis

V. Mitigation and Key Takeaway

U.S. State Governments Targeted by Chinese Hackers via Zero-Day in Agriculture Tool

ovacs on March 08, 2022

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roup believed to be sponsored by the Chinese government has breached the of U.S. state governments, including through the exploitation of a zero-day lity.

TECHNOLOGY

Chinese State-Backed Hackers Targeted India's Government Agency And Times Group Using Winnti Malware

NEWS

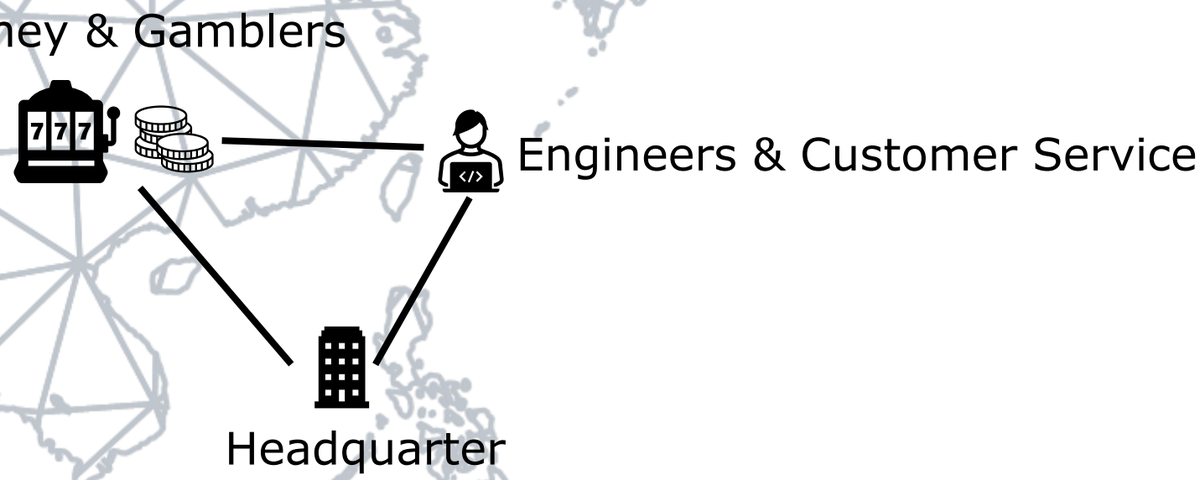
Chinese APT 27 hackers targeting companies, says Germany

Germany's domestic intelligence service says the Chinese hacking group APT 27 has launched cyberattacks on businesses. The group has long been suspected of attacking Western government agencies.

What is Online Entertainment?

Online Entertainment Industry Chain

- Industry Chain Worldwide (most illegal)
- Lucrative Nature
- Various way to “Entertain” (to game/gamble)
  Board Games, Sports, Video games, lotteries…



Players in the Game

Amoeba (aka APT41, Winnti)

GreedyTaotie (aka APT27, Emissary Panda)

Tools Overlap

Tools Overlap

Victim Overlap
(Operation DRBControl)

TianWu

SLIME29

SLIME34

Tools Overlap

menuPass
(aka APT10)

TTPs: Initial Access

Weaponization & Reconnaissance

Weaponization:

- Mostly applying off-the-shelf tools or modifying for operations
- Proprietary tools developed for maintaining access or LM

3 Hypotheses for Reconnaissance:

- Scenario1: Underground or secret sources
- Scenario2: Recruiting websites or forums

招SEO/组长/负责人/团队、有权重站资源、不扣成本 [redacted]
20000-60000 杜拜 柬埔寨 菲律宾 / 不限 / 学历不限
市区 晋升空间大 法定节假日 定期体检 绩效奖金 包吃 半小时前

❤️❤️官方HR直招seo~ 各种职能岗位～技术岗位 [redacted]
20000-500000rmb 杜拜 柬埔寨 菲律宾 / 不限 / 中专
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招聘推广（中国）、翻译（中英） [redacted]
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市区 有培训 晋升空间大 环境良好 绩效奖金 弹性工作 2 小时前

- Scenario 3: Distributors

Phishing Employees

- Spear phishing employees of targeted companies
- Using daily work related documents (web design photos, financial statements, pink slip) to lure users into opening

