Mirage Kitten targeting aviation and FinTech sectors across the Middle East and Africa with a new malware set

securelist.com/mirage-kitten-new-backdoors-noderabbit-pollcat/121244

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September 1, 2026

APT reports

While monitoring Mirage Kitten activity, we uncovered a previously undocumented malware family that we dubbed NodeRabbit. We identified the first sample on a system in Afghanistan. Further threat hunting revealed two additional, more advanced, variants: one on a system in Egypt and another on a system in Ethiopia.

NodeRabbit is a cross-platform remote access trojan (RAT) built with Node.js. It targets Windows, Linux, and macOS. Its operators deliver it through spear-phishing messages on LinkedIn and other job search platforms that contain trojanized coding challenge archives.

During the same investigation, we discovered another previously undocumented malware family that we dubbed PollCat. Like NodeRabbit, PollCat is a cross-platform RAT, but it is written in obfuscated JavaScript also distributed through trojanized coding challenge archives.

Mirage Kitten has historically relied on native malware written in languages such as C, C++, and Go, often deploying it through DLL search-order hijacking. NodeRabbit and PollCat represent the first publicly documented use of Node.js- and JavaScript-based malware by this APT group.

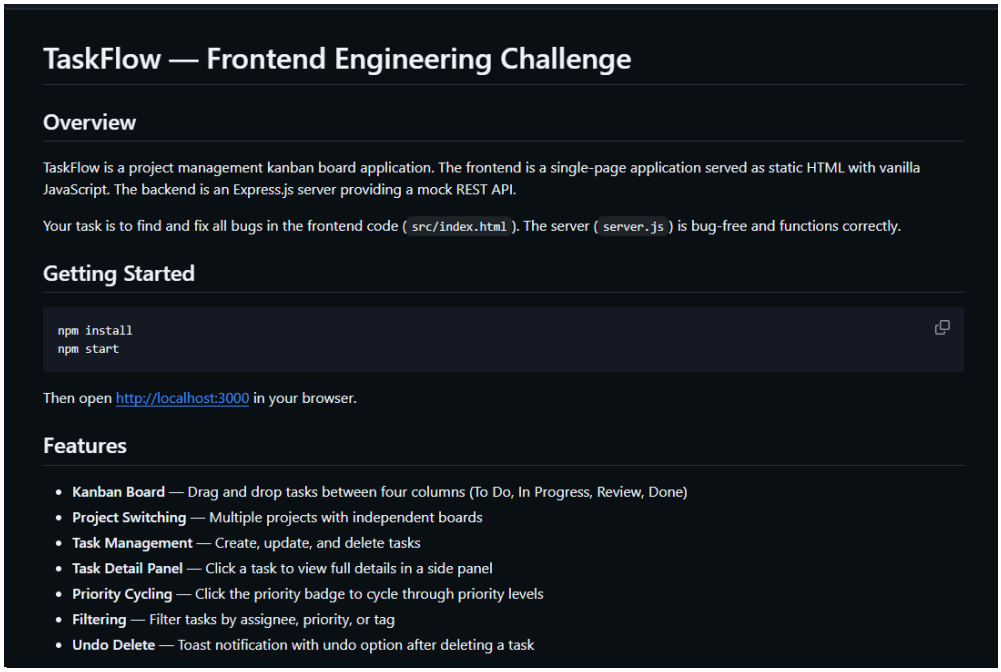
Kaspersky's products detect this threat as `Trojan.JS.MirageKitten.*`

Background

During recent threat research, we detected suspicious activity on a system in Afghanistan. We traced it to an archive containing a software development project that the user may have received during a job application process. The archive purported to contain a coding challenge for candidates applying for an engineering role.

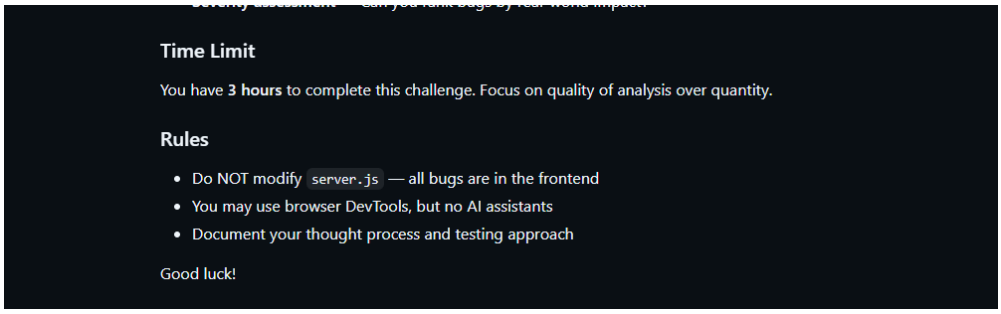
The archive, Front-Technical-Challenge.zip (MD5: `1EA83E4E4592B01E4ACAB63EB867BEE5`), was hosted in an Amazon S3 bucket at: `https://oracle-challenge.s3[.]us-east-1.amazonaws[.]com/Front-Technical-Challenge.zip`

It contained TaskFlow, an app for software engineering assessment built with Express, React, and Vite. The accompanying README instructed the candidate to review the application and fix defects in its frontend. It also claimed that `server.js` was bug-free and should not be modified, conveniently directing attention away from the only application source file the attackers had altered.



