NETMANAGEIT

Intelligence Report Threat Actors Exploit Adobe ColdFusion CVE-2023-26360 for Initial Access to Government Servers

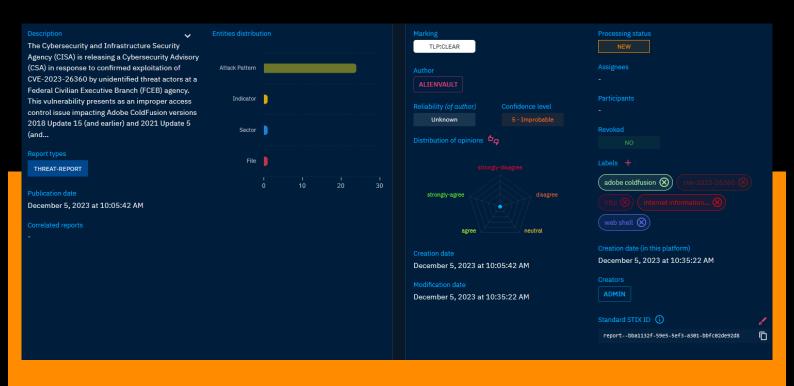




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Overview

Description

The Cybersecurity and Infrastructure Security Agency (CISA) is releasing a Cybersecurity Advisory (CSA) in response to confirmed exploitation of CVE-2023-26360 by unidentified threat actors at a Federal Civilian Executive Branch (FCEB) agency. This vulnerability presents as an improper access control issue impacting Adobe ColdFusion versions 2018 Update 15 (and earlier) and 2021 Update 5 (and earlier). CVE-2023-26360 also affects ColdFusion 2016 and ColdFusion 11 installations; however, they are no longer supported since they reached end of life. Exploitation of this CVE can result in arbitrary code execution. Following the FCEB agency's investigation, analysis of network logs confirmed the compromise of at least two public-facing servers within the environment between June and July 2023.

Confidence

This value represents the confidence in the correctness of the data contained within this report.

15 / 100

4 Overview

Content

N/A

5 Content

Attack-Pattern

Name

Process Discovery

ID

T1057

Description

Adversaries may attempt to get information about running processes on a system. Information obtained could be used to gain an understanding of common software/applications running on systems within the network. Adversaries may use the information from [Process Discovery](https://attack.mitre.org/techniques/T1057) during automated discovery to shape follow-on behaviors, including whether or not the adversary fully infects the target and/or attempts specific actions. In Windows environments, adversaries could obtain details on running processes using the [Tasklist](https://attack.mitre.org/software/S0057) utility via [cmd](https://attack.mitre.org/software/S0106) or `Get-Process` via [PowerShell](https://attack.mitre.org/techniques/T1059/001). Information about processes can also be extracted from the output of [Native API](https://attack.mitre.org/techniques/T1106) calls such as `CreateToolhelp32Snapshot`. In Mac and Linux, this is accomplished with the `ps` command. Adversaries may also opt to enumerate processes via /proc. On network devices, [Network Device CLI](https://attack.mitre.org/techniques/T1059/008) commands such as `show processes` can be used to display current running processes.(Citation: US-CERT-TA18-106A)(Citation: show_processes_cisco_cmd)

Name

OS Credential Dumping

ID

T1003

Description

Adversaries may attempt to dump credentials to obtain account login and credential material, normally in the form of a hash or a clear text password, from the operating system and software. Credentials can then be used to perform [Lateral Movement](https://attack.mitre.org/tactics/TA0008) and access restricted information. Several of the tools mentioned in associated sub-techniques may be used by both adversaries and professional security testers. Additional custom tools likely exist as well.

Name

Boot or Logon Autostart Execution

ID

T1547

Description

Adversaries may configure system settings to automatically execute a program during system boot or logon to maintain persistence or gain higher-level privileges on compromised systems. Operating systems may have mechanisms for automatically running a program on system boot or account logon.(Citation: Microsoft Run Key)(Citation: MSDN Authentication Packages)(Citation: Microsoft TimeProvider)(Citation: Cylance Reg Persistence Sept 2013)(Citation: Linux Kernel Programming) These mechanisms may include automatically executing programs that are placed in specially designated directories or are referenced by repositories that store configuration information, such as the Windows Registry. An adversary may achieve the same goal by modifying or extending features of the kernel. Since some boot or logon autostart programs run with higher privileges, an adversary may leverage these to elevate privileges.

