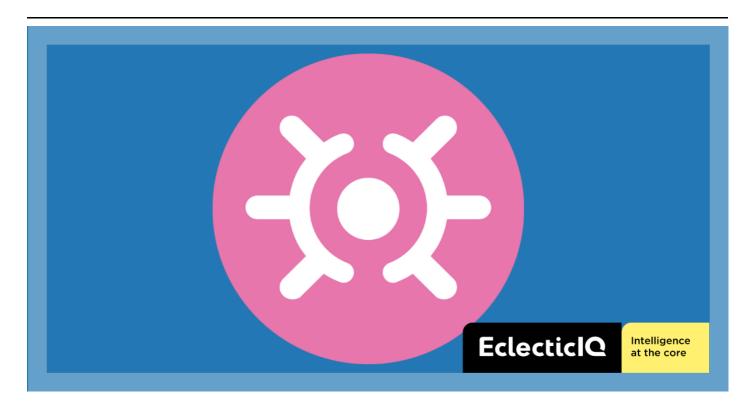
Dark Pink APT Group Strikes Government Entities in South Asian Countries



Executive Summary

In February 2023, EclecticIQ researchers identified multiple KamiKakaBot malwares which are very likely used to target government entities in ASEAN (Association of Southeast Asian Nations) countries.

The latest attacks, which took place in February 2023, were almost identical to previous attacks reported by Group-IB on January 11, 2023 (1). In January 2023, the threat actors used ISO images to deliver KamiKakaBot, which was executed using a DLL side-loading technique. The main difference in the February campaign is that the malware's obfuscation routine has improved to better evade anti-malware measures. Multiple overlaps in this new campaign aided EclecticIQ analysts in attributing it very likely to the Dark Pink APT group.

Dark Pink is an Advanced Persistent Threat (APT) group active in the ASEAN region. Group-IB originally named this group "Dark Pink," and it has also been referred to as "Saaiwc" by Chinese cybersecurity researchers (1,2). According to Group-IB, Dark Pink is thought to have started operations as early as mid-2021 with increasing activity in 2022.

KamiKakaBot's primary function is to steal data stored in web browsers such as Chrome, Edge, and Firefox. This includes saved credentials, browsing history, and cookies. Additionally, the threat actors can gain initial access on infected devices to execute remote code.

Developers of KamiKakaBot employ various evasion techniques to remain undetected while executing malicious actions on infected devices. For example, they use Living-off-the-Land binaries (LOLBINs), such as MsBuild.exe, to run the KamiKakaBot malware on victims' devices (7).

Attribution

There are multiple overlaps between adversary techniques and tactics used in this campaign and the previous campaign. For this reason, EclecticIQ analysts assess that the February 2023 campaign is very likely attributed to Dark Pink, though they acknowledge there is a chance this activity could be the word of a group with similar TTPs.

- According to EclecticIQ researchers, the KamiKakaBot and loader is a generic malware type and it's currently only used by Dark Pink APT group.
- The same command and control infrastructure was used in the February activity as was used previously in January 2023 activity (1).
- Malware delivery and execution techniques like DLL side loading with Winword.exe are identical to previous cyber-attacks done by Dark Pink group (1).

Key Judgments

Advanced Persistent Threat (APT) groups are almost certainly a significant cyber threat to ASEAN countries. APT groups like Dark Pink often target military and government organizations to steal sensitive information, including confidential data and intellectual property.

The increasing digitization of economies and relationships between Europe and the ASEAN region have very likely increased the risk of cyberattacks and the need for effective cyber defense measures (8).

In this new campaign, the relationship between Europe and ASEAN countries is very likely being exploited in the form of social engineering lures against military and government entities in Southeast Asian nations.

EclecticlQ researchers observed overlaps in malware delivery and adversary techniques between Earth Yako and Dark Pink threat groups, such as usage of Winword.exe for DLL Hijacking (2,3). Although researchers lack the conclusive proof needed to attribute the nationality of this group, the objectives of the attackers and some of the patterns suggest that the Dark Pink group could possibly be a Chinese APT group.

Malware Execution Flow

KamiKakaBot is delivered via phishing emails that contain a malicious ISO file as an attachment. The malicious ISO file contains a WinWord.exe which is legitimately signed by Microsoft, which is exploited for DLL side-loading technique. When a user clicks on WinWord.exe, the KamiKakaBot loader (MSVCR100.dll), located in the same folder as the WinWord file, automatically loads and is executed into the memory of WinWord.exe.

The ISO file also contains a decoy Word document that has an XOR-encrypted section. The KamiKakaBot loader uses this section to decrypt the XOR-encrypted content from the decoy file then

writes the decrypted XML KamiKakaBot payload into the disk (C:\Windows\temp) and executes it via a living-off-the-land binary called MsBuild.exe (7).

Before the execution of the decrypted XML payload, KamiKakaBot loader writes a registry key into HKCU\Software\Microsoft\Windows NT\CurrentVersion\Winlogon\Shell to abuse features of Winlogon (Windows component) for establishing persistent access (5).

KamiKakaBot can extract sensitive information from Chrome, MS Edge, and Firefox web browsers. The stolen browser data is then sent to attackers' Telegram bot channel in a compressed ZIP format. Upon initial infection, the attacker can upgrade the malware or perform remote code execution on the targeted device, enabling them to carry out further post-exploitation activities. All of the command and control communication takes place via a Telegram bot controlled by the threat actor.

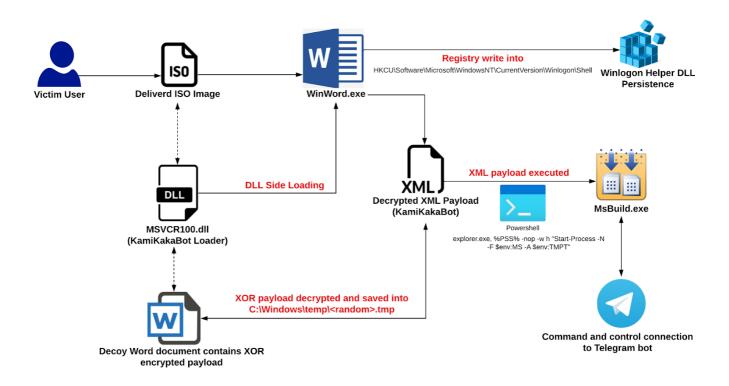


Figure 1 - Execution flow of KamiKakaBot.