员工开除通知书

_____先生/女士

鉴于您在职期间，违反本公司以下规定：

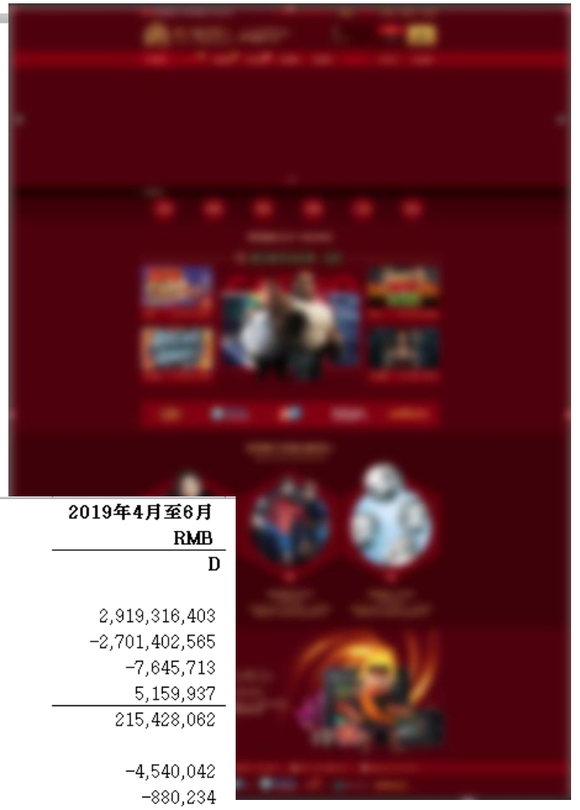
不断调戏公司女同事

12个小时工作时间有11.5个小时在装逼

严重违反了我单位的规章制度，损害了单位利益（根据实际原因注明），根据我国相关法规并结合本单位的《规章制度》决定予以除名。

本公司有权追究你的一切法律责任的权利（视您的表现）

特此通知



	2020年4月至6月 HKD A	2020年1月至3月 HKD B	与上季度比较 HKD C = (A-B) / B	2019年4月至6月 RMB D
收入				
存款+在线收款	7,112,331,673	4,960,373,382	2,151,958,291	2,919,316,403
付款	-6,671,886,045	-4,582,448,473	-2,089,437,572	-2,701,402,565
额度变化	-6,297,148	-8,417,698	2,120,550	-7,645,713
JD代理线分帐收入	5,091,663	4,655,672	435,992	5,159,937
	439,240,143	374,162,883	65,077,260	215,428,062
成本				
广告费	-11,075,092	-3,310,716	-7,764,376	-4,540,042
坏账损失	-16,182,836	-1,971,525	-14,211,310	-880,234
手续费(银行+商户)	-16,032,602	-8,778,442	-7,254,160	-15,979,995
平台租金	-46,497,076	-37,632,495	-8,864,580	-21,545,083
运维费	-2,759,564	-7,408,044	4,648,480	-2,052,366
AG888电投支出	0	67,436	-67,436	-103,952
	-92,547,169	-59,033,786	-33,513,383	-45,101,673
费用				
一般行政费	-22,416,214	-15,712,509	-6,703,705	-5,234,876
租金等其他费用	-638,268	-705,695	67,427	-662,978
薪酬等其他费用	-15,431,683	-11,556,992	-3,874,691	-10,533,103
亚游利息(辉哥)	-27,000,000	-27,000,000	0	-13,500,000
	-65,486,165	-54,975,196	-10,510,969	-29,930,956

Phishing Customer supports

- Spear phishing customer supports of the target
- Complaining about system issues and asking supports to open attachments to check

Phishing via SNP

- Crafting profiles on social network platforms, forums
- Approaching sales, ITs, RDs of targeted companies
- Delivering malware by cloud drives or custom web servers

Vulnerability

Exchange server (CVE-2021-34473)

- Using ProxyShell exploit to gain a foothold on an exchange server

VPN Server (CVE-2018-13379)

- The actor intruded by using a Fortigate exploit to gain VPN credentials

Browser (CVE-2021-38001)

- The actor used watering hold attacks and hosted exploit codes on seebug[.]updetasrvers.org

Web and NAS server vulnerabilities

Compromised ERP System

Supply Chain Attack

- first compromised ERP system of the victim via some web vulnerability
- used ERP to distribute several malware include, CrossWalk and FunnySwitch

Compromised Official Websites

Supply Chain Attack

- Compromised the official website of a cryptocurrency company
- Replaced some installation package with trojanized version

TTPs: Malware & Post Exp.

Malware

- Winnti
- FunnySwitch
- CrossWalk
- Spyder
- **Sqlcmsps**
- **IISAccept**

- Pangolin8RAT
- CobaltStrike Beacon

TianWu

- CobaltStrike beacon
- PlugX
- HelloKety

SLIME34

- HyberBro
- ChinaChopper

- **PlugX***
- **CoinDrop**
- **Hehedalinux**
- **RKORAT**

SLIME29

IIS Backdoor

IDA View-A | Pseudocode-A | Strings | Hex View-1 | Structures | Enums | Imports | Exports

