

July 2023

REFERENCE IMPLEMENTATION REVISION 2 FOR REPRESENTATION OF CYBER ADVERSARY BEHAVIOR IN STRUCTURED THREAT INFORMATION EXCHANGE (STIX) FORMAT

Prepared by:

The Johns Hopkins University Applied Physics Laboratory 11100 Johns Hopkins Rd. Laurel, Maryland 20723-6099

Authors:

Charles Frick, <u>Charles.Frick@jhuapl.edu</u> Tim Zhan Kurt Karolenko

APL Research Team

- Emma Lubes
- Jason O'Connor
- Ali Shahegh



Prepared for: The Cybersecurity and Infrastructure Security Agency

Distribution Statement A. Approved for public release: distribution unlimited.

Disclaimer: The views and conclusions contained in this document are those of the author and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Department of Homeland Security / Cybersecurity and Infrastructure Security Agency.





CONTENTS

1.	Introduction	
2.	Behavior sharing research	
	2.1 Motivation for the Research	
	2.2 Research Environment	4
	2.3 Initial Behavior Set Reference Implementation	
3.	Next steps	29
4.	Acknowledgement	29
5.	Conclusion	29
6.	Appendix A: Acronymns	30
7.	Appendix B: Complete behavior set STIX bundle	3





FIGURES

Figure 1: Reference implementation research environment	5
Figure 2: Reference implementation emulated attack scenario	7
Figure 3: Visualization of reference implementation behavior set STIX bundle	9
Figure 4 Neo4J visualization of reference implementation data	10
Figure 5 Neo4J visualization of core reference implementation data elements	11
Figure 6: Simplified example of adversary behaviors	21
Figure 7: Conceptual process for detection correlation logic	25
Figure 8 Shared playbook for system quarantine	29





1. INTRODUCTION

The Johns Hopkins University Applied Physics Laboratory (APL), under the sponsorship of the Cybersecurity and Infrastructure Security Agency (CISA), seeks to dramatically change the timeline and effectiveness of cyber defense via integration, automation, and information sharing. Towards this goal, Johns Hopkins APL is providing a reference implementation for our research into machine readable objects, in Structured Threat Information eXchange (STIX)¹ format, to represent cyber adversary behaviors on a network. This report provides an overview of the research methodology as well as a guide for understanding the content and concepts within the reference implementation object.

2. BEHAVIOR SHARING RESEARCH

The key focus of APL's adversary behavior research is the generation of machine-readable objects to represent adversary behavior on a target network. This is an evolution of previous APL research conducted for CISA and as part of the Integrated Adaptive Cyber Defense (IACD)² framework.

Previous research focused on designing the proper format to hold adversary behavior. The use of custom objects within STIX standard version 2.1 was the format chosen based on those efforts. For this reference implementation, APL research focused on the creation of the content for a robust machine-readable STIX bundle that could be shared throughout a community. This design allows both human analysts and automation to use the shared information to detect an adversary's observed behavior within the victim network.

2.1 Motivation for the Research

Previous APL work under the IACD program identified a significant gap in Cyber Threat Intelligence (CTI) sharing when that sharing is solely focused on Indicators of Compromise (IOCs). IOCs by their very nature have a limited time window of being actionable towards network defense. While significant progress with Security Orchestration, Automation and Response (SOAR) has been achieved to take action on IOCs within a viable timeline for network defense, there remains a clear need for sharing data that can help a community of network defenders proactively defend against advanced attacks.

2.2 Research Environment

APL maintains a robust virtualization testbed environment to support our research and experimentation efforts. Figure 1 provides a summary of how a dedicated enclave of that environment was configured for the development of the reference implementation.