Analysis of the ISO Image

Threat actors used different lures in each decoy Word document to trick their victims into opening the malicious attachment as shown in figure 2. The executable file named "Concept Note Strategic Dialog Version 30.1" is originally a Microsoft signed legitimate WinWord.exe.



Decoy Word





MSVCR100.dll



~Concept Note Strategic Dialog Version 30.1.doc

Concept Note Strategic Dialog Version 30.1.docx.exe

Digitally Signed Winword.exe (name is changed) document contains XOR encrypted **KamiKakaBot**

Figure 2 - Content of the ISO image.

The metadata in the delivered ISO image contains the file creation date and time (2023-02-01), which is helpful for researchers to determine the time of the campaign. This file was uploaded to VirusTotal on 2023-02-01 from Indonesia (5).

"Concept paper Strategic Dialog	ue DEU-IDN.zip.iso"
ExifTool Version Number	: 12.56
File Name	: Concept paper Strategic Dialogue DEU-IDN.zip.iso
File Size	: 2.6 MB
File Type	: ISO
File Type Extension	: iso
MIME Type	: application/x-iso9660-image
System	: Win32
Volume Name	: 02_01_2023
Volume Block Count	: 1255
Volume Block Size	: 2048
Root Directory Create Date	: 2023:02:01 08:09:02+07:00
Software	: AnyBurn
Volume Create Date	: 2023:02:01 08:09:02.00+07:00
Volume Modify Date	: 2023:02:01 08:09:02.00+07:00
Volume Size	: 2.6 MB

Figure 3 - Metadata of ISO file.

EclecticIQ researchers identified multiple ISO images that contained different decoy documents using phishing lures related to military or diplomacy in the ASEAN countries. Analysts assess the content of the decoy documents is designed to target government entities in ASEAN countries. Figure 4 illustrate the attempt by threat actors to leverage ASEAN-Europe relationships in their phishing lures (more examples of their attempts).

End of document

Concept Note

PROTECTED VIEW Be careful-files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View.

Indonesian- German Strategic Dialogue

At their meeting in Bali in July 2022, Foreign Ministers Retno Marsudi and Annalena Baerbock agreed to establish a new Strategic Dialogue. This concept note sets out the terms of reference for the Strategic Dialogue, jointly agreed by KEMLU and the Federal Foreign Office.

Background

Germany and Indonesia have agreed a Comprehensive Partnership as set out in the Jakarta Declaration of July 2012 and look back on successful diplomatic relations of more than 70 years. Our relationship is rooted in the friendships between our peoples and our historical ties, and is based on a shared commitment to upholding the rules-based international order, multilateralism, democracy, and human rights. Both countries wish to continue enhancing and expanding their cooperation, also building on synergies between Germany's Policy Guidelines for the Indo-Pacific, and the ASEAN Outlook on the Indo-Pacific.

Faced with increasing geopolitical tensions, both in the Indo-Pacific and in Europe, and the global climate crisis, we share the responsibility, as members of the G20, to promote effective global governance in a multipolar world, to play an active role to jointly tackle global challenges such as climate, food and energy security, and to promote sustainable development, respect for international law, including human rights and women's rights, and the peaceful settlement of disputes.

Objective

The Strategic Dialogue will provide a regular platform to discuss at Foreign Ministers' level global and regional issues of mutual interest, and to explore and agree joint initiatives in bilateral and multilateral fora. With an agenda focussed on a limited number of key topics mutually agreed in advance, the Strategic Dialogue will be an opportunity to hold an in-depth exchange, to enhance understanding of respective perspectives and interests, to align positions and to coordinate action.

Format

Enable Editing

We aim at convening the Strategic Dialogue once a year, in a 1+4 format that will allow confidential, free and open conversations. The Strategic Dialogue will not replace the annual Bilateral Steering Committee (BSC). The Strategic Dialogue will give guidance to the BSC, and task the BSC with specific follow-up.

The first Strategic Dialogue will be held during the first half of 2023 in Berlin.

Tentative agenda items (to be agreed ahead of each meeting):

- Policy approaches towards Russia/Ukraine, Afghanistan, Iran, China
- Indonesian ASEAN presidency, including Myanmar
- German and EU approach for the Indo-Pacific and expectations of Indonesia towards Germany and EU,
- Global food security, Energy and Climate security, possible multilateral initiatives, including on women and children in armed conflicts.

Figure 4 – Decoy Document File Name: "Concept paper Strategic Dialogue DEU-IDN" (The lure plays off the relationship between Europe and ASEAN countries).

The KamiKakaBot loader is designed to load the KamiKakaBot malware as stealthily as possible by performing the DLL side loading technique and incorporating other anti-malware evasion tactics, such as payload encryption and the use of living-off-the-land binaries.

DLL Side Loading by Winword.exe

In this latest KamiKakaBot campaign, threat actors used DLL side loading technique to bypass antimalware detection by loading the malware into the memory of Winword.exe (legitimate Microsoft Office binary used for opening Word documents).

Image: Second pert Note Strategic Dialog Version 30.1.docx.exe Image: Second pert Strategic Dialog Version 30.1.docx.exe Imag
Concept Note Strategic Dialog Version 30.1.docx.exe CloseFile Concept paper Strategic Dialogue DEU-IDN.zip/MSVCR100.dll SUCCES

Figure 8 - KamiKakaBot loader loaded into the memory of WinWord.exe (MSVCR100.dll).

DLL side loading is not a new technique, as the search-order hijacking vulnerability in Windows has existed since Windows XP. Due to the default search order built into Windows, threat actors can abuse the legitimate and signed binaries to load the malicious DLL.

Decryption of KamiKakaBot XML Ppayload Inside Decoy Word Document

During the initial infection, the KamiKakaBot loader is executed in the memory of the WinWord.exe binary and then it reads data from an XOR-encrypted section inside a decoy Word document. Figure 9 shows the XOR encrypted section inside decoy Word document.