IDA View-A | Pseudocode-B | Pseudocode-A | Strings | Hex View-1 | Structures | Enums | Imports | Exports

```
18  memset(OutputString, 0, 0x208ui64);
19  sub_180003E40(
```

```
39  memset(v27, 0, 0x104ui64);
40  wsprintfA(v27, "select top 1 ID, DailyMaxWin, DailyNetWin, Token, MaxBalance from Account where Username='%s'", a2);
41  if ( (unsigned int)exec_sql_command(CommandLine, (__int64)v22) == 1 )
42  {
43    if ( !(unsigned int)json_convert(v22, &v20) )
44    {
45      v7 = "json convert faild.";
46  LABEL_28:
47      v15 = lstrlenA(v7);
48      sub_1800020F0(a1, v7, (unsigned int)(v15 + 1));
49      goto LABEL_29;
50    }
51    v8 = sub_180009FC0(&v20, "Result");
52    if ( (unsigned __int8)sub_18000AFE0(v8)
53      || (v9 = sub_180009FC0(&v20, "Result"), (unsigned int)sub_18000AAA0(v9) != 1) )
54    {
55      v7 = "rpc sql exec faild.";
56      goto LABEL_28;
57    }
58    if ( (unsigned int)sub_180026160(&v20, 1i64, 1i64, "ID", lpString2) == 1 )
59    {
60      v10 = (const CHAR *)lpString2;
61      if ( v19 >= 0x10 )
62        v10 = lpString2[0];
63      lstrcpyA(a3, v10);
64    }
```

00023217 sub_180023D20:43 (180023E17)

F:\XProject\Project\Salon4\IISAccept\x64\Release\IISAccept.pdb

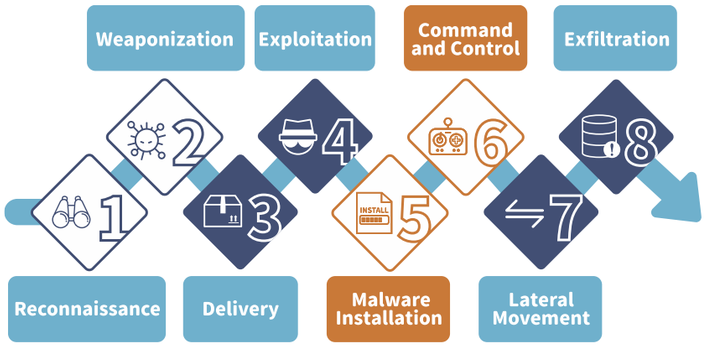
SQL Backdoor

```
264  GetLocalTime(&SystemTime);
265  v192[0] = 0x5655F3FF;
266  v192[1] = 0x48564157;
```

IDA View-A | Pseudocode-B | Pseudocode-A | Strings | Hex View-1 | Structures | Enums | Imports | Exports

```
194  v99 = -1;
195  v100 = -25;
196  ModuleHandleA = GetModuleHandleA("sqllang.dll");
197  if ( !ModuleHandleA )
198    return 0i64;
199  memset(v101, 0, sizeof(v101));
200  wsprintfA(v101, "WorkAddress: %I64d", ModuleHandleA + 504035);
201  v39 = sub_180005AB0;
202  v92 = (unsigned __int64)(ModuleHandleA + 504038);
203  v97 = (unsigned __int64)ModuleHandleA + 2016157;
204  if ( !VirtualProtect(ModuleHandleA + 504035, 0x400ui64, 0x40u, &flOldProtect) )
205    return 0i64;
206  lpBaseAddress = VirtualAlloc(0i64, 0x400ui64, 0x1000u, 0x40u);
207  if ( !lpBaseAddress )
208    return 0i64;
209  NumberOfBytesWritten = 0i64;
210  CurrentProcess = GetCurrentProcess();
211  if ( !WriteProcessMemory(CurrentProcess, lpBaseAddress, &Buffer, 0x76ui64, &NumberOfBytesWritten) )
212    return 0i64;
213  v7 = -17848;
214  v9 = -1;
215  v10 = -30;
216  v8 = lpBaseAddress;
217  v2 = GetCurrentProcess();
218  return WriteProcessMemory(v2, ModuleHandleA + 504035, &v7, 0xCui64, &NumberOfBytesWritten);
219 }
```

00000E27 sub_180001620:196 (180001A27)



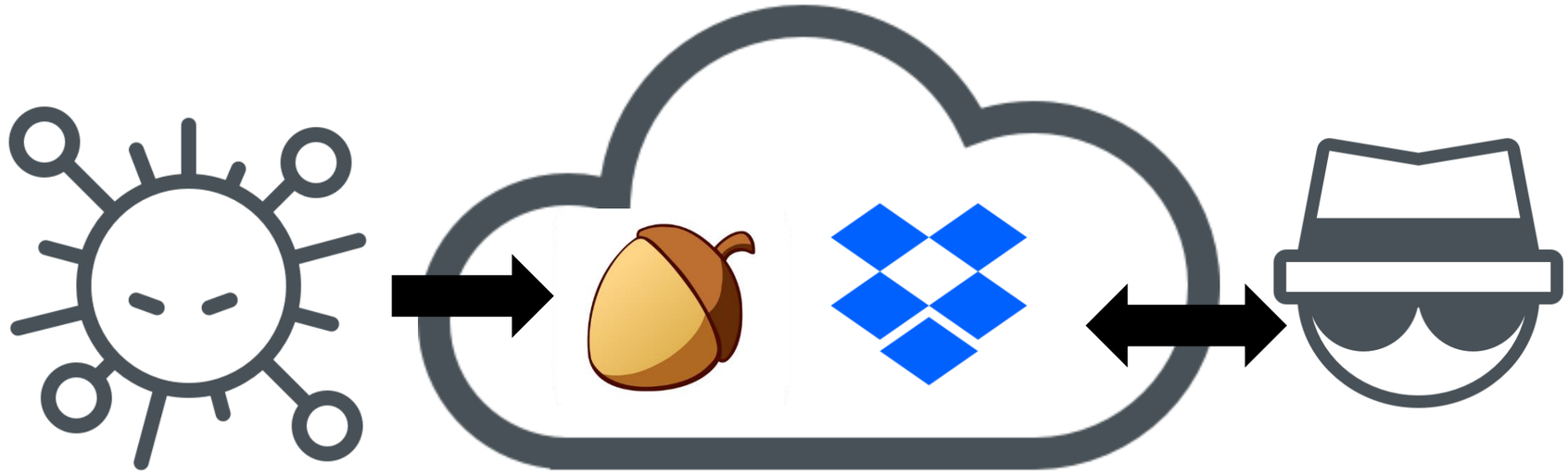
https://www.welivesecurity.com/2019/10/21/winnti-group-skip2-0-microsoft-sql-server-backdoor/

