ECHO

CYBER THREAT INTELLIGENCE

LAZARUS (APT-38) Analysis REPORT

Content

Executive Summery

This report aims to provide a detailed analysis of the Lazarus APT group, evaluating their activities, targets, and the attack techniques they have employed. The Lazarus APT group is a long-standing and internationally active threat actor known for engaging in various sectors with complex attack campaigns for financial gain, espionage, and cyber sabotage.

The report delves into the technical capabilities and attack strategies of the Lazarus APT group by examining prominent past attack campaigns and their targets. The sectors they have targeted include finance, energy, media, technology, and the public sector. Furthermore, the report explores how the group utilizes techniques such as social engineering, malware injection, and advanced persistent threats to reach their objectives.

In addition to their advanced attack capabilities, the report highlights the group's skills in target identification and concealing long-term espionage activities. The Lazarus APT group continuously evolves their cyber attacks, persistently challenging security experts and defense mechanisms.

In conclusion, this report underscores the significance of the Lazarus APT group in the realm of cyber threats, emphasizing the need for organizations to bolster their defense strategies and develop more effective protection methods against advanced attacks. Understanding the group's activities and implementing countermeasures are critical necessities for the cybersecurity community.

Introduction

As cybersecurity threats become increasingly sophisticated and complex, hackers and cyber adversaries are employing evolving techniques to carry out attacks on an unprecedented scale. In this context, long-standing and versatile threat actors like the Lazarus APT group have captured the attention of cybersecurity experts and defense mechanisms. The Lazarus APT group has conducted intricate attacks targeting a wide range of sectors on an international level, with goals encompassing financial gain, espionage, and cyber sabotage.

This report aims to provide an in-depth examination of the activities of the Lazarus APT group, offering a comprehensive overview of their attack techniques, targets, and operations. By evaluating prominent past attack campaigns and their respective targets, the report seeks to enhance our understanding of the group's methods and strategies.

The activities of the Lazarus APT group hold significance for cybersecurity experts and industry leaders. Their targeted sectors span finance, energy, media, technology, and the public sector. The objective of this report is to assist cybersecurity professionals and decision-makers in adopting more effective defense measures against potential threats posed by the Lazarus APT group by studying their attack capabilities, strategies, and operations.

Subsequently, the report will delve into the group's notable attack campaigns, types of malware employed, attack vectors, and tactics used to target specific entities. Furthermore, the report will assess the group's advanced capabilities in the realm of cybersecurity and their international scope of operations.

Countries and Sectors Targeted by the Lazarus APT Group

The Lazarus APT group has established a broad range of targets on an international scale through its long-standing activities. The group has carried out complex attacks with the intent of financial gain, espionage, and cyber sabotage, targeting specific countries and sectors.

1. Financial Sector:

The Lazarus APT group has carried out attacks targeting numerous organizations within the financial sector. Banks, financial institutions, and cryptocurrency exchanges have been significant targets for the group. In pursuit of financial gains, the group has launched attacks against its targets through malicious software, causing substantial losses.

2. Energy and Defense Sector:

The energy and defense sectors have been focal points of Lazarus APT group's cyber espionage activities. The group has employed advanced attack techniques to access sensitive information related to energy companies and the defense industry. The targets within these sectors can pose a significant threat to national security, given the group's use of sophisticated attack methods to gain access to critical information.

3. The Technology and Telecommunications Sector:

The Lazarus APT group has carried out attacks targeting companies operating in the technology and telecommunications sectors. The targets within these sectors can be subjected to attacks aiming to steal trade secrets, gain access to innovative technologies, and acquire strategic information.

4. Public and Political Organizations:

Lazarus APT group has also conducted attacks against the public sector and political organizations. Such targets may involve espionage activities for political reasons or aiming to impact national security. The group has launched large-scale cyber attacks by targeting government agencies and international organizations.