~Con	cep	t No	te S	stra	tegi	ic Di	ialog	g Ve	ersie	on 3	0.1	.doc	×						
	Ő	1	2	3	4	5	6	7	8	9	Α	В	С	D	E	F	0123456789ABCDEF		
85A0h	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00			
85B0h	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00			
85C0h	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00			
85D0h	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00			
85E0h	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00			
85F0h	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00			
8600h	F6	9A	B8	A5	A0	AF	A9	BE	EA	9E	A5	A5	A6	B9	9C	AF	öš,¥ ©¾êž¥¥¦¹œ		
8610h	B8	B9	A3	A5	A4	F7	E8	FE	E4	FA	E8	EA	B2				,¹£¥¤÷èþäúèê²§¦¤	XOR encrypted	
8620h	B9	F7	E8	A2	BE	BE	BA	F0	E5	E5	B9	A9	A2	AF	A7	AB	¹÷袾¾°ðå幩¢ [—] §«		
8630h	B9	E4	A7	A3	A9	B8		B9		AC					A7	E5	¹ä§£©,¥¹¥¬¾ä©¥§å	section	
8640h	AE	AF	BC	AF	A6	A5	BA	AF	B8	E5	A7			BF	A3	A6	®~¼~¦¥°_,å§!"¿£¦		
8650h	AE			FA	FA	F9	E8	F4	C0	EA		C0			F6		®åøúúùèôÀêêÀêêöž		
8660h	AB			AF		EA									B9		«,- <u></u> %ê"«§ ⁻ ÷è ¹³¹ ¢		
8670h	A5	B9				C0			EA	EA		F6	B9	BC	A9	A2	¥1¾èôÅÅêêêêö1‰©¢		
8680h	A5	B9				~~		EA		F6			AB	B8	AD	AF	¥¹¾åôÅÅêêöåž«,-		
8690h	BE	F4				EA			-	B9		A4				B9	¾ôÀÀÀêêöŸ¹£¤-ž«¹		
86A0h	A1	C0		EA		EA		AB		A1		AB				E8	¡Àêêêêêž«¹;"«§¯÷è		
86B0h	B9	BC	A9	A2	A5	B9	BE	E8	C0	EA				9E		B9	1140¢¥1¾èAêêêêž«1		
86C0h	A1	80			BE	A5			F7			A5					¡Œ«©¾¥,³÷艥®¯ž«		
86D0h	B9	A1	8C	AB				B8		E8		EA			EA		¹¡Œ«©¾¥,³èÀêêêê∢		
86E0h	B9	B9		A7	A8	A6	B3	80		A6	AF	F7				87	11 ⁻ §"¦3Œ£¦ ⁻ ÷èîâ‡		
86F0h	99	88	BF	A3	A6	AE		A5		A6	B9				A2		™^¿£¦®ž¥¥¦¹š«¾¢ã		
8700h	96	87	A3	A9	B8		B9	A5	AC	BE					A6		-‡£©,¥¹¥¬¾ä^¿£¦®		
8710h	E4	9E	AB	B9	A1	B9	E4	BC	FE	E4	FA	E4	AE	A6	A6	E8	äž«¹¡¹ä¼þäú䮦¦è		
8720h																			

Figure 9 - XOR encrypted section inside decoy word document.

XOR decryption routine of KamiKakaBot Loader in disassembler:

Use Windows API ReadFile() to read the .doc file that contains a (~) tilde symbol inside the ISO image.

```
LAB_180005d90:

if (((((byte)local_6c8._0_4_& 7) != 7) ||

    (pwVar6 = wcsstr((wchar_t *)(local_6c8 + 0x2c),L".doc"), pwVar6 == (wchar_t *)0x0)) ||

    (pwVar6 = wcsstr((wchar_t *)(local_6c8 + 0x2c),L"~"), pwVar6 == (wchar_t *)0x0))

    goto LAB_180005ddd;

    pwVar6 = wcsstr((wchar_t *)(local_6c8 + 0x2c),L"%");
```

Figure 10 - The decoy Word document inside ISO image is highlighted in yellow.

Decrypt the XOR encrypted data by using a static key "0xCA" and writing it into disk.



Figure 11 - XOR decryption.

Gaining Persistent Access on Victim Device by Abusing Winlogon Helper DLL

After initial infection, the loader used a widely used persistence technique by abusing Winlogon Helper.

Winlogon.exe is a Windows component responsible for actions at logon/logoff. Registry entries in HKCU\Software\Microsoft\Windows NT\CurrentVersion\Winlogon are used to manage additional helper programs and functionalities that support Winlogon.

Malicious modifications to registry keys may cause Winlogon to load and execute malicious DLLs and/or executables on every time when user opens the device.

Figure 12 shows KamiKakaBot loader using Windows environment variables to perform command line obfuscation to execute the KamiKakaBot on every time when infected device is started.

Auto	runs Entry		Description	Publisher	Image Path			
Lo	ogon							
°н	KCU\SOFTWARE\Microsoft\Windows	s NT\CurrentVersion\Winlogo	n\Shell					
\checkmark	%PSS% -nop -w h "Start-Proces	s -N -F \$env:MS -A \$env:TMP	Т"		File not found: .exe			
ŕ	Registry Editor					_		×
File	Edit View Favorites Help							
Com	puter\HKEY_CURRENT_USER\SOFTV	VARE\Microsoft\Windows NT	\CurrentVersion\Winlogon					
^	Name	Туре	Data					
	(Default)	REG_SZ	(value not set)					
	🕮 BuildNumber	REG_DWORD	0x00004a64 (19044)					
	100 DP	REG_BINARY	d2 00 e8 00 2c 00 00 00 0d 0	0 00 00 23 e8 6b 57 00 00 00 00 00 00 00 00	14 95 7c c5 89 3f d9 01 14 95 7c c5 89 3	3f d9 01 00 00 (00	
	ab ExcludeProfileDirs	REG_SZ	AppData\Local;AppData\Lo	ocalLow;\$Recycle.Bin;OneDrive;Work Fold	ers			
	🕮 FirstLogon	REG_DWORD	0x0000000 (0)					
	ab ParseAutoexec	REG_SZ	1					
	10 PUUActive	REG BINARY	23 e8 6b 57 01 00 00 00 0d 0	0 56 00 a1 a6 01 00 a6 a6 01 00 a6 a6 01 00	<u>d2 00 00 00 0</u> 6 00 10 00 41 2d 3e 64 0e	17 37 00 0e 17	37	
	ab Shell	REG_SZ	explorer.exe, %PSS% -nop -	-w h "Start-Process -N -F \$env:MS -A \$en	v:TMPT"			

Figure 12 - Shell registry key modified by loader.