README file for a trojanized coding challenge app

The README also imposed a three-hour time limit and prohibited the use of AI assistants. Notably, an AI code-review assistant tasked with auditing the project would likely have flagged the suspicious first-line import of an unknown npm package and warned the targeted developer that the project was trojanized.



Rules and time limit included in the trojanized coding challenge app README file

The first line of `server.js` imported a trojanized npm package named `colorized_terminal`, version `2.1.0`. The attackers bundled the package directly in the challenge task archive's `node_modules` directory rather than publishing it to the npm registry. When imported, the package silently launched an implant from `node_modules/.cache/.320697f1/index.js` as a detached background process.

Retrospective threat hunting across our telemetry revealed the broader scope of the campaign. We identified three NodeRabbit variants with a shared code lineage; each was recovered from a system in a different country. The operators delivered the variants through similarly themed coding challenges and used two trojanized packages, `colorized_terminal` and `pretty-log`, both pinned to version `2.1.0`.

The campaign also delivered PollCat, a second RAT with a substantially different structure, through a separate coding challenge lure. We'll analyze PollCat later in this research.

Initial access

The infection chain begins with fake recruiter accounts contacting prospective targets on a job search platform. According to a publicly cited source, a threat actor posing as a talent acquisition specialist at a major technology company contacted a software engineer and advertised a job opening, inviting the target to complete a technical assessment.

The target received a link to a coding challenge hosted on Amazon S3 and was pressured to download and run the project immediately. This public post matches the delivery chain we reconstructed from our telemetry: recruiter outreach on a job search platform, a coding challenge presented as a technical assessment, and a trojanized project archive hosted on legitimate cloud infrastructure.

NodeRabbit RAT: the first variant

We discovered the first NodeRabbit variant on a system in Afghanistan. The malware was concealed within the TaskFlow assessment at `node_modules/.cache/.320697f1/index.js` and executed by the trojanized `colorized_terminal` package.

Once running, NodeRabbit generates a unique agent identifier from available host information. It calculates the SHA-256 hash of the hostname, username, operating system version, architecture, and MAC address, then truncates the result to its first 32 hexadecimal characters.

NodeRabbit binds a TCP listener to `127.0.0.1:48739`. This listener acts as a single-instance mechanism. If the malware cannot bind to the port, it assumes that another instance is already running and terminates silently.

NodeRabbit uses a persistence mechanism for each operating system:

Operating system	Persistence mechanism
Windows	Copies itself to `%APPDATA%\Microsoft\EdgeUpdate\msedge_update.js`; clones the local `node.exe` to `nodew.exe` in the same folder and patches its PE subsystem from Console to Windows GUI to suppress the console window; creates `HKCU\Software\Microsoft\Windows\CurrentVersion\Run\MicrosoftEdgeUpdate` registry key executing `nodew.exe msedge_update.js`
Linux	Copies itself to `~/.config/microsoft-edge-update/msedge_update.js` and creates an `@reboot` cron entry that invokes the script using the current Node.js executable.
macOS	Copies itself to `~/.config/microsoft-edge-update`, creates `~/Library/LaunchAgents/com.microsoft.edgeupdate.plist` configuration file pointing at the copy's location with `RunAtLoad` and `KeepAlive` parameters, and attempts to load it.

The malware communicates with its command-and-control servers through three API endpoints, choosing from the following Azure-hosted C2 infrastructure addresses. On failure, it switches to the next C2 address:

```
1. https://plugplay.azurewebsites[.]net
2. https://Rgbteller.azurewebsites[.]net
3. https://Wslwebui.azurewebsites[.]net
```

Method	Endpoint	Purpose
POST	/api/rabbit/checkin	Register agent and host info
POST	/api/rabbit/task	Poll for commands
POST	/api/rabbit/result	Submit results

NodeRabbit serializes each C2 request object as JSON and wraps it with AES-256-GCM. The AES key is the SHA-256 digest of an ASCII seed embedded into the agent. Every request uses a fresh 12-byte IV and a 16-byte authentication tag:

The malware sends encrypted requests using the following structure:

```
{
  "d": "base64(IV || ciphertext || authentication_tag)",
  "_r": "8 hexadecimal characters",
  "_t": "epoch timestamp"
}
```

C2 responses are structured the same way and may contain a command to execute. We observed the first NodeRabbit variant supporting 11 commands:

Command	Functionality
sys:info	Return hostname, domain user information, username, and process ID.
proc:list	List running processes.
proc:start	Execute an arbitrary shell command.
fs:list	List a directory.
fs:read	Read a file in chunks and return Base64 data.
fs:write	Decode Base64 and write it at a chosen file offset.
fs:delete	Delete a file or recursively delete a directory.
fs:mkdir	Create directories recursively.
net:config	Enumerate adapters, MAC addresses, IP addresses, and DNS settings.
agent:sleep	Change the beacon interval.
script:exec	Write a base64 Node.js script to a randomly named .tmp file, execute it and delete it.