5. Media and Entertainment Sector:

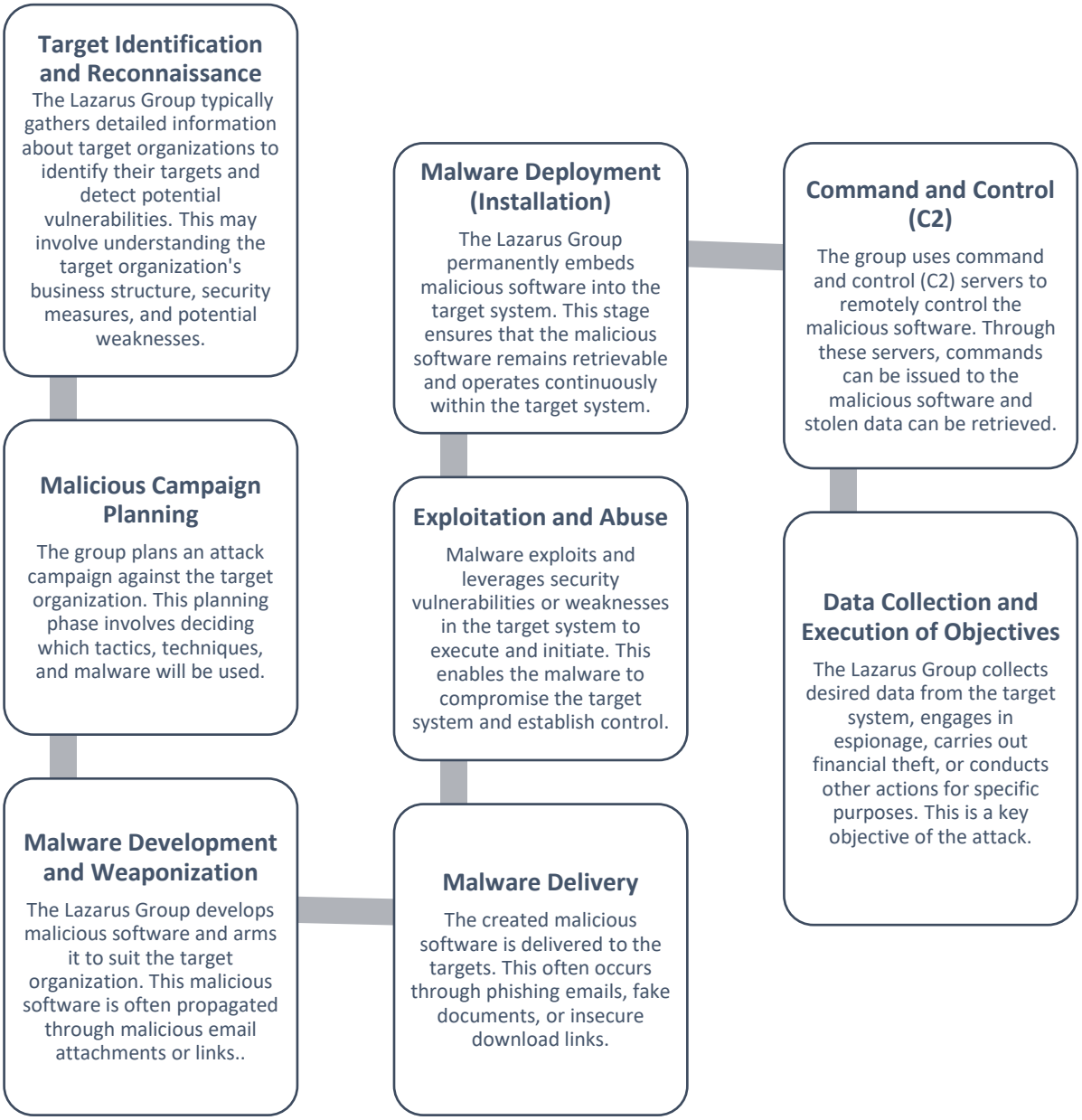
Medya ve eğlence sektörü de Lazarus APT grubunun hedeflerinden biridir. Bu sektördeki hedefler, ünlü kişilerin verilerinin çalınması, sansürü aşma veya propaganda amaçlarına yönelik olabilir.

The diversity of countries and sectors targeted by the Lazarus APT group demonstrates the breadth of their operations and strategies. The ability to target numerous sectors and countries of this kind positions the group as a significant threat to international cybersecurity.

Information is available regarding the countries among which the Lazarus APT group has targeted. The following countries are included:

- Taiwan
- China
- Germany
- India
- Russia
- Brazil
- Singapore
- Indonesia
- Vietnam
- South Korea
- Japan
- United States
- United Kingdom
- Australia
- Turkey
- Saudi Arabia

Attack Chain



Attack and Campaigns

Attacks

Crypto payment service provider CoinsPaid fell victim to a cyberattack resulting in the theft of $37.2 million worth of cryptocurrency.

Lazarus targets vulnerable Microsoft IIS servers to distribute malicious software.