Below are a few of the new environment variables which KamiKakaBot writes into infected system (this data can be changed on each different campaign):

Name of the environment variable	Command line argument
%PSS%	powershell
\$env:MS	C:\Windows\Microsoft.NET\Framework64\ <version- number>\MSBuild.exe</version-
\$env:TMPT	C:\Windows\TEMP\wct <random-number-and-words>.tmp</random-number-and-words>

Figure 13 shows that environment variables are stored as encrypted inside the data section of the loader and the XOR decryption key ("0xa7") is used as statically to perform decryption during execution time.

sting: MSVCR100.dl - (18 addresses selected)	0 🗈 🕺 🐺 🖌 🕹 🕲 🖓	- x	Pecor	mple: FUN_1800047e0 - (MSVCR100.dll)
powershell[8]	FUN_1800047e0:180004fd5 (R	^	343	<pre>mw_registry_write((longlong **)&local_7f8,L*PSS*,(longlong *)0x3);</pre>
powershell[10]	FUN_1800047e0:180004f5b(R		344	<pre>RegOpenKeyExW((HKEY)0xffffffff80000001,L*Environment*,0,0x20006,&local_800);</pre>
powershell[12]	FUN_1800047e0:180004f60(R		345	<pre>pbVar21 = powershell;</pre>
powershell [14]	FUN_1800047e0:180004f65 (R		346	pbVar11 = powershell; XOR KEY
powershell[16]	FUN_1800047e0:180004f6a (R		347	uVar12 = uVar13;
powershell	FUN_1800047e0:180004f6f(R		348	} 0D
	FUN_1800047e0: 180004fd9 (R		349	*(ushort *)((longlong)pbVar11 + -2) = *(ushort *)((longlong)pbVar11 + -2) ^ 0xa7;
	FUN_1800047e0: 180004fde (R		350	<pre>*(ushort *)pbVar11 = *(ushort *)pbVar11 ^ 0xa7;</pre>
	FUN_1800047e0:180004fe3(R		351	*(ushort *)((longlong)pbVar11 + 2) = *(ushort *)((longlong)pbVar11 + 2) ^ 0xa7;
	FUN_1800047e0:180004fe8(R		352	*(ushort *)((longlong)pbVar11 + 4) = *(ushort *)((longlong)pbVar11 + 4) ^ 0xa7;
	FUN_1800047e0:180004fed(R	1	353	*(ushort *)((longlong)pbVar11 + 6) = *(ushort *)((longlong)pbVar11 + 6) ^ 0xa7;
	FUN_180005ca0:180005e62(R		354	*(ushort *)((longlong)pbVar11 + 8) = *(ushort *)((longlong)pbVar11 + 8) ^ 0xa7;
	FUN_180005ca0:180005e6e(W		355	*(ushort *)((longlong)pbVar11 + 10) = *(ushort *)((longlong)pbVar11 + 10) ^ 0xa7;
	FUN_180005ca0:180005e91(*		356	*(ushort *)((longlong)pbVar11 + 0xc) = *(ushort *)((longlong)pbVar11 + 0xc) ^ 0xa
	FUN_180005ca0: 180005f0e (R		357	*(ushort *)((longlong)pbVar11 + 0xe) = *(ushort *)((longlong)pbVar11 + 0xe) ^ 0xa
	FUN_180005ca0:180005f16(W		358	*(ushort *)((longlong)pbVar11 + 0x10) = *(ushort *)((longlong)pbVar11 + 0x10) ^ (
	FUN_180005ca0:180005f41(*		359	uVar12 = uVar12 + 10;
18000b08a c8 00 db [18]			360	phVar11 = (byte *)((longlong)phVar11 + 0x14);
d0 00			361) while (uVar12 < 10);
c2 00		=	362	local 740 = 0;
18000h08a [0] C8h, 0h, D0h, 0h	XOR encrypted data section contains "Powershell" string		363	local 738 = 7;
= 18000h08e [4] C2h, 0h, D5h, 0h	contains Powersheir string		364	local 750[0] = (longlong ****)0x0;
= 18000b092 [8] D4h, 0h, CFh, 0h			365	plVar23 = (longlong *) 0xffffffffffffffffffffffffffffffffffff
18000h096 [12] C2h, Oh, CBh, Oh			366	do (
18000h09a [16] CBh, Oh			367	plVar23 = (longlong *)((longlong)plVar23 + 1);

Figure 13 - Content of the environment variable and Command line arguments are stored inside the data

section as XOR encrypted.

A decryption key can be used to decrypt the data and examine the environment variables used by the loader without the execution of the malware during analysis (as shown in figure 14).

Recipe	8	l i	Î	Input
From Hex		01		c200df00d700cb00c800d500c200d5008900c200df00c2008b0087008200f700f400f400820087008a00c900c80f08300c200c900d1009d00ea00f700f400820087008a00c900c80f08300c200c900d1009d00f300ea00f700f3008500a700a700a700a700a700a700a700a700a700a
Delimiter Space				
XOR		01	11	Output
Key Øxa7		HEX -		explorer.exe, %PSS% -nop -w h "Start-Process -N -F \$env:MS -A \$env:TMPT"§§
Scheme Standard	✓ Null preserving			
Remove null bytes		0 1		

Figure 14 - Decrypted environment variable used by KamiKakaBot loader.

Execution of decrypted KamiKakaBot by Living of the Land Binary

Execution of the KamiKakaBot malware happens after the persistence stage. The detailed execution flow is described below:

• The decrypted XML payload, which was dropped into the disk, still contains some XOR encrypted data obfuscated with Base64. It is decrypted during execution time via PowerShell.

B decrypt_tmp.xml	
<pre>10 cUsingTask 11 TeskNome*svchost" 17 Teskrony*CodeTaskFactory" 13 AssemblyFile*"\$(MSBuildToolsPath)\Microsoft.Build.Tasks.v4.0.dll* ></pre>	
<pre>class clafforence Include="system" /> clafforence Include="system" /> clafforence Include="system.IO" /> clafforence Include="system.IO" /> clafforence Include="system.IO" /> clafforence Include="system.IO.compression" /> class c</pre>	<pre>XOR key "152" is stored static inade the XML Tile.</pre>
• BY UPTONIKA, WESKULZD 1333, SUPPEZER, / ZLUJY / ZLZZZBBP / C.S.MOY	Base64 encoded accion contains XOR encrypted KniilKekaBot

Figure 15 - Decrypted KamiKakaBot as XML format.