NodeRabbit RAT: the second variant

Retrospective threat hunting following the discovery in Afghanistan led us to a second infection on a system in Egypt. This sample is a more advanced NodeRabbit variant, launched through the trojanized `pretty-log` package instead of `colorized_terminal`.

Before running its core functionality, the malware checks whether the host resembles an analysis environment. It terminates if it detects limited system memory, a low CPU count, short system uptime, analyst-associated usernames or hostnames, or common analysis tools running on the system.

Before terminating, the malware generates benign `HEAD` requests to `www.google.com, www.microsoft.com`, and `www.cloudflare.com`, then exits without ever contacting its C2 infrastructure. Most likely, it attempts to look less suspicious by showing some benign activity before exiting.

Variant 2 implements partial corporate proxy support: it checks HTTP(S) proxy environment variables, Windows Internet Settings, including an explicit PAC URL, and WinHTTP configuration; tunnels its HTTPS C2 through `HTTP CONNECT`. It first tries to establish an unauthenticated connection. If it fails, it retries using URL-embedded basic credentials. Finally, it delegates Windows NTLM/Negotiate challenges to `curl.exe --proxy-anyauth --proxy-user`. It caches the proxy-discovery result, including when no proxy is found, for five minutes. If the polling loop detects a network-interface or IP-address change, it clears the cache and runs proxy discovery again on the next checkin.

To make sure a single instance is running, Variant 2 uses a host-specific port derived from the agent identifier instead of the fixed TCP port used by the first variant. It interprets the first four hexadecimal characters of the identifier as an integer and applies the following calculation: `41984 + (value mod 5000)`.

The resulting listener port falls between `41984` and `46983`. Unlike the shared port used by Variant 1, this port varies depending on the infected host.

For persistence, Variant 2 masquerades as Intel Driver & Support Assistant. The exact persistence mechanism, once again, depends on the operating system.

Operating system	Persistence mechanism
Windows	Copies itself to `%LOCALAPPDATA%\Intel\DSA\idriver_support.js`. It then copies the local `node.exe` binary to `IntelDSA.exe` and changes its PE subsystem from Console to Windows GUI, suppressing the console window. Finally, it creates a scheduled task named `IntelDriverSupportUpdate`, which runs daily at `10AM` and executes `IntelDSA.exe` with the dropped script.
Linux	Copies itself to `~/.config/intel-dsa/idriver_support.js` and creates an `@reboot` cron entry.
macOS	Copies itself to `~/Library/Application Support/Intel DSA/idriver_support.js` and creates the LaunchAgent `com.intel.dsa.helper` with RunAtLoad and KeepAlive enabled.

NodeRabbit RAT: the third variant

Further threat hunting identified a third NodeRabbit variant on a system in Ethiopia. Like the second variant, it is launched through the trojanized `pretty-log` package. It retains much of the previous variant's functionality but introduces significant changes to its command-and-control configuration, command set, and persistence mechanisms.

The third variant communicates with its C2 infrastructure through a different set of API endpoints:

Method	Endpoint	Purpose
POST	/sdk/v2/ready	Register agent and host info
POST	/sdk/v2/config	Poll for commands
POST	/sdk/v2/events	Submit results

We observed the malware using a C2 chain composed of Azure- and Cloudflare-hosted domains.

1. https://visitfinancedentists[.]com
2. https://kyrasey-f8hfexa5cqamh7fk.westeurope-01.azurewebsites[.]net
3. https://healthcomfsdpower[.]com

For persistence, Variant 3 implements the following mechanisms depending on the operating system in use:

Operating system	Persistence mechanism
Windows	Attempts to copy the payload to `ProgramData` or `LocalAppData`, create a build-specific daily 10AM task, and start the copied payload. To choose the exact directory, it tries to list `C:\Windows\System32\config`. If successful, it selects `ProgramData` with `/ru SYSTEM /rl highest`; in case of a failure, it selects LocalAppData without explicit `/ru` or `/rl` settings.
macOS	Copies the payload to `~/Library/Application` Support, creates and loads a `RunAtLoad/KeepAlive` LaunchAgent and starts the copied payload.
Linux	Copies the payload to `~/.local/share`, attempts to add an `@reboot` cron entry, and starts the copied payload. If `crontab -l` fails, persistence is skipped.
WSL	Uses the payload copied for persistence on the main Linux system, as described above. Writes `launcher.vbs` under the Windows user profile, and creates a daily 10AM Windows task that relaunches it through `wscript.exe` and `wsl.exe`.

A new command, `agent:servers`, replaces the active in-memory C2 server list and can write the updated list to `.sv.json`. The third variant retains the original 11 commands and adds 12 new ones, bringing the total to 23.