The Lazarus APT group exploited a zero-day vulnerability in attacks targeting a South Korean financial entity.

The FBI confirmed that the Lazarus APT group was behind the $100 million cyber heist on Harmony Horizon Bridge.

Lazarus was associated with a cyber attack targeting the IT infrastructure and email server of NPO Mashinostroyeniya, a Russian space rocket designer and intercontinental ballistic missile engineering organization.

Blockchain analysts attribute the recent attack on the payment processing platform Alphapo, resulting in the theft of around 60 million dollars' worth of cryptocurrency, to the North Korean Lazarus group.

Campaigns

Operation Dream Job (C0022)

Operation Dream Job is a comprehensive and sophisticated cyber espionage campaign initiated by the Lazarus APT group in 2019. The Lazarus APT group is recognized for its long-standing activities and is a globally-reaching cyber threat actor group.

Campaign Initiation and Objectives:

The Operation Dream Job campaign is a complex espionage endeavor initiated by the Lazarus APT group for financial purposes. The campaign targets organizations in the financial sector with the aim of achieving financial gain. Among the targets are banks, financial institutions, cryptocurrency exchanges, and other finance-related sectors. The primary objectives of the campaign include:

- Gaining access to the content of financial institutions and stealing account information.
- Infiltrating cryptocurrency exchanges to seize digital assets.
- Injecting malicious software into banking systems to manipulate financial transactions.
- Campaign's Technical Structure and Methods:

The Operation Dream Job campaign employs advanced cyber attack techniques. These techniques include social engineering, phishing attacks, malware injection, and sophisticated persistent threats. The campaign attacks its targets using the following methods:

Spear Phishing: Delivering malware to targeted organizations through customized phishing emails.

Malicious Attachments: Encouraging victims to open malicious attachments by using enticing subjects like fake job applications.

Backdoor Creation: Developing backdoors to enable the infiltration of malicious software into target systems.

Command and Control (C2) Servers: Establishing C2 servers to communicate with compromised systems and issue commands."

AppleJeus (S0584)

AppleJeus is a downloader family that was initially discovered in 2018 embedded in trojanized cryptocurrency applications. It is attributed to the Lazarus Group. AppleJeus has been used to target companies in the energy, finance, government, industrial, technology, and telecommunications sectors, as well as several countries including the United States, United Kingdom, South Korea, Australia, Brazil, New Zealand, and Russia. AppleJeus has been utilized to distribute the FALLCHILL RAT.

DTrack BackDoor (S0567)

Dtrack is a spyware that was discovered in 2019 and was used against Indian financial institutions, research facilities, and the Kudankulam Nuclear Power Plant. It shares similarities with the DarkSeoul campaign attributed to the Lazarus Group.

Dtrack allows attackers to collect information from the infected host computer, upload/download/manipulate files to/from the infected host, exfiltrate data, and execute commands.

WannaCry (S0366)

WannaCry is a type of ransomware that triggered a major global cybersecurity attack in 2017, impacting millions of computers worldwide.

Emergence and Spread of WannaCry Ransomware

WannaCry ransomware emerged suddenly in May 2017 and quickly triggered a global crisis. This attack is an example of the ransomware type, where malicious actors lock computer systems and demand ransom from victims. WannaCry exploited a security vulnerability (MS17-010) in Windows operating systems to spread, affecting numerous computers.

After encrypting computer files, the attack made it impossible to recover data without paying the ransom. WannaCry coerced users with the threat that files would be permanently lost if the ransom was not paid, inducing panic and distress.

Global Impacts and Significance

The WannaCry ransomware attack impacted numerous organizations, hospitals, government agencies, and individual users on a global scale. This event highlighted the critical nature of cybersecurity. It also emphasized that cyberattacks can pose threats not only to financial well-being but also to people's health and safety. The WannaCry attack served as an example of how cybersecurity risks can affect not only companies but also public services and citizens.

Most Commonly Used Malware Families by Lazarus Group

EarlyRAT

An offshoot of the Lazarus APT group, a subgroup known as Andariel, has been discovered using an undisclosed remote access Trojan (RAT) named 'EarlyRAT'.

EarlyRAT was uncovered around mid-2022, during which threat actors leveraged Log4Shell to breach corporate networks.

EarlyRAT bears resemblance to another tool used by Lazarus, MagicRAT, which involves creating scheduled tasks and downloading additional malicious payloads from the command and control (C2) server.