¹ https://oasis-open.github.io/cti-documentation/

² https://iacdautomate.org





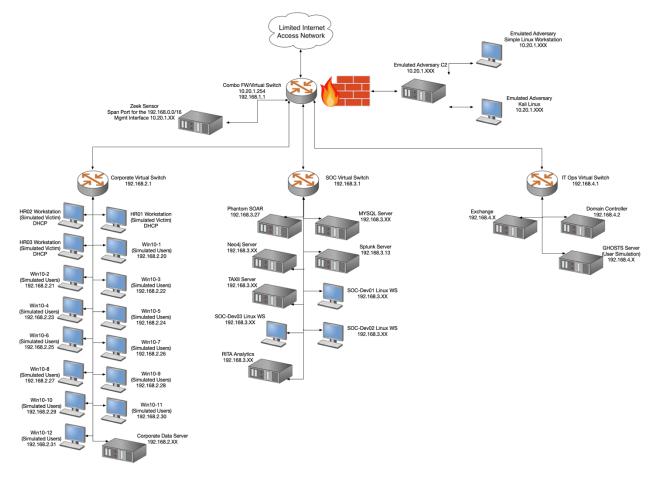


Figure 1: Reference implementation research environment

The research environment is sectioned into four main enclaves. The following description of the enclaves provides an overview of the tools used in creation of the reference implementation but is not provided as any form of endorsement for any singular technology or open-source project:

- An emulated adversary enclave implementing common threat emulation tools such as Cobalt Strike³
- An emulated corporate enclave containing:
 - Windows workstations automated with the Carnegie Mellon University (CMU) GHOSTS⁴ agent to create benign user activity within the network
 - Splunk⁵ Security Information and Event Management (SIEM) forwarders for SYSMON⁶ and Windows event logs
 - A file server to contain emulated sensitive information that would be the adversary's target for data exfiltration

³ https://www.cobaltstrike.com

⁴ https://github.com/cmu-sei/GHOSTS

⁵ https://www.splunk.com

⁶ https://docs.microsoft.com/en-us/sysinternals/downloads/sysmon





- An emulated Network Operations Center enclave containing:
 - Windows domain controller for Active Directory
 - o Exchange email server
 - o Command and control for the CMU GHOSTS agents
- An emulated Security Operations Center enclave containing:
 - o A Zeek⁷ network sensor to analyze traffic
 - A Trusted Automated eXchange of Indicator Information (TAXII) server for the transmission of any shared STIX objects
 - o A MySQL⁸ database server for holding STIX data internally to the network
 - This was done to simulate a very basic Threat Intel Platform (TIP) capability since the research for the reference implementation did not require all the features of a TIP
 - A Real Intelligence Threat Analytics (RITA)⁹ server for generation of beaconing alerts from the Zeek analytics
 - A Splunk SIEM for detecting adversary activity
 - Used in research analysis to develop a shared behavior object
 - Also used from the point of view as a recipient who would receive a bundle and translate that data into analytics for a SIEM
 - A Splunk SOAR platform for automating SOC activities
 - While not heavily used in the reference implementation, work was done to update and use SOAR to support future research on automating the behavior development process as well as executing future correlation and response actions

2.3 Initial Behavior Set Reference Implementation

APL's research focuses on creating STIX "behavior-set" bundles. These bundles represent sequences of observed adversary behaviors within a network that are not dependent on traditional IOCs (file hash, URL, IP address, etc.). Instead, the bundles include detection analytics for individual behaviors as well as information on how to correlate behaviors to better detect and prioritize a sequence of observed adversary behaviors. Additionally, this STIX bundle also provides information on observables used to generate the behaviors, detector descriptions, data components/sources, courses of actions to take once a sequence is detected, and shareable playbooks to achieve the shared courses of action.