Name

Masquerading

ID

T1036

Description

Adversaries may attempt to manipulate features of their artifacts to make them appear legitimate or benign to users and/or security tools. Masquerading occurs when the name or location of an object, legitimate or malicious, is manipulated or abused for the sake of evading defenses and observation. This may include manipulating file metadata, tricking users into misidentifying the file type, and giving legitimate task or service names. Renaming abusable system utilities to evade security monitoring is also a form of [Masquerading](https://attack.mitre.org/techniques/T1036).(Citation: LOLBAS Main Site) Masquerading may also include the use of [Proxy](https://attack.mitre.org/techniques/T1090) or VPNs to disguise IP addresses, which can allow adversaries to blend in with normal network traffic and bypass conditional access policies or anti-abuse protections.

Name

Hide Artifacts

ID

T1564

Description

Adversaries may attempt to hide artifacts associated with their behaviors to evade detection. Operating systems may have features to hide various artifacts, such as important system files and administrative task execution, to avoid disrupting user work environments and prevent users from changing files or features on the system.

Adversaries may abuse these features to hide artifacts such as files, directories, user accounts, or other system activity to evade detection.(Citation: Sofacy Komplex Trojan) (Citation: Cybereason OSX Pirrit)(Citation: MalwareBytes ADS July 2015) Adversaries may also attempt to hide artifacts associated with malicious behavior by creating computing

regions that are isolated from common security instrumentation, such as through the use of virtualization technology.(Citation: Sophos Ragnar May 2020)

Name

Indicator Removal

ID

T1070

Description

Adversaries may delete or modify artifacts generated within systems to remove evidence of their presence or hinder defenses. Various artifacts may be created by an adversary or something that can be attributed to an adversary's actions. Typically these artifacts are used as defensive indicators related to monitored events, such as strings from downloaded files, logs that are generated from user actions, and other data analyzed by defenders. Location, format, and type of artifact (such as command or login history) are often specific to each platform. Removal of these indicators may interfere with event collection, reporting, or other processes used to detect intrusion activity. This may compromise the integrity of security solutions by causing notable events to go unreported. This activity may also impede forensic analysis and incident response, due to lack of sufficient data to determine what occurred.

Name

Software Discovery

ID

T1518

Description

Adversaries may attempt to get a listing of software and software versions that are installed on a system or in a cloud environment. Adversaries may use the information from [Software Discovery](https://attack.mitre.org/techniques/T1518) during automated

discovery to shape follow-on behaviors, including whether or not the adversary fully infects the target and/or attempts specific actions. Adversaries may attempt to enumerate software for a variety of reasons, such as figuring out what security measures are present or if the compromised system has a version of software that is vulnerable to [Exploitation for Privilege Escalation](https://attack.mitre.org/techniques/T1068).

Name

Domain Policy Modification

ID

T1484

Description

Adversaries may modify the configuration settings of a domain to evade defenses and/or escalate privileges in domain environments. Domains provide a centralized means of managing how computer resources (ex: computers, user accounts) can act, and interact with each other, on a network. The policy of the domain also includes configuration settings that may apply between domains in a multi-domain/forest environment. Modifications to domain settings may include altering domain Group Policy Objects (GPOs) or changing trust settings for domains, including federation trusts. With sufficient permissions, adversaries can modify domain policy settings. Since domain configuration settings control many of the interactions within the Active Directory (AD) environment, there are a great number of potential attacks that can stem from this abuse. Examples of such abuse include modifying GPOs to push a malicious [Scheduled Task](https:// attack.mitre.org/techniques/T1053/005) to computers throughout the domain environment(Citation: ADSecurity GPO Persistence 2016)(Citation: Wald0 Guide to GPOs) (Citation: Harmj0y Abusing GPO Permissions) or modifying domain trusts to include an adversary controlled domain where they can control access tokens that will subsequently be accepted by victim domain resources.(Citation: Microsoft - Customer Guidance on Recent Nation-State Cyber Attacks) Adversaries can also change configuration settings within the AD environment to implement a [Rogue Domain Controller](https:// attack.mitre.org/techniques/T1207). Adversaries may temporarily modify domain policy, carry out a malicious action(s), and then revert the change to remove suspicious indicators.