MagicRat

MagicRat is a malicious software family used to infiltrate target systems and facilitate data theft. It is commonly spread through social engineering tactics and malicious emails, distracting users and enabling unauthorized access to systems. MagicRat is employed to conduct covert espionage activities and steal sensitive information.

TigerRAT

TigerRAT is a sophisticated cyber espionage tool that primarily targets Asian-based objectives. This toolkit infiltrates target systems through phishing emails or malicious links, aiming to steal data, conduct espionage, or establish remote control. TigerRAT is employed to gather advanced threat intelligence and monitor the activities of targets.

TrickBot

TrickBot is known as a Trojan specifically designed for targeting the financial sector. It aims to steal users' bank account information, credit card data, and other financial details. Additionally, it may also include ransomware features and demand ransom through data encryption. TrickBot is a threat commonly used by Lazarus for financial gain.

Lazarus Group's Exploited Vulnerabilities

- **Log4j**
- **CVE-2018-4878**
- **CVE-2021-31166**
- **CVE-2021-31176**
- **CVE-2021-31178**
- **CVE-2021-31207**
- **CVE-2008-5007**
- **CVE-2006-3616**
- **CVE-2007-1486**
- **CVE-2014-4610**
- **CVE-2014-4609**
- **CVE-2014-4608**
- **CVE-2014-4611**
- **CVE-2014-4607**
- **CVE-2014-4610**
- **CVE-2014-4608**

YARA RULE

```
import "hash"

rule Rule_MagicRAT

{

meta:

        author="Bilal BAKARTEPE & Bugra KOSE"

        description="MagicRAT Analysis"

strings:

        $opc1="53 48 83 EC 20 B8 01 00 00 00 48 89 CB 48 85 C9 48 0F 44 D8 48 89 d9
E8 7C 73 3A FF 48 85 C0 74 0F 48 83 C4 20 5B C3"


condition:

        hash.md5(0,filesize) == "aea6585be1b8ed83061e13b72e2f21d7" or $opc1


}
```

SIGMA RULES

SIGMA RULE 1

```
title: MagicRAT Malware Family
status: experimental
description: Detects MagicRAT Network Behaviours.
author: Bilal BAKARTEPE & Buğra KÖSE
date: 2023/08/10
tags:
    - attack.persistence
    - attack.T1082
    - attack.T1071.001
    - attack.T1059.003
logsource:
    category: network_connection
    product: windows
detection:
    selection:
        cs-method: 'GET'
        resource.URL:
        - 64.188.27.73.static.quadranet.com
        - 172.16.3.81
        - p409198-omed01.tokyo.ocn.ne.jp
        - gendoraduragonkgp126.com/
    condition: selection
fields:
    - RAT
    - Lazarus
level: critical
```

SIGMA RULE 2

```
title: MagicRAT Malware Family
status: experimental
description: Detects MagicRAT Process Behaviours.
author: Bilal BAKARTEPE & Buğra KÖSE
date: 2023/08/10
tags:
    - attack.persistence
    - attack.T1082
    - attack.T1071.001
    - attack.T1059.003
logsource:
    category: process_creation
    product: windows
detection:
    selection1:
        TargetImage: cmd.exe
    selection2:
        CommandLine:
        - cmd.exe  /c bcdedit
    selection3:
        TargetImage: schtasks.exe
    selection4:
        CommandLine:
        - '/create /tn \"OneDrive AutoRemove\" /tr \"C:\Windows\System32\cmd.exe /c del /f /q C:/Users/user/Desktop/'
        - '/sc daily /st 10:30:30 /ru SYSTEM'
    selection5:
        CommandLine:
        - 'schtasks /create /tn \"OneDrive AutoRemove\" /tr \"C:\Windows\System32\cmd.exe /c del /f /q
C:/Users/user/Desktop/'
        - '/sc daily /st 10:30:30 /ru SYSTEM'
    selectionHash:
        event_id: 1
        event_data.Hashes:
        - 586F30907C3849C363145BFDCDABE3E2E4688CBD5688FF968E984B201B474730
        - 8ce219552e235dcaf1c694be122d6339ed4ff8df70bf358cd165e6eb487ccfc5
        - c2904dc8bbb569536c742fca0c51a766e836d0da8fac1c1abd99744e9b50164f
        - dda53eee2c5cb0abdbf5242f5e82f4de83898b6a9dd8aa935c2be29bafc9a469
        - 90fb0cd574155fd8667d20f97ac464eca67bdb6a8ee64184159362d45d79b6a4
        - 226086b5959eb96bd30dec0ffcbf0f09186cd11721507f416f1c39901addafb
        - 16F413862EFDA3ABA631D8A7AE2BFFF6D84ACD9F454A7ADAA518C7A8A6F375A5
        - 05732E84DE58A3CC142535431B3AA04EFBE034CC96E837F93C360A6387D8FAAD
        - 6FBB771CD168B5D076525805D010AE0CD73B39AB1F4E6693148FE18B8F73090B
        - 912018AB3C6B16B39EE84F17745FF0C80A33CEE241013EC35D0281E40C0658D9
        - CAF6739D50366E18C855E2206A86F64DA90EC1CDF3E309AEB18AC22C6E28DC65
        - 2963a90eb9e499258a67d8231a3124021b42e6c70dacd3aab36746e51e3ce37e
        - 2AA1BBBE47F04627A8EA4E8718AD21F0D50ADF6A32BA4E6133EE46CE2CD13780
        - 5A73FDD0C4D0DEEA80FA13121503B477597761D82CF2CFB0E9D8DF469357E3F8
        - C92C158D7C37FEA795114FA6491FE5F145AD2F8C08776B18AE79DB811E8E36A3
    condition: (selection1 and selection2) or (selection1 and selection5) or (selection3 and selection4) or (selectionHash)
fields:
    - RAT
    - Lazarus
level: critical
```