Lateral Movement

- Mostly Off-the-shelf tools: Nbtscan, PsExec, PwDumps, mimikatz
- RAT harvested credentials, dictionary attacks or exploits (e.g., EternalBlue) are used for privileges escalation
- Two stages of operations are usually adopted:
  - Stage1: automatic tools or scripts for environment reconnaissance
  - Stage2: manually penetrations interleaved with automatic tools for precise strikes

Exfiltration

- Actors created free accounts on cloud storage platform (堅果雲, DropBox…)
- Malware communicates with clouds for concealment



TTPs: Deploying Ransomware?

SLIME34's Ransomware

SLIME34

- LockFile, AtomSilo, Rook, NightSky
- Time: 2021 H2 ~ 2022 H1
- Target: the manufacturing, financial services, engineering, legal, business services, and travel and tourism sectors.
- TTP:

ProxyShell (CVE-2021-34473)

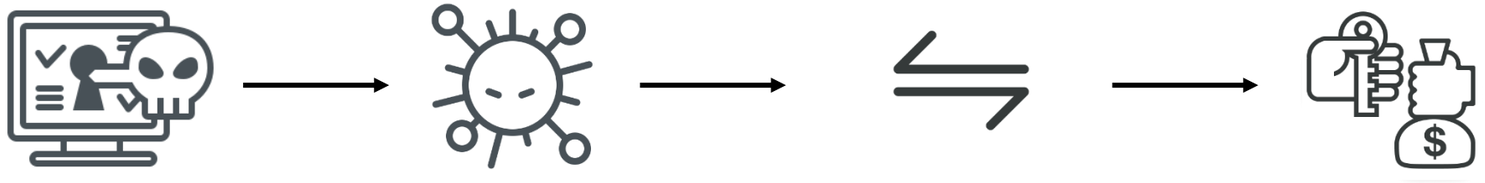
RAT installation
(CoblatStrike Beacon)

Lateral movement
(PetitPotam CVE-2021-36942)

Ransom!

ColdLock

- Time: 2020/05
- Target: Critical Infrastructure, High Tech
- TTP:



Web compromise

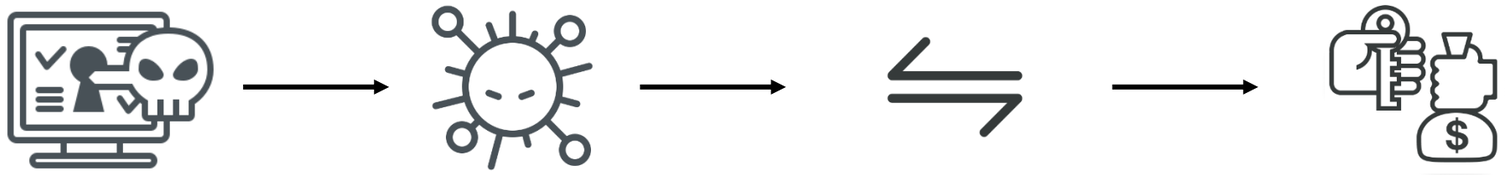
RAT installation
(CoblatStrike Beacon)

Lateral movement

Ransom!

Polar Ransomware

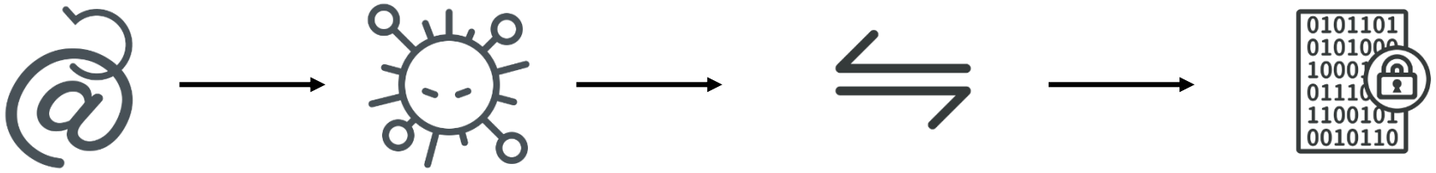
- Time: 2020/04
- Target: Media outlet
- TTP:



Web compromise → RAT installation (Sysupdate) → Lateral movement → Ransom!