Name

Impair Defenses

ID

T1562

Description

Adversaries may maliciously modify components of a victim environment in order to hinder or disable defensive mechanisms. This not only involves impairing preventative defenses, such as firewalls and anti-virus, but also detection capabilities that defenders can use to audit activity and identify malicious behavior. This may also span both native defenses as well as supplemental capabilities installed by users and administrators. Adversaries may also impair routine operations that contribute to defensive hygiene, such as blocking users from logging out of a computer or stopping it from being shut down. These restrictions can further enable malicious operations as well as the continued propagation of incidents.(Citation: Emotet shutdown) Adversaries could also target event aggregation and analysis mechanisms, or otherwise disrupt these procedures by altering other system components.

Name

System Network Configuration Discovery

ID

T1016

Description

Adversaries may look for details about the network configuration and settings, such as IP and/or MAC addresses, of systems they access or through information discovery of remote systems. Several operating system administration utilities exist that can be used to gather this information. Examples include [Arp](https://attack.mitre.org/software/S0099), [ipconfig](https://attack.mitre.org/software/S0100)/[ifconfig](https://attack.mitre.org/software/S0101), [nbtstat](https://attack.mitre.org/software/S0102), and [route](https://attack.mitre.org/software/S0103). Adversaries may also leverage a [Network Device CLI] (https://attack.mitre.org/techniques/T1059/008) on network devices to gather information

about configurations and settings, such as IP addresses of configured interfaces and static/dynamic routes (e.g. `show ip route`, `show ip interface`).(Citation: US-CERT-TA18-106A)(Citation: Mandiant APT41 Global Intrusion) Adversaries may use the information from [System Network Configuration Discovery](https://attack.mitre.org/techniques/T1016) during automated discovery to shape follow-on behaviors, including determining certain access within the target network and what actions to do next.

Name

Server Software Component

ID

T1505

Description

Adversaries may abuse legitimate extensible development features of servers to establish persistent access to systems. Enterprise server applications may include features that allow developers to write and install software or scripts to extend the functionality of the main application. Adversaries may install malicious components to extend and abuse server applications.(Citation: volexity_Oday_sophos_FW)

Name

Archive Collected Data

ID

T1560

Description

An adversary may compress and/or encrypt data that is collected prior to exfiltration. Compressing the data can help to obfuscate the collected data and minimize the amount of data sent over the network. Encryption can be used to hide information that is being exfiltrated from detection or make exfiltration less conspicuous upon inspection by a

defender. Both compression and encryption are done prior to exfiltration, and can be performed using a utility, 3rd party library, or custom method.

Name

Exploit Public-Facing Application

ID

T1190

Description

Adversaries may attempt to exploit a weakness in an Internet-facing host or system to initially access a network. The weakness in the system can be a software bug, a temporary glitch, or a misconfiguration. Exploited applications are often websites/web servers, but can also include databases (like SQL), standard services (like SMB or SSH), network device administration and management protocols (like SNMP and Smart Install), and any other system with Internet accessible open sockets.(Citation: NVD CVE-2016-6662)(Citation: CIS Multiple SMB Vulnerabilities)(Citation: US-CERT TA18-106A Network Infrastructure Devices 2018)(Citation: Cisco Blog Legacy Device Attacks)(Citation: NVD CVE-2014-7169) Depending on the flaw being exploited this may also involve [Exploitation for Defense Evasion] (https://attack.mitre.org/techniques/T1211). If an application is hosted on cloud-based infrastructure and/or is containerized, then exploiting it may lead to compromise of the underlying instance or container. This can allow an adversary a path to access the cloud or container APIs, exploit container host access via [Escape to Host](https://attack.mitre.org/ techniques/T1611), or take advantage of weak identity and access management policies. Adversaries may also exploit edge network infrastructure and related appliances, specifically targeting devices that do not support robust host-based defenses.(Citation: Mandiant Fortinet Zero Day)(Citation: Wired Russia Cyberwar) For websites and databases, the OWASP top 10 and CWE top 25 highlight the most common web-based vulnerabilities. (Citation: OWASP Top 10)(Citation: CWE top 25)