• Execution of XML payload via MSBuild.exe shows the loaded malware named as svchost.

Structure	ID	Flags	Path
✓ CLR v4.0.30319.0	6	CONCURRENT_GC, M	C:\Windows\Microsoft.NET\Framework64\v4.0.30319\MSBuild.exe_decrypt_tmp.xml
✓ AppDomain: MSBuild.exe	24985	Default, Executable	
Microsoft.Build	24985	Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\Microsoft.Build\v4.0_4.0.0.0_b03f5f7f11d50a3a\Microsoft.Build.dll
Microsoft.Build.Framework	24985	Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\Microsoft.Build.Framework\v4.0_4.0.0.0b03f5f7f11d50a3a\Microsoft.Build.Fr.
Microsoft.Build.Tasks.v4.0	24985	Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\Microsoft.Build.Tasks.v4.0\v4.0_4.0.0.0_b03f5f7f11d50a3a\Microsoft.Build.Ta.
Microsoft.Build.Utilities.v4.0	24990	Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\Microsoft.Build.Utilities.v4.0\v4.0_4.0.0.0_b03f5f7f11d50a3a\Microsoft.Build.U.
Microsoft.Internal.Tasks.Dataflow	24985		C:\Windows\Microsoft.Net\assembly\GAC_MSIL\Microsoft.Internal.Tasks.Dataflow\v4.0_4.0.0.0_b77a5c561934e089\Microsoft.
MSBuild	24985		C:\Windows\Microsoft.NET\Framework64\v4.0.30319\MSBuild.exe
svchost	24990		svchost

Figure 16 - KamiKakaBot loaded into MSBuild.exe.

Technical Analysis of KamiKakaBot

Capabilities of KamiKakaBot

📅 MSBuild.exe (8136) Properties

EclecticlQ researchers identified and analyzed new samples of .NET written malware in a February 2023 campaign.

The malware capabilities of KamiKakaBot are as follows:

• Stealing web credentials and cookies from Web browsers

MSBuild.exe	CreateFile	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Login Data
20MSBuild.exe	🐂 Read File	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Login Data
23MSBuild.exe	ReadFile	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Login Data
🖾 MSBuild.exe	🖬 Close File	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Login Data
23MSBuild.exe	💳 CreateFile	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Login Data For Account
123MSBuild.exe	≒ QueryNetworkOpenInfo.	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Login Data For Account
🖾 MSBuild.exe	⊨ CloseFile	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Login Data For Account
⊠MSBuild.exe	≒ CreateFile	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Login Data For Account
🖾 MSBuild.exe	⊨ ReadFile	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Login Data For Account
⊠MSBuild.exe	⊨ ReadFile	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Login Data For Account
🖾 MSBuild.exe	⊨ CloseFile	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Login Data For Account
🖾 MSBuild.exe	≒ CreateFile	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Network\Cookies
🖾 MSBuild.exe	≒QueryNetworkOpenInfo.	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Network\Cookies
🖾 MSBuild.exe	⊨ CloseFile	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Network\Cookies
MSBuild.exe	⊨ CreateFile	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Network\Cookies
🖾 MSBuild.exe	⊨ ReadFile	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Network\Cookies
⊠MSBuild.exe	⊨ ReadFile	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Network\Cookies
⊠MSBuild.exe	⊨ ReadFile	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Network\Cookies
MSBuild.exe	⊨ CloseFile	C:\Users\RE\AppData\Local\Google\Chrome\User Data\Default\Network\Cookies
MSBuild.exe	⊨ CreateFile	C:\Windows\Temp\wdat06F3.dat

Figure 17 - KamiKakaBot reading web browser data inside victim device.

• Performing remote code execution over cmd.exe.



Figure 18 - Disassembled KamiKakaBot has a run_command() function to execute remote commands to the victim device and receive the result of the command line data back to the attackers.

• Storing the Telegram API key and URL in an encrypted format. A new version of KamiKakaBot uses an open-source .NET obfuscation engine to hide itself from anti-malware solutions (7).

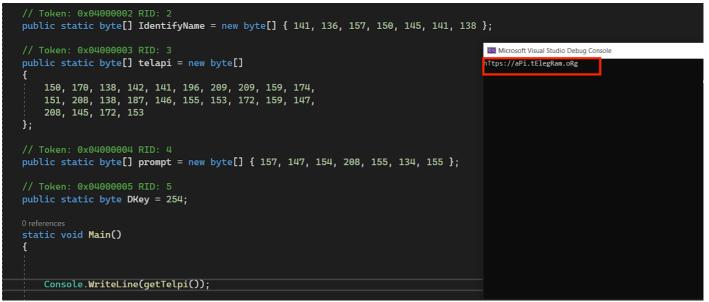


Figure 19 - Decrypted telegram URL used by malware.

After the successful infection, threat actors can update the malware itself. Figure 20 shows features of the malware, including details about delay time and commands like "COLLECTBRW',

"UPDATENEWXML" and "UPDATENEWTOKEN" very likely used for waiting these commands from attackers' C2 server.

```
// Token: 0x0400000B RID: 11
private static string APIKEY;
// Token: 0x0400000C RID: 12
private static string CHATID;
// Token: 0x0400000D RID: 13
private static string CMD_BROWS = "COLLECTBRW";
// Token: 0x0400000E RID: 14
private static string CMD_UPDATEXML = "UPDATENEWXML";
// Token: 0x0400000F RID: 15
private static string CMD_UPDATETOKEN = "UPDATENEWTOKEN";
// Token: 0x04000010 RID: 16
private static string IdentifyName = "";
// Token: 0x04000011 RID: 17
private static int DELAYTIME = 3000;
Figure
```

20 - Static variables used as config file inside the malware.

Command and Control Connection by Telegram Services

When the victim device is infected with KamiKakaBot, it starts with uploading stolen web browser data to a Telegram bot in a ZIP format and names the ZIP files with the hostname of the infected device to categorize the victim.