IoC's

Hashs

586F30907C3849C363145BFDCDABE3E2E4688CBD5688FF968E984B201B474730	VSingle
8ce219552e235dcaf1c694be122d6339ed4ff8df70bf358cd165e6eb487ccfc5	MagicRAT
c2904dc8bbb569536c742fca0c51a766e836d0da8fac1c1abd99744e9b50164f	MagicRAT
dda53eee2c5cb0abdbf5242f5e82f4de83898b6a9dd8aa935c2be29bafc9a469	MagicRAT
90fb0cd574155fd8667d20f97ac464eca67bdb6a8ee64184159362d45d79b6a4	MagicRAT
226086b5959eb96bd30dec0ffcbf0f09186cd11721507f416f1c39901addafb	YamaBotf
16F413862EFDA3ABA631D8A7AE2BFFF6D84ACD9F454A7ADAA518C7A8A6F375A5	Procdump
05732E84DE58A3CC142535431B3AA04EFBE034CC96E837F93C360A6387D8FAAD	Procdump
6FBB771CD168B5D076525805D010AE0CD73B39AB1F4E6693148FE18B8F73090B	Mimikatz
912018AB3C6B16B39EE84F17745FF0C80A33CEE241013EC35D0281E40C0658D9	Mimikatz
CAF6739D50366E18C855E2206A86F64DA90EC1CDF3E309AEB18AC22C6E28DC65	Mimikatz
2963a90eb9e499258a67d8231a3124021b42e6c70dacd3aab36746e51e3ce37e	3Proxy
2AA1BBBE47F04627A8EA4E8718AD21F0D50ADF6A32BA4E6133EE46CE2CD13780	PuTTY
5A73FDD0C4D0DEEA80FA13121503B477597761D82CF2CFB0E9D8DF469357E3F8	PuTTY
C92C158D7C37FEA795114FA6491FE5F145AD2F8C08776B18AE79DB811E8E36A3	Adfind

IPs

1[.]251[.]44[.]118	51[.]68[.]119[.]230
101[.]0[.]115[.]80	51[.]79[.]44[.]111
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211[.]202[.]2[.]195	155[.]94[.]210[.]11
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217[.]69[.]41[.]33	54[.]68[.]42[.]4
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URLs

hxxp[://]104[.]155[.]149[.]103/2-443[.]ps1
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hxxp[://]www[.]ajoa[.]org/home/rar[.]tmp
hxxp[://]www[.]ajoa[.]org/home/tmp[.]ps1
hxxp[://]www[.]ajoa[.]org/home/ztt[.]tmp
hxxp[://]www[.]orvi00[.]com/ez/admin/shop/powerline[.]tmp
hxxp[://]64[.]188[.]27[.]73[.]static[.]quadranet[.]com
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https[:]//codevexillium[.]org/image/download/download.asp
https[:]//investbooking[.]de/upload/upload.asp