Bitlocker

- Time: Early 2020
- Target: Online Entertainment
- TTP:



Spear phishing

RAT installation

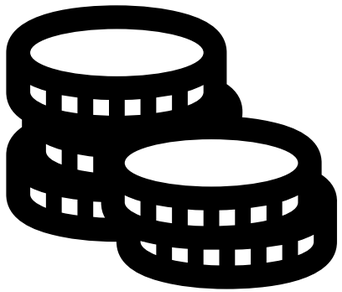
Lateral movement

Encrypt!

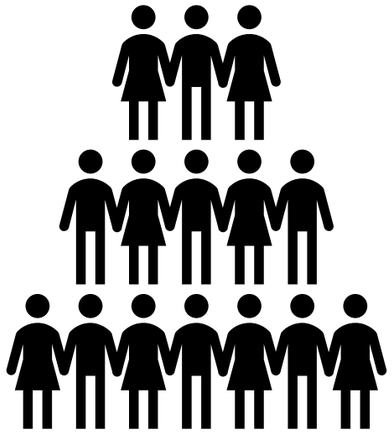
SLIME29

Political Motivation behind those APT?

Should pay much attention to it because…



Money Driven



Information Collection

Of Course !!

Based on our observation, only SLIME29 focused on financial-gain intrusion operations, the rest all have strong political related operations.

SLIME34

Cybercrime VS Cyber Espionage: “Indicator of Money”

“Indicator of Money”	Amoeba	GreedyTaoTie	Slime 34	Tian Wu	Slime 29
Deploy Ransomware	**Y**	**Y**	**Y**	N	**Y**
Deploy Crypto Miners	**Y**	**Y**	N	N	N
Hacker for Hire	**Y**	**Y**	N/A	N/A	N/A
Only Targeting Industry with Strong Cash Flow	N	N	N	N	**Y**

Why the Chinese Government Puts Significant Pressure to Online Entertainment Industry?

China's Crackdown

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BUSINESS

China to Tighten Rules Over Casinos in Macau

Bill would cut the tenure for new casino licenses in half and require operations to align with China's national security needs

South China Morning Post

China / Politics

China targets online casinos in war on illegal gambling, authorities say

- Operators are using internet platforms to connect gamblers, casinos and proxies, head of mainland prosecutor's office says
- Macau police had arrested Suncity casino junket boss Alvin Chau Cheok-wa over alleged illegal gambling platform and encouraging mainlanders to bet online

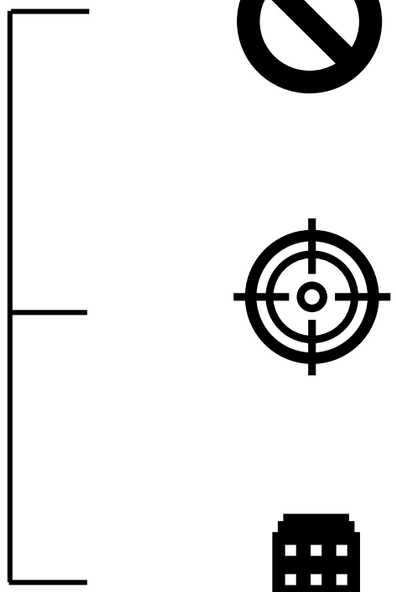
Geo-politics/threat landscape

China’s crackdown on gambling industry

- China’s crackdown on Macau gambling industry forced gamblers to move online
- Online gambling skyrocketed during the time of pandemic
- Abundant money and data (personal info and cash flow)

Reason I: Stability

Info collected



Stop Bribery
*Anti-corruption Campaign

Clean up related Infrastructures in China

Take down involved companies

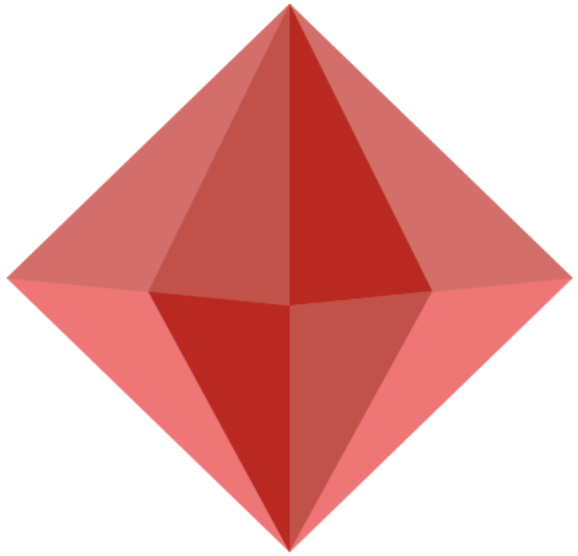
Reason II: The Money

So how do we Mitigate such Threats?