New commands	Functionality
fs:drives	Enumerate accessible Windows drive letters or WSL-mounted drives
proc:exec	Execute a process
proc:kill	Kill process by PID or image name
agent:servers	Replace the active C2 and attempt to keep the new configuration
agent:getchain	Return the current C2
outlook:emails	Harvest account addresses from Outlook OST and PST artifacts
persist:check	Check selected VS Code, scheduled-task, and Run-key persistence indicators
persist:vscode	Attempt to install a fake VS Code extension and Windows Run value

persist:vscode:remove	Remove the fake extension
persist:projects:scan	Search recent and common development locations for Git repositories
persist:project:inject	Inject a launcher into a repository's Git hooks
persist:project:remove	Remove the marked Git-hook launcher

Beyond the persistence mechanisms described above, Variant 3 introduces two additional persistence mechanisms that relaunch the malware through common developer workflows.

1. Malicious VS Code extension

The `persist:vscode` command first copies the payload to its build-specific install path. If a compatible extension directory exists, it creates a fake extension displayed as `GitHub Copilot Helper`, with the description `AI coding assistant helper service` and the activation event on `StartupFinished`.

The extension's `extension.js` file attempts to start the installed payload as a detached Node.js process. To look less suspicious to the user, it uses a trusted publisher name borrowed from local extension metadata or a `trustedPublishers` value found in `state.vscdb`. However, no signature or trusted status is copied.

Separately, the handler tries to disable Workspace Trust if the VS Code User directory exists. On Windows, it attempts to establish persistence using a current-user Run registry key value even if the extension directory is missing.

2. Git hook injection

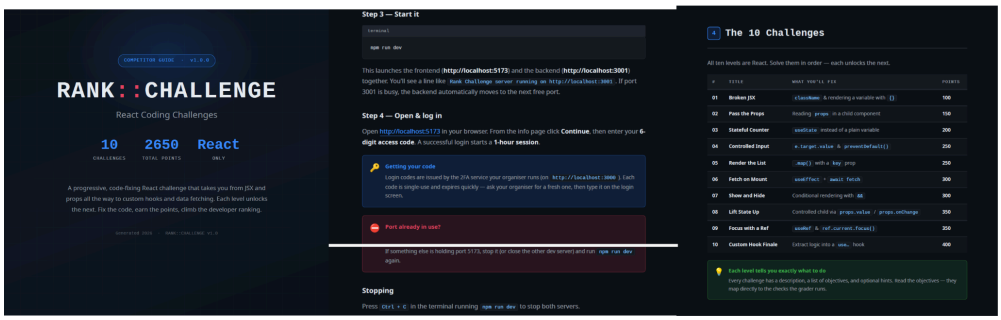
Git-hook persistence works in two steps. First, `persist:projects:scan` checks recent VS Code workspace paths directly. Under common locations such as `~/projects` and `~/source`, it checks only the first 60 immediate children, not the root itself, and returns no more than 20 repositories.

For a selected repository, `persist:project:inject` appends a marked launcher to `.git/hooks/post-merge` and `.git/hooks/post-checkout` by default. The marker is `# shepherd-persist;` the line following the marker attempts to start the installed payload with Node in the background. A later Git operation must trigger one of those hooks, and the referenced Node executable and payload must still exist.

PollCat RAT

While tracking NodeRabbit infections, we discovered another malicious tool we dubbed PollCat, which is also distributed under the guise of a programming challenge. The sample we obtained resides inside `RankChallenge-react`, a React code-fixing challenge presented as a time-limited developer assessment. Running the project invokes `npm i && node index.js`, which starts the local application and attempts to open the challenge in the user's browser.

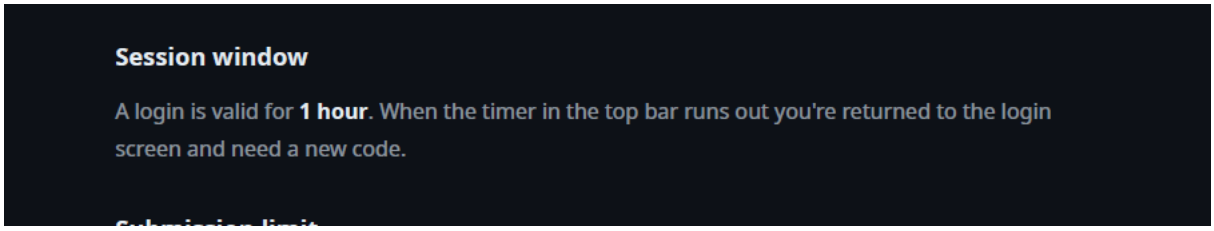
Although the visible exercise is not a security CTF, the project uses CTF terminology in several places. The root package is named `ctf-server`, the backend prints `CTF server running`, the frontend uses several `ctf-*` storage keys, and the tutorial refers to `path/to/ctf`. These repeated labels, together with instructions that do not fully match the delivered application, are consistent with an AI-assisted or template-generated project. One possible explanation is that the attacker prompted an AI coding assistant to create a CTF-style React platform and later inserted the malicious components.