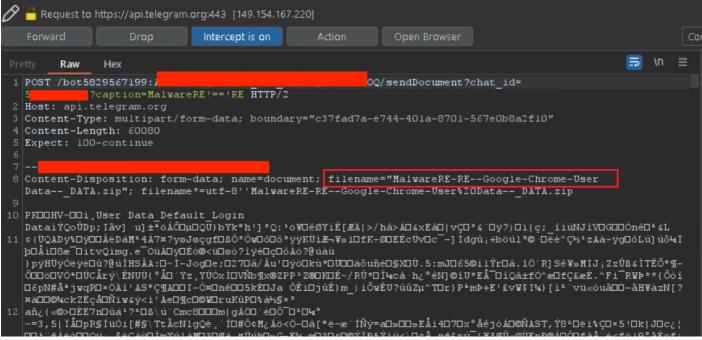


Figure 21 - Stolen browser data sent to Telegram bot.

Figure 22 shows the decompiled KamiKakaBot function named as sendFile() to perform the same feature also described in figure 21.

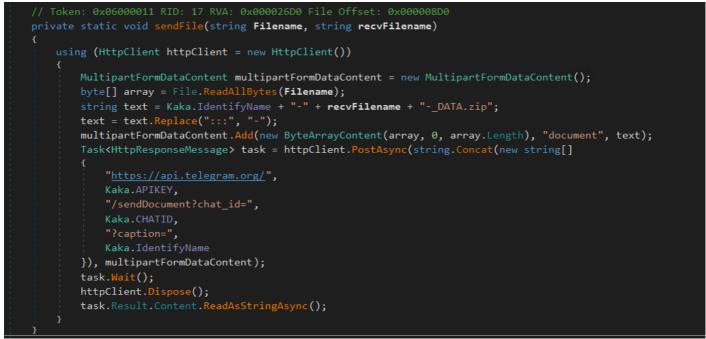


Figure 22 - Decompiled sendFile() function.

After uploading browser data from Chrome, Edge and Firefox, KamiKakaBot beacons (sends signals) to the Telegram bot showing the infected device is online and available to receive remote commands.



Figure 23 - Sending beaconing signals to Telegram bot C2 channel.

EclecticlQ researchers obtained examples of stolen web browser data from a Telegram bot controlled by the threat actors:

```
← → C 🔒 api.telegram.org/bot58295671
 {"ok":true,"result":{"file_id":"___
                                                                            ","file_size":59996,"file_path":"documents/file_9.zip"}}
 GgZWn5UYLgQ","file_unique_id":"
                                                                                    C:\Users\RE\Downloads\file_9.zip\
                                                                                        ×
                Edit View Favorites Tools He
                 Extract Test Copy Move Delete Info
              d
Add
             🎓 🚺 C:\Us
                             ads\file_9.zip\
                      rs\RE\
                 r Data_Default_Login Data
r Data_Default_Login Data For Account
ault_Network_Cookies
                                            Stolen web browser
               Default_Ne
                                               data
Figure 24 - Example of stolen web browser data.
```

Threat Actor Using VPN Services to Hide Their Identities

EclecticlQ researchers used Telegram C2 channel for sending decoy URLs that contain Canary Tokens (9) instead of real victim data, by that way when the threat actor obtained the decoy URL researchers can obtained IP addresses that is very likely used by the threat actor.

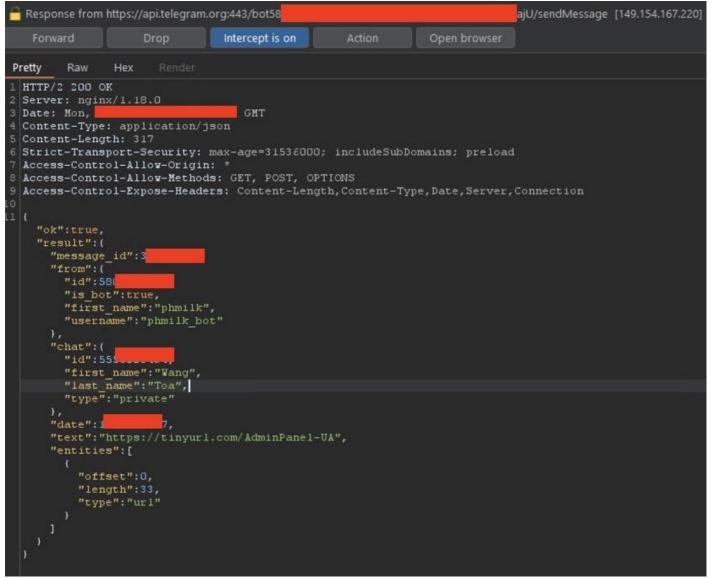


Figure 25 - Shows command and control traffic of KamiKakaBot manipulated by the researchers to send decoy Canary Token URL.

Figure 26 shows that the decoy URL is now received by Telegram C2 channel and then clicked by the threat actor which is ended up exposing their IP address after a short period of time. EclecticIQ researchers identified one of the IP addresses (206[.]123[.]151[.]133) is associated with a VPN service called PureVPN which is very likely used by the threat actor to hide their real IP address.

	Date: 2023 Feb 27 09:00:22.028683 (UTC) IP: 65.21.77.209 Channel: HTTP	65.21.77.209 ଦ୍
Geo Info		<pre>if type: "hosting",</pre>
Country	FI+=	vpn: false,
City	Tuusula	on proxy: false,
Region	Uusimaa	ea relay: false,
Organisation	AS24940 Hetzner Online GmbH	en hosting: true, service: "",
Hostname	static.209.77.21.65.clients.your-server.de	
Hostname	static.209.77.21.65.clients.your-server.de	206.123.151.133 Q
Hostname		type: "business",
Geo Info	Incident List	
	Incident List	Image: Type: "business", Image: Type: "business", Image: Type: "business", Image: Type: "business", Image: Type: Type: Type, Image: Type, Image: Type, Image: Type, Type, Image: Type, Type, Type, Image: Type, Type, Type, Type, Image: Type, Type, Type, Type, Type, Image: Type, Type, Type, Type, Type, Type, Image: Type, Ty
Geo Info	Incident List Date: 2023 Feb 27 10:03:05:456396 (UTC) IP: 206:123:151:133 Channel: HTTP	Image: Type: "business", Image: Type: Type: Type,
Geo Info Country	Incident List Date: 2023 Feb 27 10:03:05.456396 (UTC) IP: 206.123.151.133 Channel: HTTP	Image: Type: "business", Image: Type: T

Incident List

Figure 26 – Triggered Canary Tokens.

Although there is some metadata that suggest Dark Pink could be attributed to China. However, the lack of conclusive proof means this assessment of attribution is at low confidence.