ADVERSARY

5 Chinese APT Groups:

- **Amoeba (APT41, Winnti)**
- **GreedyTaotie (APT27, Emissary Panda)**
- **TianWu**
- **SLIME34**
- **SLIME29**

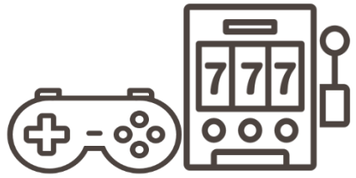


CAPABILITY

- Reconnaissance techniques: off-the-shelf tools
- Delivery methods: Phishing, Supply Chain Attack
- Attacking exploit / vulnerability in Exchange server, Web, NAS, etc
- Specially Designed RAT, Ransomware
- Lateral movement skills and tools: Mostly Off-the-shelf tools

INFRASTRUCTURE

- VPS, 堅果雲, Dropbox, etc



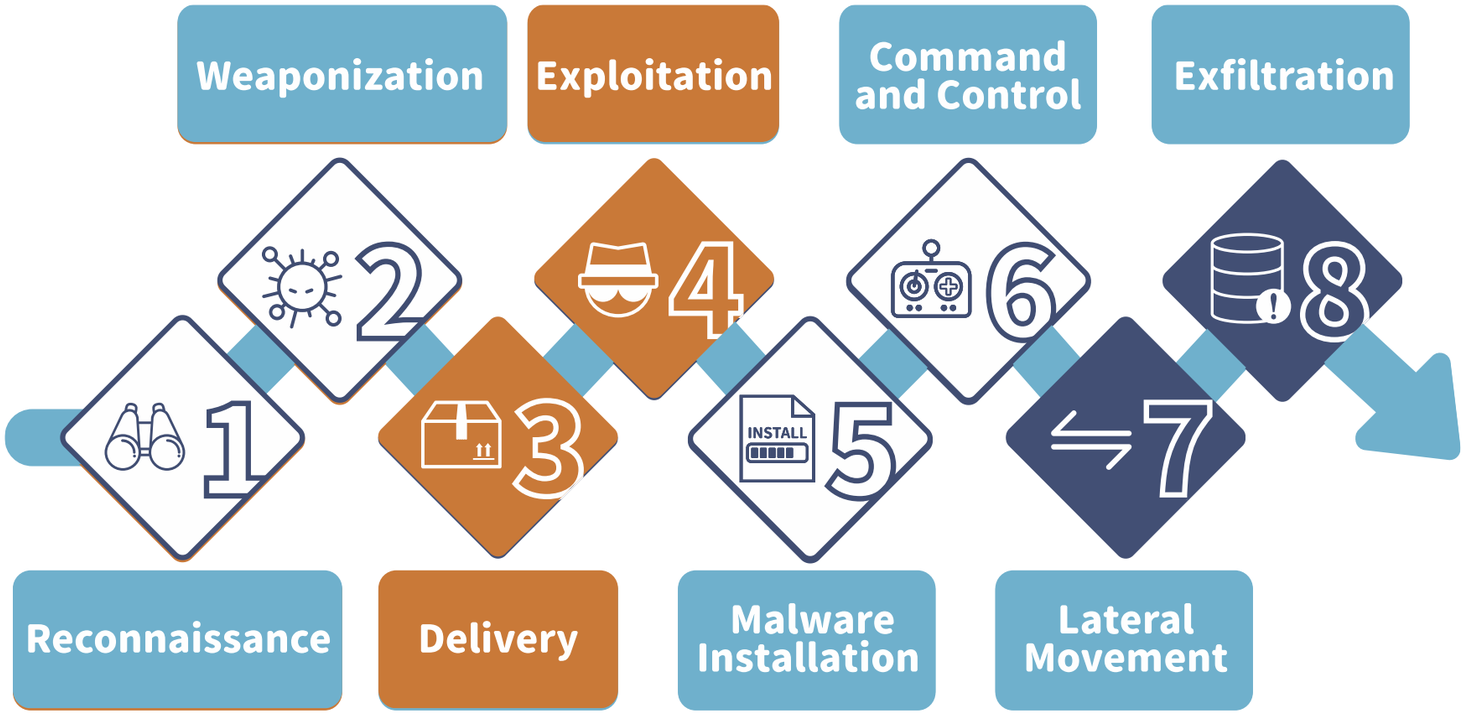
TARGET

- **Purpose: Money and Sensitive Data**
- **Target countries / regions: APAC**
- **Target sectors: Online Entertainment industry**