README instructions and challenge overview included in the trojanized React coding project

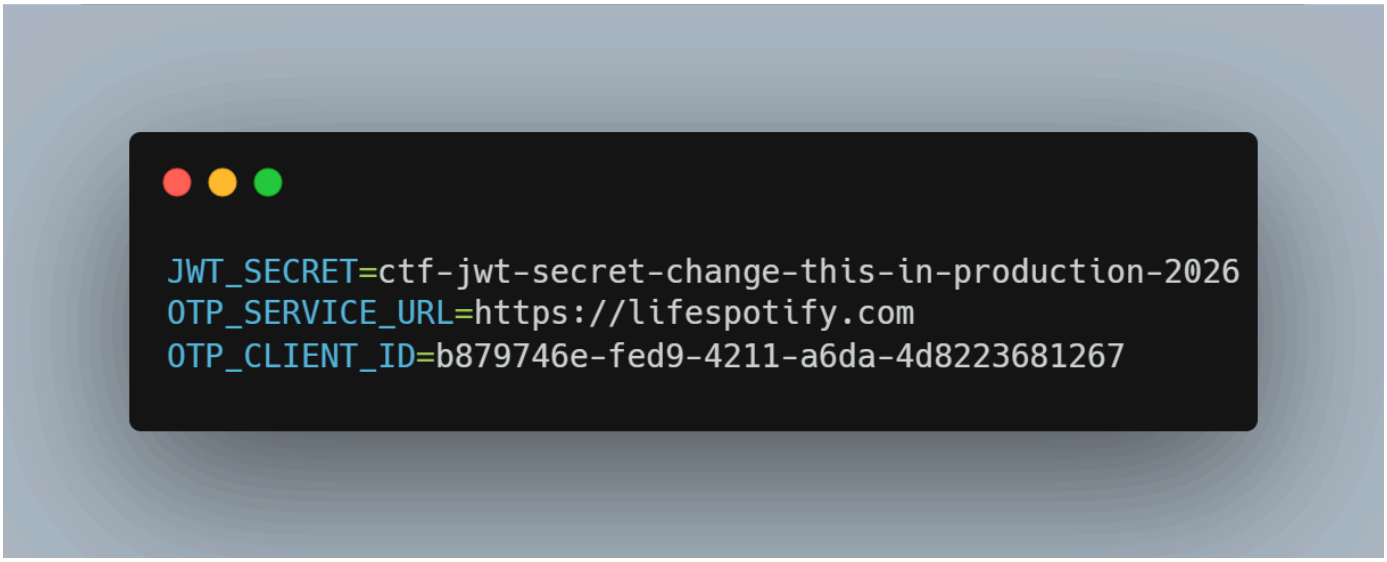
The PDF tutorial contained in the same archive as the project tells the target to click `Continue`, enter a six-digit OTP code, and complete the challenge within a one-hour session. It states that codes are supplied by the recruiter, are single-use, and expire quickly; the visible login page also claims that codes rotate every 30 seconds. In the delivery scenario described by the investigation, the threat actor posing as a recruiter could

provide the code directly to the targeted developer. This gives the operator control over access to the lure, while the expiring code and countdown create a sense of urgency, pressuring the target to run the project and complete the assessment quickly, potentially accelerating the infection process.



One-hour session window enforced by the trojanized coding challenge

The bundled `.env` file contains the JWT signing secret, OTP service URL, and OTP client ID.



Configuration embedded in .env file of the trojanized coding project, including the OTP service URL and client identifier

The application forwards submitted codes to an attacker-managed domain registered in late June-2026: `https://lifespotify[.]com/api/users/b879746e-fed9-4211-a6da-4d8223681267/otp/validate`.

That said, PollCat starts independently of the OTP authentication process. During application startup, `app.js` loads `requireAuth.js`, which imports and immediately starts the malicious `requireObjects.js` component. PollCat can therefore begin C2 registration and command polling while the application is still loading, before the user enters an access code.

A failed OTP validation prevents the user from accessing the protected challenge features, but PollCat continues running in the background. A successful OTP validation issues a JWT and creates another worker that starts an additional PollCat instance. The first authenticated request also triggers the persistence attempt.

Persistence starts when the first request carrying a valid JWT reaches the protected middleware. PollCat then uses one of the following methods:

Operation system	Persistence mechanism
Windows	Writes package.json and requireObject.js to %APPDATA%\Microsoft\Network, runs npm install, and creates a daily task named NetSync_<username> and scheduled for 09AM that runs the worker with Node.js.
Linux	Writes the worker to ~/.node_packages, runs npm i, and appends both a daily 09AM cron line and an @reboot line.
macOS	Uses the same ~/.node_packages copy and cron path, then creates and loads ~/Library/LaunchAgents/com.harsh.requireobject.plist with RunAtLoad and a daily 09AM trigger.