Name

Ingress Tool Transfer

ID

T1105

Description

Adversaries may transfer tools or other files from an external system into a compromised environment. Tools or files may be copied from an external adversary-controlled system to the victim network through the command and control channel or through alternate protocols such as [ftp](https://attack.mitre.org/software/S0095). Once present, adversaries may also transfer/spread tools between victim devices within a compromised environment (i.e. [Lateral Tool Transfer](https://attack.mitre.org/techniques/T1570)). On Windows, adversaries may use various utilities to download tools, such as `copy`, `finger`, [certutil] (https://attack.mitre.org/software/S0160), and [PowerShell](https://attack.mitre.org/ techniques/T1059/001) commands such as `IEX(New-Object Net.WebClient).downloadString() and Invoke-WebRequest. On Linux and macOS systems, a variety of utilities also exist, such as `curl`, `scp`, `sftp`, `tftp`, `rsync`, `finger`, and `wget`. (Citation: t1105_lolbas) Adversaries may also abuse installers and package managers, such as `yum` or `winget`, to download tools to victim hosts. Files can also be transferred using various [Web Service](https://attack.mitre.org/techniques/T1102)s as well as native or otherwise present tools on the victim system.(Citation: PTSecurity Cobalt Dec 2016) In some cases, adversaries may be able to leverage services that sync between a web-based and an on-premises client, such as Dropbox or OneDrive, to transfer files onto victim systems. For example, by compromising a cloud account and logging into the service's web portal, an adversary may be able to trigger an automatic syncing process that transfers the file onto the victim's machine.(Citation: Dropbox Malware Sync)

Name

Account Access Removal

ID

T1531

Description

Adversaries may interrupt availability of system and network resources by inhibiting access to accounts utilized by legitimate users. Accounts may be deleted, locked, or manipulated (ex: changed credentials) to remove access to accounts. Adversaries may also subsequently log off and/or perform a [System Shutdown/Reboot](https://

attack.mitre.org/techniques/T1529) to set malicious changes into place.(Citation: CarbonBlack LockerGoga 2019)(Citation: Unit42 LockerGoga 2019) In Windows, [Net](https://attack.mitre.org/software/S0039) utility, `Set-LocalUser` and `Set-ADAccountPassword` [PowerShell](https://attack.mitre.org/techniques/T1059/001) cmdlets may be used by adversaries to modify user accounts. In Linux, the `passwd` utility may be used to change passwords. Accounts could also be disabled by Group Policy. Adversaries who use ransomware or similar attacks may first perform this and other Impact behaviors, such as [Data Destruction](https://attack.mitre.org/techniques/T1485) and [Defacement](https://attack.mitre.org/techniques/T1491), in order to impede incident response/recovery before completing the [Data Encrypted for Impact](https://attack.mitre.org/techniques/T1486) objective.

Name

Network Service Discovery

ID

T1046

Description

Adversaries may attempt to get a listing of services running on remote hosts and local network infrastructure devices, including those that may be vulnerable to remote software exploitation. Common methods to acquire this information include port and/or vulnerability scans using tools that are brought onto a system.(Citation: CISA AR21-126A FIVEHANDS May 2021) Within cloud environments, adversaries may attempt to discover services running on other cloud hosts. Additionally, if the cloud environment is connected to a on-premises environment, adversaries may be able to identify services running on non-cloud systems as well. Within macOS environments, adversaries may use the native Bonjour application to discover services running on other macOS hosts within a network. The Bonjour mDNSResponder daemon automatically registers and advertises a host's registered services on the network. For example, adversaries can use a mDNS query (such as `dns-sd -B _ssh._tcp .`) to find other systems broadcasting the ssh service.(Citation: apple doco bonjour description)(Citation: macOS APT Activity Bradley)