Countermeasures

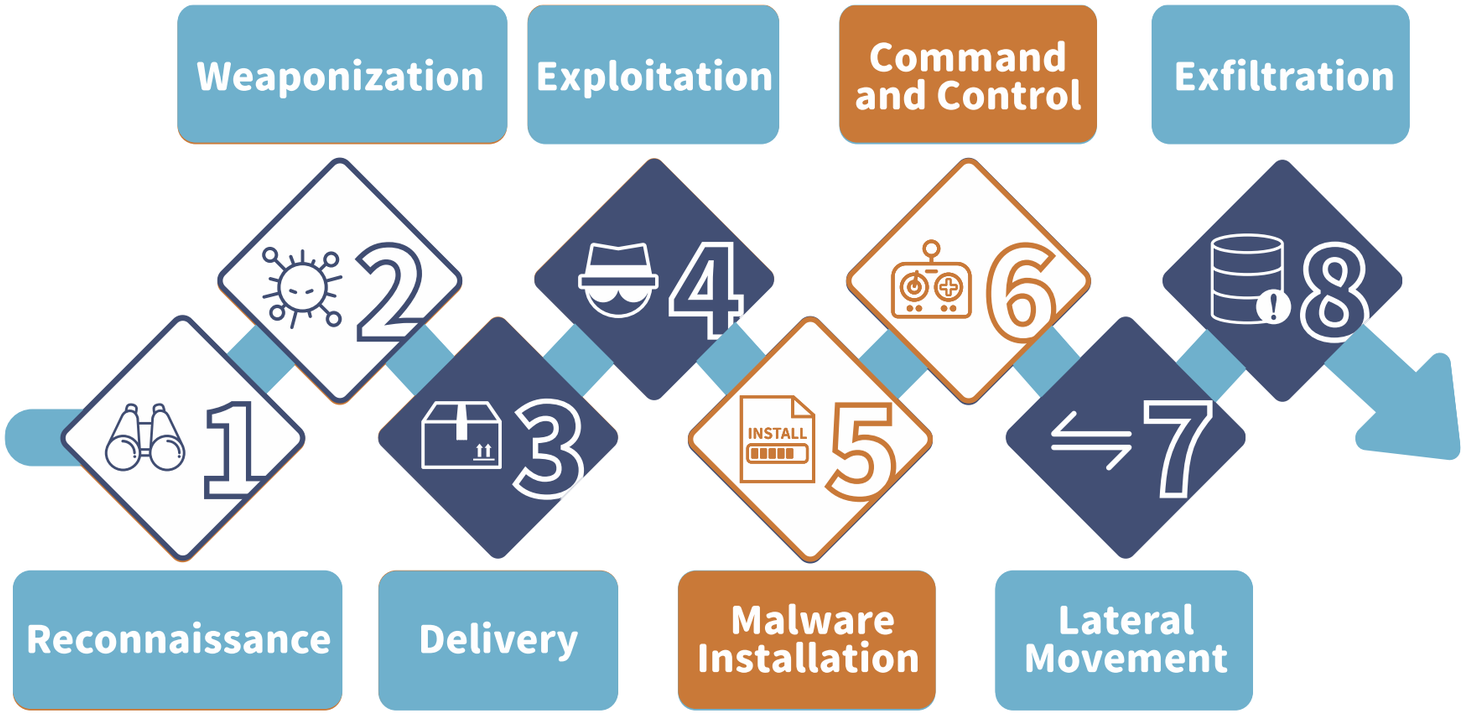
- **Isolation between Op. Dev. and OA environment.**
- **Catch-up with new hacking tools, techniques, etc.. discussed in security community**