Once active, PollCat identifies the host as `129--<hostname>` and iterates over the following C2s until registration succeeds:

```
1. https://sahi-finance[.]com
2. https://GamebarAppinformation[.]azurewebsites[.]net
3. https://GamebarApp[.]azurewebsites[.]net
```

To register, it sends the following HTTP request to the C2:

```
POST /beacon HTTP/1.1
Host: <c2-host>
Content-Type: application/json
{"clientId":"<client-id>","type":"poll","pcName":"<hostname>","userName":"<username>"}

```

On successful registration, PollCat expects an unusual HTTP 400 response containing a socket identifier and optional timing values:

```
HTTP/1.1 400
Content-Type: application/json
{"socketId":"<socket-id>","pollInterval":<poll-interval-ms>,"jitterTime":<jitter-ms>}

```

After registration, PollCat sends host information to `/gate/hello`, polls `/gate/fetch` for commands, and returns results through `/gate/submit`. All endpoints in use are presented in the table below.

Method	Endpoint	Purpose
POST	/beacon	Register the client and obtain a socketId and optional timing values.
POST	/gate/hello	Submit host, user, domain, OS information, and its current privilege level.
GET	/gate/fetch?token=<socketId>	Poll for commands.
POST	/gate/submit	Submit a Base64-encoded command-result structure.
GET	/vault/<uuid>	Retrieve a hosted file and write it to the victim machine.
PUT	/vault/push/	Upload a local file or file chunk to the C2.
POST	/gate/track	Report chunk-upload progress.

By default, PollCat RAT polls every two minutes with up to five seconds of jitter. Commands and results are stored as little-endian binary records and carried as Base64 text.

PollCat RAT declares 22 commands, but three of them have no implementation:

Command	Functionality
0x02 (DIR)	List a directory.
0x03 (MV)	Move a file or directory.
0x04 (RUN)	Execute a shell command.
0x05 (TASKLIST)	List running processes.
0x06 (DEL)	Delete a file or directory.

0x07 (UPLOAD)	Download a file from the C2 to the victim's machine.
0x08 (DOWNLOAD)	Upload a local file to the C2.
0X09 (DRIVES)	List drives, volumes, or mount points.
0X0A (TERMINATE)	Terminate a process by PID.
0X0B (RUNDLL)	Load a DLL and call an exported function on Windows.
0X0C (MKDIR)	Create a directory.
0X0D (ZIP)	Create or extract a ZIP archive.
0X0E (CHUNKED_DOWNLOAD)	Upload a local file in chunks.
0X0F (RUN_HIDDEN)	Start a hidden background process.
0X20 (EVAL_JS)	Execute JavaScript supplied by the C2.
0X30 (SYSTEM_CHECK)	Collect process and software inventory.
0XA1 (WS_DOWNLOAD)	Defined but not implemented.
0xB0 (REQUEST_ELEVATION)	Defined but not implemented.
0XB1 (PERSIST)	Defined but not implemented.
0xF0 (SET_SLEEP_TIME)	Change the polling interval.
0XF1 (SET_IDLE_TIME)	Store an idle-time value.
0xF2 (SET_JITTER_TIME)	Change polling jitter.

The command names `UPLOAD`, `DOWNLOAD`, and `CHUNKED_DOWNLOAD` are written from the C2's perspective. `UPLOAD` sends a C2-hosted file to the victim's machine, while the two download commands transfer victim files back to the C2.

`EVAL_JS` runs JavaScript supplied by the C2 and gives that code access to Node.js modules, files, processes, networking, and child-process functions.
`SYSTEM_CHECK` collects the names of running processes and lists files and folders from:

- %SystemDrive%\Program Files
- %SystemDrive%\Program Files (x86)
- %LOCALAPPDATA%
- %LOCALAPPDATA%\Programs
- %APPDATA%
- %USERPROFILE%
- %APPDATA%\Microsoft\Outlook
- %LOCALAPPDATA%\Microsoft\Olk\Attachments
- %USERPROFILE%\Documents

It also searches for folders matching 24 hardcoded strings corresponding to security software vendor names: 'Google', 'Microsoft', 'Palo Alto Networks', 'Cisco', 'VMware', 'Fortinet', 'Citrix', 'CheckPoint', 'Juniper Networks', 'LogMeIn', 'Sophos', 'Symantec', 'Trend Micro', 'McAfee', 'Kaspersky Lab', 'ESET', 'Bitdefender', 'Avast Software', 'CrowdStrike', 'SentinelOne', 'Malwarebytes', 'BraveSoftware', 'Tencent', and 'Naver'.

When PollCat finds a matching folder, it lists that folder's root contents. It does not recursively scan the entire product directory. The detailed inventory, including process names, directory listings, and collected paths, is sent as JSON to POST `/api/system-details/result`.

Infrastructure

Mirage Kitten continues to rely on Azure Websites and Cloudflare-backed domains to hinder infrastructure discovery and tracking. More importantly, the use of Microsoft Azure subdomains for C2 helps the traffic blend into legitimate organizational network activity. In some cases that we encountered during our research, the actors even incorporated the targeted organization's name into the Azure subdomain, making C2 communications appear more like normal business traffic originating from an employee machine during regular business days.