https[:]//transplugin[.]io/upload/upload.asp
https[:][//www.dronerc](https://www.dronerc/)[.]it/forum/uploads/index.php
https[:][//www.dronerc](https://www.dronerc/)[.]it/shop_testbr/Core/upload.php
https[:][//www.dronerc](https://www.dronerc/)[.]it/shop_testbr/upload/upload.php
https[:][//www.edujikim](https://www.edujikim/)[.]com/intro/blue/insert.asp
https[:][//www.fabioluciani](https://www.fabioluciani/)[.]com/es/include/include.asp
http[:]//trophylab[.]com/notice/images/renewal/upload.asp
http[:][//www.colasprint](https://www.colasprint/)[.]com/_vti_log/upload.asp

Domains

markettrendingcenter[.]com
lm-career[.]com
advantims[.]com
angeldonationblog[.]com
codevexillium[.]org
investbooking[.]de
krakenfolio[.]com
opsonew3org[.]sg
transferwiser[.]io
transplugin[.]io

VSingle C2s

hxxps[://]tecnojournals[.]com/review
hxxps[://]semiconductboard[.]com/xml
hxxp[://]cyancow[.]com/find

MagicRAT C2s

hxxp[://]155[.]94[.]210[.]11/news/page[.]php
hxxp[://]192[.]186[.]183[.]133/bbs/board[.]php
hxxp[://]213[.]32[.]46[.]0/board[.]php
hxxp[://]54[.]68[.]42[.]4/mainboard[.]php
hxxp[://]84[.]38[.]133[.]145/apollom/jeus[.]php
hxxp[://]mudeungsan[.]or[.]kr/gbbs/bbs/template/g_botton[.]php
hxxp[://]www[.]easyview[.]kr/board/Kheader[.]php
hxxp[://]www[.]easyview[.]kr/board/mb_admin[.]php

YamaBot C2s

hxxp[://]213[.]180[.]180[.]154/editor/session/aaa000/support[.]php

Other C2s

http://www.ikrea.or[.]kr/main/main_board.asp
http://www.fored.or[.]kr/home/board/view.php
https://www.zndance[.]com/shop/post.asp
http://www.cowp.or[.]kr/html/board/main.asp
http://www.style1.co[.]kr/main/view.asp
http://www.erpmas.co[.]kr/Member/franchise_modify.asp
https://www.wowpress.co[.]kr/customer/refuse_05.asp
https://www.quecue[.]kr/okproj/ex_join.asp
http://www.pcdesk.co[.]kr/Freeboard/mn_board.asp
http://www.gongsinet[.]kr/comm/comm_gongsi.asp
http://www.goojoo[.]net/board/banner01.asp
http://www.pgak[.]net/service/engine/release.asp
https://www.gncaf.or[.]kr/cafe/cafe_board.asp
https://www.hsbutton.co[.]kr/bbs/bbs_write.asp
https://www.hstudymall.co[.]kr/easypay/web/bottom.asp

SHA-1

3D311117D09F4A6AD300E471C2FB2B3C63344B1D	SHA-1
3ABFEC6FC3445759730789D4322B0BE73DC695C7	SHA-1
5CE3CDFB61F3097E5974F5A07CF0BD2186585776	SHA-1
FAC3FB1C20F2A56887BDBA892E470700C76C81BA	SHA-1
AA374FA424CC31D2E5EC8ECE2BA745C28CB4E1E8	SHA-1
E50AD1A7A30A385A9D0A2C0A483D85D906EF4A9C	SHA-1
DC72D464289102CAAF47EC318B6110ED6AF7E5E4	SHA-1
9F7B4004018229FAD8489B17F60AADB3281D6177	SHA-1
2A2839F69EC1BA74853B11F8A8505F7086F1C07A	SHA-1
8EDB488B5F280490102241B56F1A8A71EBEEF8E3	SHA-1

MD5 Hashes

02f75c2b47b1733f1889d6bbc026157c
06cd99f0f9f152655469156059a8ea25
07e13b985c79ef10802e75aadfac6408
09350e100a4bda4a276fca6a968eb9ea
09745305cbad67b17346f0f6dba1e700

09924946b47ef078f7e9af4f4fcb59dc
09a77c0cb8137df82efc0de5c7fee46e
0abdaebbdbd5e6507e6db15f628d6fd7
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16a278d0ec24458c8e47672529835117
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Mutex Name

Global\RRfreshRA_Mutex_Object

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CYBER THREAT INTELLIGENCE