Countermeasures



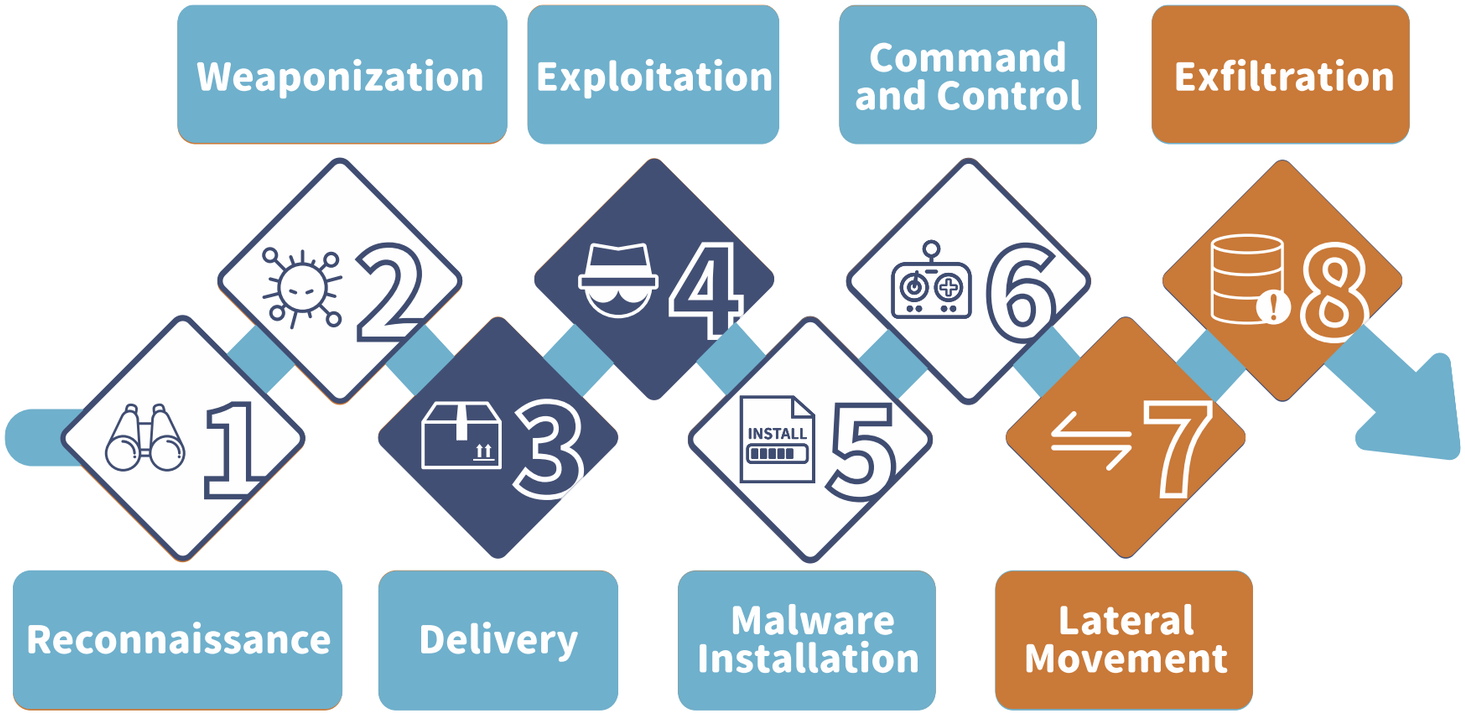
- **Patch! Patch & Patch, not only for machines but also humans.**
- **Regular drills will help.**

Countermeasures



- **RATs usually support various protocols, or leveraging cloud platforms**
- **Protocols or C2 information are seldom covered in firewalls, IPS, IDS and AV products**

Countermeasures



- **Patch for intra-net is a headache, but you must**
- **Backdoor accounts for management is hackers' good friends**
- **You need tailored and accurate threat intelligence**

Key Takeaway: Start the Threat Intelligence Cycle

1. China-nexus APT groups have launched massive attacks against the online entertainment business in APAC region.

2. Dissecting the current TTPs is merely the first step.

3. China-nexus APT are closely aligned with the national interests of the Chinese government.

Indicator of Compromise (IoC): Command and Control Server (C2)

35.187.194.33
47.106.112.106
23.106.123.236
support.office365excel.org
update.office365excel.org
update.huobibtc.net
ssl.360antivirus.org
support.symanteprotection.com
103.255.179.54
www.omgod.org
yt-sslvpn.itcom888.live
158.247.220.169
vappvcsa.itcom888.live
156.240.104.149
45.77.174.106

103.79.78.48
52.163.225.199
40.122.105.12
VSVRS3DC02.bren-lnc.com
13.76.136.18
104.209.198.177
47.75.49.32
167.179.92.82
mail.bren-inc.info
bren-inc.email
89.35.178.105
103.79.78.48
107.148.131.210
35.187.148.253
ns162.nsakadns.com
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45.77.250.141

cs.full-subscription.com
full-subscription.com
line.full-subscription.com
yd.full-subscription.com
zk.full-subscription.com
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api.gpk-demo.com
api.geming8888.com
45.153.242.41
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23.106.122.225
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23.106.125.132
23.106.124.156
45.76.188.46
23.106.122.182
23.106.122.205
23.106.123.16
23.106.122.58
23.106.122.5
backup.microsupdate.com
line.full-subscription.com
time.daytimegamers.com
yd.full-subscription.com
login.good-enough-8fe4.com
www.orientbate.com
23.19.58.13
cdn2.twmicrosoft.com
139.180.156.45

SLIME34

27.102.106.132
27.102.106.183
27.102.114.246
27.102.115.249
27.102.127.182
27.50.162.19
42.51.22.68
54.180.89.244
api.kaspresksy.com
api.microsofts.info
microsofts.info
onedrive.miscrosofts.com
smsapi.tencentchat.net
update.kaspresksy.com
normostat.com
www.normostat.com
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nenasporte.com
update.microsoftlab.top
www.microsofts.info
caibi379.com
weixin.dptoutiao.cn
162.33.178.57
172.105.162.84

SLIME29

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www.kkxx888666.com
172.16.2.1
update.googletvi.com
112.175.238.60
103.24.205.128
mod.goodyouxi.com
xinmod.goodyouxi.com
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mail.bren-inc.info
bren-inc.email
112.121.165.138
117.18.14.20
ogag.daji8.me
plus.daji8.me
shopingchina.net
www.shopingchina.net
linux.shopingchina.net
tools.daji8.me
linux.daji8.me
www.daji8.me
182.16.71.234
103.253.40.126
182.255.63.53
wmgnews.daji8.me
daji8.me
av.daji8.me

Thank You!

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