EclecticlQ researchers followed the latest activities carried out by the Dark Pink APT group and identified how the group further honed its technical skills to bypass security controls, scale TTPs for, blend in with victim environments, and hinder detection across all aspects of its operations.

EclecticIQ researchers are assets that Dark Pink APT group will likely continue to evolve its behavioral evasion techniques based on its ability to creatively employ TTPs and tools to gain persistent access to targets.

Outlook

- EclecticIQ researchers analyzed the latest malware delivery campaign, very likely carried out by the Dark Pink APT group. The result of the analysis showed that the threat actors are still utilizing the same adversary tactics, techniques, and procedures (TTPs) to deliver and execute the KamiKakaBot malware, with only small changes made to the obfuscation routine to increase the infection rate and evade anti-malware solutions.
- The use of legitimate web services as a Command and Control (C2) server, such as Telegram, remains the number one choice for different threat actors, ranging from regular cyber criminals to advanced persistent threat actors. According to EclecticIQ researchers, it is very likely threat actors will continue to conduct command and control operations while hiding behind legitimate web services.
- Based on the TTPs used in this campaign, EclecticlQ researchers strongly believe that the Dark Pink APT group is very likely a cyber espionage-motivated threat actor that specifically exploits relations between ASEAN and European nations to create phishing lures during the February 2023 campaign.
- Adversary techniques like DLL side loading and use of living of the land binaries are on the rise among different threat actors to avoid being detected during the infection chain (8).

Protections and Mitigations

- Use safe DLL search mode. By default, Windows searches for DLLs in the current directory before searching in other directories. This can be changed by enabling the SafeDIISearchMode feature, which will only search in the system directory and trusted directories.
- Disable mounting ISO images via group policy (GPO). Add a simple registry key under HKEY_CLASSES_ROOT\Windows.IsoFile\shell\mount called ProgrammaticAccessOnly which would remove the context menu item when you right clicked an ISO. It also removed the functionality of double-clicking to auto-mount ISOs.
- Disable browser password saving via group policy (GPO), Set the following policies below then close the Group Policy Management Editor:
 - Disable saving browser history: Enabled
 - Enable AutoFill: Disabled
 - Enable saving password to the password manager: Disabled
 - Default cookies setting: Enabled: Keep cookies for the duration of the session
 - Enable saving password to the password manager: Disabled
- Always deploy the highest level of protection on your firewall and endpoints. In particular:
 Ensure the firewall has TLS 1.3 inspection, next-gen IPS, and streaming DPI with machine

learning and sandboxing for protection from the latest threats.

- Ensure endpoints have modern next-gen protection capabilities to guard against downloading malicious files from untrusted sources.

Detections

When some of the above-mentioned protections and mitigations cannot be implemented, the detection ideas below could help to identify potential threats early on.

- Monitor new file creations with double extension ending with executable file extensions (.exe, .vbs, .bat and etc.).
- Monitor modification and creation of Windows registry keys and sub-keys under Winlogon registry locations (HKLM\Software[\Wow6432Node\]\Microsoft\Windows NT\CurrentVersion\Winlogon\ and HKCU\Software\Microsoft\Windows NT\CurrentVersion\Winlogon\). Establishing a baseline for the values of often abused registry key locations could also improve detection accuracy.
- Establish command line baselines for command line commands of common executables, such as powershell, cmd, and other LOLBINs (including MSBuild), to identify potential malicious usage of the built-in tools.

MITRE ATT&CK

Tactic: Technique	ATT&CK Code
Execution: User Execution Malicious File	T1204
Execution: PowerShell	T1059.001
Defense Evasion: Deobfuscate/Decode Files or Information	T1140
Defense Evasion: Masquerading Double File Extension	T1036.007
Defense Evasion: Trusted Developer Utilities Proxy Execution MSBuild	T1127.001
Defense Evasion: HTML Smuggling	T1027.006

Defense Evasion: DLL Side-Loading Command and Control: Bidirectional Communication Initial Access: Spearphishing Attachment Persistence: Winlogon Helper DLL Credential Access: Credentials from Web Browsers

T1574.002 T1102.002 T1566.001 T1547.004 T1555.003

Hunting Resources: Yara Rules

About EclecticIQ Intelligence & Research Team

EclecticIQ is a global provider of threat intelligence, hunting, and response technology and services. Headquartered in Amsterdam, the EclecticIQ Intelligence & Research Team is made up of experts from Europe and the U.S. with decades of experience in cyber security and intelligence in industry and government.

We would love to hear from you. Please send us your feedback by emailing us at research@eclecticiq.com.

You might also be interested in:

QakBot Malware Used Unpatched Vulnerability to Bypass Windows OS Security Feature

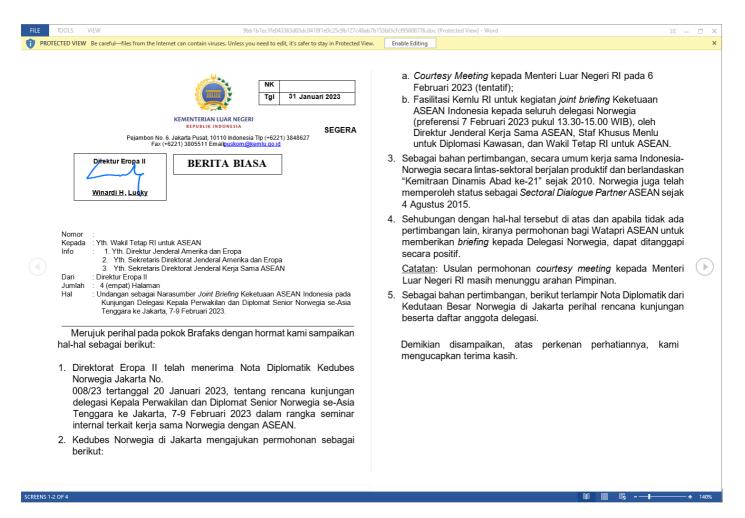
Security Service of Ukraine and NATO Allies Potentially Targeted by Russian State-Sponsored Threat Actor

Mustang Panda APT Group Uses European Commission-Themed Lure to Deliver PlugX Malware

Appendix A

Appendix B

1. Figure 5 - File Name: Another Lure, "Invitation from Perwakins Norway", plays off the Indonesia-Norway Relationship.



2. Figure 6 - File Name: Visit of Norwegian senior diplomats to Jakarta 6-9 February.



Jakarta

008/023

The Royal Norwegian Embassy in Jakarta presents its compliments to the Ministry of Foreign Affairs of the Republic of Indonesia and has the honour to inform that a delegation of Norwegian diplomats from countries in the region is planning to visit Jakarta from 7 to 9 February 2023 for an internal seminar on Norway's cooperation with ASEAN.