Name

Command and Scripting Interpreter

ID

T1059

Description

Adversaries may abuse command and script interpreters to execute commands, scripts, or binaries. These interfaces and languages provide ways of interacting with computer systems and are a common feature across many different platforms. Most systems come with some built-in command-line interface and scripting capabilities, for example, macOS and Linux distributions include some flavor of [Unix Shell](https://attack.mitre.org/ techniques/T1059/004) while Windows installations include the [Windows Command Shell] (https://attack.mitre.org/techniques/T1059/003) and [PowerShell](https://attack.mitre.org/ techniques/T1059/001). There are also cross-platform interpreters such as [Python] (https://attack.mitre.org/techniques/T1059/006), as well as those commonly associated with client applications such as [JavaScript](https://attack.mitre.org/techniques/ T1059/007) and [Visual Basic](https://attack.mitre.org/techniques/T1059/005). Adversaries may abuse these technologies in various ways as a means of executing arbitrary commands. Commands and scripts can be embedded in [Initial Access](https:// attack.mitre.org/tactics/TA0001) payloads delivered to victims as lure documents or as secondary payloads downloaded from an existing C2. Adversaries may also execute commands through interactive terminals/shells, as well as utilize various [Remote Services](https://attack.mitre.org/techniques/T1021) in order to achieve remote Execution. (Citation: Powershell Remote Commands)(Citation: Cisco IOS Software Integrity Assurance -Command History)(Citation: Remote Shell Execution in Python)

Name

Account Discovery

ID

T1087

Description

Adversaries may attempt to get a listing of valid accounts, usernames, or email addresses on a system or within a compromised environment. This information can help adversaries determine which accounts exist, which can aid in follow-on behavior such as brute-

forcing, spear-phishing attacks, or account takeovers (e.g., [Valid Accounts](https://attack.mitre.org/techniques/T1078)). Adversaries may use several methods to enumerate accounts, including abuse of existing tools, built-in commands, and potential misconfigurations that leak account names and roles or permissions in the targeted environment. For examples, cloud environments typically provide easily accessible interfaces to obtain user lists. On hosts, adversaries can use default [PowerShell](https://attack.mitre.org/techniques/T1059/001) and other command line functionality to identify accounts. Information about email addresses and accounts may also be extracted by searching an infected system's files.

Name

Firmware Corruption

ID

T1495

Description

Adversaries may overwrite or corrupt the flash memory contents of system BIOS or other firmware in devices attached to a system in order to render them inoperable or unable to boot, thus denying the availability to use the devices and/or the system.(Citation: Symantec Chernobyl W95.CIH) Firmware is software that is loaded and executed from non-volatile memory on hardware devices in order to initialize and manage device functionality. These devices may include the motherboard, hard drive, or video cards. In general, adversaries may manipulate, overwrite, or corrupt firmware in order to deny the use of the system or devices. For example, corruption of firmware responsible for loading the operating system for network devices may render the network devices inoperable. (Citation: dhs_threat_to_net_devices)(Citation: cisa_malware_orgs_ukraine) Depending on the device, this attack may also result in [Data Destruction](https://attack.mitre.org/techniques/T1485).

Name

Application Layer Protocol

ID

T1071

Description

Adversaries may communicate using OSI application layer protocols to avoid detection/ network filtering by blending in with existing traffic. Commands to the remote system, and often the results of those commands, will be embedded within the protocol traffic between the client and server. Adversaries may utilize many different protocols, including those used for web browsing, transferring files, electronic mail, or DNS. For connections that occur internally within an enclave (such as those between a proxy or pivot node and other nodes), commonly used protocols are SMB, SSH, or RDP.

Name

Deobfuscate/Decode Files or Information

ID

T1140

Description

Adversaries may use [Obfuscated Files or Information](https://attack.mitre.org/techniques/T1027) to hide artifacts of an intrusion from analysis. They may require separate mechanisms to decode or deobfuscate that information depending on how they intend to use it. Methods for doing that include built-in functionality of malware or by using utilities present on the system. One such example is the use of [certutil](https://attack.mitre.org/software/S0160) to decode a remote access tool portable executable file that has been hidden inside a certificate file.(Citation: Malwarebytes Targeted Attack against Saudi Arabia) Another example is using the Windows `copy /b` command to reassemble binary fragments into a malicious payload.(Citation: Carbon Black Obfuscation Sept 2016) Sometimes a user's action may be required to open it for deobfuscation or decryption as part of [User Execution](https://attack.mitre.org/techniques/T1204). The user may also be required to input a password to open a password protected compressed/encrypted file that was provided by the adversary. (Citation: Volexity PowerDuke November 2016)