Domain	Registrar	ASN	Malware sample
naturalapplication.azurewebsites[.]net retaildemo.azurewebsites[.]net tubitak.azurewebsites[.]net	MarkMonitor Inc.	AS 8075	NodeRabbit RAT sample 1
rgbteller.azurewebsites[.]net wslwebui.azurewebsites[.]net plugplay.azurewebsites[.]net	MarkMonitor Inc.	AS 8075	NodeRabbit RAT sample 2
crossdwm.azurewebsites[.]net wdisystem.azurewebsites[.]net wslmenus.azurewebsites[.]net	MarkMonitor Inc.	AS 8075	NodeRabbit RAT sample 3
dnshnsdev.azurewebsites[.]net hpjumpsrv.azurewebsites[.]net storview.azurewebsites[.]net	MarkMonitor Inc.	AS 8075	NodeRabbit RAT sample 4
healthcomfsdpower[.]com visitfinancedentists[.]com	NameCheap, Inc.	AS 13335	NodeRabbit RAT sample 5
kyrasey-f8hfexa5cqamh7fk.westeurope-01.azurewebsites[.]net	MarkMonitor Inc.	AS 8075	
greenyjsgfd.azurewebsites[.]net helptellerbls.azurewebsites[.]net timedrv.azurewebsites[.]net userwellgtfs.azurewebsites[.]net	MarkMonitor Inc.	AS 8075	NodeRabbit RAT sample 6
hecowime-aqdphyd4bbdef6es.westeurope-01.azurewebsites[.]net msmanagementgrp[.]com msmanagementgrpmedia[.]com	MarkMonitor Inc.	AS 8075	NodeRabbit RAT sample 7
lifespotify[.]com	Dynadot	AS 8075	PollCat RAT
gamebarapp.azurewebsites[.]net gamebarappinformation.azurewebsites[.]net	MarkMonitor Inc.		
sahi-finance[.]com	NameCheap, Inc.		

Based on our analysis of Mirage Kitten's infrastructure, we identified certain patterns across several command-and-control channels, including `msmanagementgrp[.]com` and `visitfinancedentists[.]com`

Further investigation based on these patterns led to the discovery of approximately 11 additional infrastructure assets attributed to the same group.

Domain	Creation date	Registrar
healthful-hub[.]com	2026-07-03	NameCheap, Inc.
neumedicahealthcare[.]com	2026-07-03	NameCheap, Inc.
optimumhealthcredit[.]com	2026-07-03	NameCheap, Inc.
healthfullyrecipes[.]com	2026-06-30	NameCheap, Inc.
refreshhealthandwellness[.]com	2026-06-09	NameCheap, Inc.
healthvitalitycare[.]com	2026-05-18	NameCheap, Inc.
aceofspadesmanagement[.]com	2026-05-18	NameCheap, Inc.
glmediaagency[.]com	2026-05-18	NameCheap, Inc.
digimediaskill[.]com	2026-05-18	NameCheap, Inc.
healthyweightplan[.]com	2026-05-18	NameCheap, Inc.
mens-health-online[.]com	2026-05-15	NameCheap, Inc.

Victims

Based on our telemetry, we identified victims in fintech, aviation and aerospace sectors across the Middle East and Africa – specifically, in Egypt, Ethiopia and Afghanistan.

We also observed submissions of ZIP archives with trojanized projects containing NodeRabbit and PollCat to an online multi-scanner originating from several countries, including India, Türkiye, Israel, Iraq, Germany, and Ireland.

Attribution

We attribute this activity to Mirage Kitten with a high degree of confidence based on the following observations:

1. 1 Structural similarities with the Retrograde/MiniFast native DLL backdoor (MD5:`810F8E3B88EB05F710C09552941D6F56`)
   - Initial C2 handshake and session establishment logic. Both PollCat and Retrograde/MiniFast follow a similar C2 handshake flow. Each builds a JSON request body containing host information and sends it via an HTTP `POST` request. Notably, both treat HTTP 400 as a successful handshake response rather than an error, parsing the response body to extract a `socketId`, which is then stored and used as the session token for subsequent C2 communication.

Similar C2 handshake and socketId session establishment logic in MiniFast/Retrograde and PollCat

   - Host registration. Both PollCat and Retrograde/MiniFast register the infected host with the C2 server by sending a structurally similar JSON request body containing the session token and host information.

Malware	Host registration request body
PollCat	{“token”:”<socketId>”,”pcName”:”<host>”,”userName”:”<user>”,”domainName”:”<domain>”,”os”:”<os>”,”isElevated”:fals
MiniFast/Retrograde	{“token”:”<socketId>”,”pcName”:”<host>”,”userName”:”<user>”,”domainName”:”<USERDOMAIN>”,”isElevated”:<bool>}

   - Command fetching similarities. The similarities extend to command retrieval. Both PollCat and Retrograde/MiniFast periodically poll the C2 server using an HTTP GET request containing the previously assigned `socketId` as a token. Retrograde/MiniFast uses `GET /agent/poll?token=<socketId>`, while PollCat follows the same pattern with `GET /gate/fetch?token=<socketId>`, demonstrating a closely aligned C2 communication structure.
   - Beacon timing similarities. PollCat and the Retrograde/MiniFast share identical beacon timing defaults: a polling interval of 120,000 ms (`0x1D4C0`), a jitter of 5,000 ms (`0x1388`), and a retry timeout of 60,000 ms (`0xEA60`). This further highlights the structural similarities between the two C2 communication implementations.
   - Command set similarities. PollCat and Retrograde/MiniFast share several commands and command IDs. Notably, PollCat declares `REQUEST_ELEVATION (0xB0)` and `PERSIST (0xB1)` but does not implement them. In MiniFast, both are functional: `0xB0` performs UAC elevation, while `0xB1` creates the `WindowsSecurityUpdate` scheduled task for persistence.