Please find the delegation list below:

- 1. H.E. Ms. Hilde Solbakken, Ambassador of Norway to Vietnam and Laos
- 2. H.E. Mr. Morten Paulsen, Ambassador of Norway to Malaysia and Brunei Darussalam
- 3. H.E. Mr. Paul Gulleik Larsen, Charge d'affaires Norway to Myanmar
- 4. Ms. Thea Ottmann, Deputy Head of Mission, Embassy of Norway in Bangkok
- 5. Mr. Andreas Aure, Deputy Head of Mission, Embassy of Norway in Singapore
- 6. Mr. Geir Michalsen, Deputy Head of Mission, Embassy of Norway in Manila
- 7. Mr. Tom-Jørgen Martinussen, Deputy Head of Mission, Embassy of Norway in Kuala Lumpur
- 8. Ms. Hanne Therese Tilrem, Senior Advisor, Norwegian Ministry of Foreign Affairs

In addition to the representatives from the embassies in the ASEAN region, following colleagues from the Norwegian Embassy in Jakarta will participate in the program:

- 9. H.E. Ms. Rut Krüger Giverin, Ambassador of Norway to Indonesia and Timor-Leste
- 10. H.E. Mr. Kjell Tormod Pettersen, Ambassador of Norway to ASEAN
- 11. Mr. Kristian Netland, Deputy Head of Mission, Embassy of Norway in Jakarta
- 12. Mr. Valentin Musangwa, Second Secretary, Embassy of Norway in Jakarta

3. Figure 7 - File Name: Concept note - A Sustainable Forum - Building the Research Capacity of the EAMF (ASEAN Maritime Forum) 16 Dec 2022.

	Project Classification: APSC Blueprint 2025, B.6.2.ii: Promote dialogue and cooperation on maritim issues in other ASEAN-led mechanisms, such as the Expanded ASEAN Maritime Forum while ensuri ASEAN centrality.					
ASEAN Cooperation Project Proposal	Scope:	Single Sector X	Cross-Sector			
	Pillar:					
ascan		. ,	eprint: APSC	Connectivity		
		····· / ····	aracteristic: B.6	Linkage:		
1. PROJECT DETAILS		Action Lin		Strategy:		
Proposal Identification Code:	1-6	Action(s):		Key Action(s):		
(to be completed by the ASEAN Secretariat)	Information Nature of	Confidence Building	d by the ASEAN Secretar	iat:		
Project Title: A Sustainable Forum: Building the Research Capacity of the EAMF		: Harmonisation 🔲 🗋	-			
		Special Assistance Joint Effort				
Brief Project Description – 300 words max:		Regional Integration	n / Expansion 🔲			
This project will support future EAMF hosts to draw on international expertise for analysis and research inputs for EAMF meetings. The project entails the establishment of a pool of maritime experts from universities, research centres, government agencies, and the private sector from whom the EAMF host	Type of Intervention	Policy Initiative 🔲 Establishment of In Human Capacity Bu	stitutional Mechanisms 🗌 uilding 🔲	1		
could commission substantive policy briefs. The briefs would either follow from previous EAMFs and/or inform future fora. The project will support up to three policy briefs per year, for up to five consecutive	Project Dur	ation: < 6 months	6-12 months	> 12 months X		
AMF/EAMFs (2023 – 2027) produced by experts selected from the pool. Maritime experts called upon to	Proposed 0	Proposed Commencement Date: 01.01.2023				
present their briefs would be supported by the project to travel to the EAMF. Subject to review and agreement between ASEAN and Australia, the project could be further extended for another 5 years (2028	Proposed C	completion Date: 31.	12.2032			
– 2032).	Participatin	g ASEAN Member St	tates: All X			
For the past decade, the EAMF has been a valuable Track 1.5 mechanism for the consideration and discussion of maritime issues of interest to ASEAN and its partners. Since its inception, the Forum has			y), please indicate reasor	n:		
discussed a wide array of maritime related issues including UNCLOS, maritime connectivity, maritime security and safety, as well as marine pollution, IUU fishing and management and protection of marine ecosystems.	Sectoral Co	ASEAN Body: mmittee/Main Body: ting Number/Date: / d	Senior Officials Meeting	(SOM)		
		oup/Sub-Committee:	////			
This project would support the EAMF host government to commission new research and policy analysis for reference and discussion at the Forum. The selection and prioritization of issues would be determined by the EAMF host. The pool of experts would be compiled and maintained by the project. EAMF member		ting Number/Date: / d				
states would be encouraged to propose new experts to add to the list. The list would be available to EAMF members only and will enable these governments to access relevant expertise on priority maritime-related	Proponent	s Name and Address	:			
issues.	For Departm	ent of Foreign Affairs	(DFA), Republic of the P	hilippines		
The policy briefs produced are expected to inform discussion at the Forum, improve its quality, and promote knowledge sharing among the EAMF member countries and participants. The project can also enable the deepening of EAMF members' understanding of selected maintime issues, as experts from the pool are tasked over a series of years to further research and report.	Acting Direc ASEAN-Phil DFA Bldg.,	Jahzeel Abihail G. Cruz Acting Director, ASEAN Political-Security Community Division ASEAN-Philippines National Secretariat DFA Bidg, 2330 Roxas Bivd. Pasay City, 1300 Philippines				
The project will be supported by Australia's Department of Foreign Affairs and Trade (DFAT) through the ASEAN-Australia Political Security Partnership (APSP), delivered in partnership with the Asia Foundation (TAF). Implementation of the project beyond APSP's duration will be supported through the Australia for ASEAN Futures Initiative.	Caroline Sc Deputy Hea Australian M	Eor Department of Foreign Affairs and Trade (DFAT). Australia Caroline Scott Deputy Head of Mission Australian Mission to ASEAN JJ. Patra Kuningan Raya Kav. 1-4				
Recurring Project: Yes No X		tan 12950 Indonesia				
If Yes, Previous Project Identification Code:						
	Implementi	ng Agency's Name a	nd Address (if different f	from above):		