Name

File and Directory Discovery

ID

T1083

Description

Adversaries may enumerate files and directories or may search in specific locations of a host or network share for certain information within a file system. Adversaries may use the information from [File and Directory Discovery](https://attack.mitre.org/techniques/T1083) during automated discovery to shape follow-on behaviors, including whether or not the adversary fully infects the target and/or attempts specific actions. Many command shell utilities can be used to obtain this information. Examples include `dir`, `tree`, `ls`, `find`, and `locate`.(Citation: Windows Commands JPCERT) Custom tools may also be used to gather file and directory information and interact with the [Native API](https://attack.mitre.org/techniques/T106). Adversaries may also leverage a [Network Device CLI] (https://attack.mitre.org/techniques/T1059/008) on network devices to gather file and directory information (e.g. `dir`, `show flash`, and/or `nvram`).(Citation: US-CERT-TA18-106A)

Name

System Information Discovery

ID

T1082

Description

An adversary may attempt to get detailed information about the operating system and hardware, including version, patches, hotfixes, service packs, and architecture. Adversaries may use the information from [System Information Discovery](https://attack.mitre.org/techniques/T1082) during automated discovery to shape follow-on behaviors, including whether or not the adversary fully infects the target and/or attempts specific actions. Tools such as [Systeminfo](https://attack.mitre.org/software/S0096) can be used to gather detailed system information. If running with privileged access, a breakdown of system data can be gathered through the `systemsetup` configuration tool on macOS. As an example,

adversaries with user-level access can execute the `df -aH` command to obtain currently mounted disks and associated freely available space. Adversaries may also leverage a [Network Device CLI](https://attack.mitre.org/techniques/T1059/008) on network devices to gather detailed system information (e.g. `show version`).(Citation: US-CERT-TA18-106A) [System Information Discovery](https://attack.mitre.org/techniques/T1082) combined with information gathered from other forms of discovery and reconnaissance can drive payload development and concealment.(Citation: OSX.FairyTale)(Citation: 20 macOS Common Tools and Techniques) Infrastructure as a Service (IaaS) cloud providers such as AWS, GCP, and Azure allow access to instance and virtual machine information via APIs. Successful authenticated API calls can return data such as the operating system platform and status of a particular instance or the model view of a virtual machine.(Citation: Amazon Describe Instance)(Citation: Google Instances Resource)(Citation: Microsoft Virutal Machine API)

Name

Domain Trust Discovery

ID

T1482

Description

Adversaries may attempt to gather information on domain trust relationships that may be used to identify lateral movement opportunities in Windows multi-domain/forest environments. Domain trusts provide a mechanism for a domain to allow access to resources based on the authentication procedures of another domain.(Citation: Microsoft Trusts) Domain trusts allow the users of the trusted domain to access resources in the trusting domain. The information discovered may help the adversary conduct [SID-History Injection](https://attack.mitre.org/techniques/T1134/005), [Pass the Ticket](https://attack.mitre.org/techniques/T1550/003), and [Kerberoasting](https://attack.mitre.org/techniques/T1558/003).(Citation: AdSecurity Forging Trust Tickets)(Citation: Harmj0y Domain Trusts) Domain trusts can be enumerated using the `DSEnumerateDomainTrusts()` Win32 API call, .NET methods, and LDAP.(Citation: Harmj0y Domain Trusts) The Windows utility [Nltest](https://attack.mitre.org/software/S0359) is known to be used by adversaries to enumerate domain trusts.(Citation: Microsoft Operation Wilysupply)

Sector

Name

Government and administrations

Description

Civilian government institutions and administrations of the executive and legislative branches. The diplomatic and judicial branches are not included.

21 Sector

Indicator

Name

a3acb9f79647f813671c1a21097a51836b0b95397ebc9cd178bc806e1773c864

Description

ConventionEngine_Term_Users SHA256 of b6818d2d5cbd902ce23461f24fc47e24937250e6

Pattern Type

stix

Pattern

[file:hashes.'SHA-256' = 'a3acb9f79647f813671c1a21097a51836b0b95397ebc9cd178bc806e1773c864']

22 Indicator

StixFile

Value

a3acb9f79647f813671c1a21097a51836b0b95397ebc9cd178bc806e1773c864

23 StixFile

External References

- https://otx.alienvault.com/pulse/656f3c476dc909e3c448b786
- https://www.cisa.gov/news-events/cybersecurity-advisories/aa23-339a

24 External References