Command set similarities between MiniFast/Retrograde and PollCat, including shared command identifiers

   - Proxy authentication similarities. NodeRabbit delegates corporate-proxy NTLM/Negotiate authentication to `curl.exe --proxy-anyauth --proxy-user`, using the victim’s logon session. Retrograde/MiniFast native DLL implements the same approach natively through `WinHttpQueryAuthSchemes` and `WinHttpSetCredentials` with NULL credentials. This shared proxy-aware C2 design suggests the same development approach across both malware families.
2. 2 Speaking of victimology, the attacks are consistent with Mirage Kitten’s known geographic targeting, with the group maintaining a strong focus on entities across Africa and the Middle East, this time with a particular focus on the aviation and FinTech sectors.

3. 3 As for the operational infrastructure, Mirage Kitten has historically hosted its initial ZIP lures on legitimate third-party services. Previously, it used `onlyoffice.com` for this purpose. In this activity, the group shifted to Amazon S3 buckets.
4. 4 Finally, the combination of Azure Websites and Cloudflare-backed domains has been a hallmark of Mirage Kitten's TTPs, which we have observed across NodeRabbit and PollCat.

Conclusions

Mirage Kitten's latest activity marks a notable evolution in the group's tooling: NodeRabbit and PollCat are the group's first Node.js/JavaScript-based implants, departing from its usual native malware deployed through DLL search-order hijacking. The shift to cross-platform scripting gives the operators a single codebase that runs on Windows, Linux, and macOS, with payloads that blend naturally into developer workstations.

The delivery mechanism, however, remains consistent with Mirage Kitten's historical tradecraft: the use of recruiter personas on LinkedIn to target critical sectors across the Middle East and Africa for cyberespionage purposes. We continue to track the group's activity and will report on new developments in future publications.

Indicators of compromise

Additional IoCs are available to customers of our Threat Intelligence Reporting service. For more details, contact us at intelreports@kaspersky.com.

File hashes

CBAAF0900A13F28E380F49ADECEC932C FrontEnd-Task.zip
1EA83E4E4592B01E4ACAB63EB867BEE5 Front-Technical-Challenge.zip
366515822D5AC1CC500711EF57A2E32E Task-FullStack.zip
CF449F1992C2819E62AC44A0B06AC2E7 fullstack-1536.zip
E95A4366686E3F786EA3C056FAB5B0DA webapp76592.zip
DE5AF16A3757EF700B01DC34D67079AE webapp76531.zip
BE086789568441D0D7E4679AEE51F566 challenges-17831.zip
E259C5EDF158AAC4CFE14F77DDD0B196 challenges-17832.zip
291AC3ABE73C5158E59A437B75D5F0AA Project-1802.zip
0962F56D7EC69F4F2A0162DCBE22116B Case-34234.zip
795E053A990A1569FFDCB57F48F6D085 RankChallenge-react-6uJSX3-main.zip

Domains and IPs

oracle-challenge.s3[.]us-east-1.amazonaws[.]com
naturalapplication.azurewebsites[.]net
retaildemo.azurewebsites[.]net
tubitak.azurewebsites[.]net
rgbteller.azurewebsites[.]net
wslwebui.azurewebsites[.]net
plugplay.azurewebsites[.]net
crossdwm.azurewebsites[.]net
wdisystem.azurewebsites[.]net
wslmenus.azurewebsites[.]net
dnshnsdev.azurewebsites[.]net
hpjumpsrv.azurewebsites[.]net
storview.azurewebsites[.]net
healthcomfsdpower[.]com
visitfinancedentists[.]com
kyrasey-f8hfexa5cqamh7fk.westeurope-01.azurewebsites[.]net
greenyjsgfd.azurewebsites[.]net
helptellerbls.azurewebsites[.]net
timedrv.azurewebsites[.]net
userwellgtfs.azurewebsites[.]net
hecowime-aqdphyd4bbdef6es.westeurope-01.azurewebsites[.]net
msmanagementgrp[.]com
msmanagementgrpmedia[.]com
lifespotify[.]com

gamebarapp.azurewebsites[.]net
gamebarappinformation.azurewebsites[.]net
sahi-finance[.]com
healthful-hub[.]com
neumedicahealthcare[.]com
optimumhealthcredit[.]com
healthfullyrecipes[.]com
Refreshhealthandwellness[.]com
healthvitalitycare[.]com
aceofspadesmanagement[.]com
glmediaagency[.]com
digimediaskill[.]com
healthyweightplan[.]com
mens-health-online[.]com

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From the same authors

Mirage Kitten targets Middle East and Africa region with new malware