Bundles such as the reference implementation are intended to augment a larger set of CTI within the STIX standard. As behaviors represent sequences of procedures conducted by an adversary, they are inherently linked to adversary tactics and techniques, represented within the MITRE ATT&CK®10 framework. The goal of the behavior sets and detection bundles is to provide more actionable detection techniques than those present in the ATT&CK description. Achieving this goal will make it easier for community and vendors to rapidly add detections for advanced

⁷ https://github.com/zeek/zeek

⁸ https://www.mysql.com

⁹ https://github.com/activecm/rita

¹⁰ https://attack.mitre.org





attacks that could assist with defense against multiple campaigns by a cyber adversary or set of adversaries.

A summary of the overall goals for the reference implementation research follows:

- Emulate threat behaviors
- Identify and create behavior objects
- Correlate behavior objects into behavior sets
- Create detection objects for behavior sets
- Develop a STIX bundle to include:
 - Behavior Set
 - o Observables
 - o Detections
 - o Detectors
 - o Detection Groups for correlation
 - o Courses of Action
 - Playbooks
- Store and share the STIX bundle

2.3.1 Adversary Scenario

To properly capture a realistic set of adversary behaviors, APL required a representative sample adversary attack. Figure 2 provides a visual representation of the sample attack that was based on the "APT 37/Reaper" campaign.

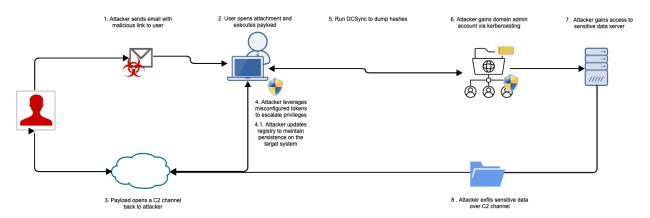


Figure 2: Reference implementation emulated attack scenario

The overall steps in this attack include:

- 1. Attacker sends an email to the target organization with a malicious link.
- 2. The user opens the attachment and executes a malicious office macro payload.

¹¹ https://www2.fireeye.com/rs/848-DID-242/images/rpt APT37.pdf





- The details of the file are traditionally shared as IOCs, but those details are often modified rapidly by the attacker, reducing the effectiveness of the IOC in enabling network defense across a community.
- 3. The payload establishes a command and control (C2) channel to adversary infrastructure.
 - The domains and/or IP addresses of the C2 server are traditionally shared as IOCs, but those details are often modified rapidly by the attacker, reducing the effectiveness of the IOC in enabling network defense across a community.
- 4. The attacker escalates privileges on the initial victim machine.
 - The attacker leverages misconfigured tokens to escalate privileges.
 - The attacker then updates the initial victim machine registry to maintain persistence.
- 5. The attacker uses the "DCSync" capability to retrieve password hashes from the target network's domain controller.
- 6. The attacker then uses the "kerberoasting" technique to gain access as a domain administrator account.
- 7. The attacker uses this compromised administrator account to gain access to a sensitive data server.
- 8. The attacker then exfiltrates sensitive data via the established C2 channel.

2.3.2 Behavior Set STIX Bundle

The full text of the reference implementation STIX bundle for representing an adversary set of behaviors is provided in <u>Appendix B</u>. Figure 3 provides a visualization of the bundle via the STIX visualizer from the OASIS standards group.¹⁴

Due to the complex set of information and relationships found within the reference implementation, the default view from the STIX visualizer may be difficult to read. To address this challenge, the IOB Sub-Project released an open source python script to translate this information into a Neo4J graph database. Figure 4 provides a visualization of all the included data within the reference implementation using the Neo4J browser and Figure 5 provides a visualization of the core elements within the reference implementation. It is important to note that the colors used for icons in the Neo4J visualization were chosen to improve readability in this specific documentation and are not the official colors used in the icon set provided by the OASIS standards body.

¹² https://attack.mitre.org/techniques/T1003/006/

¹³ https://attack.mitre.org/techniques/T1558/003/

¹⁴ https://oasis-open.github.io/cti-stix-visualization/

¹⁵ https://github.com/opencybersecurityalliance/oca-iob/tree/main/STIX2NEO4J%20Converter





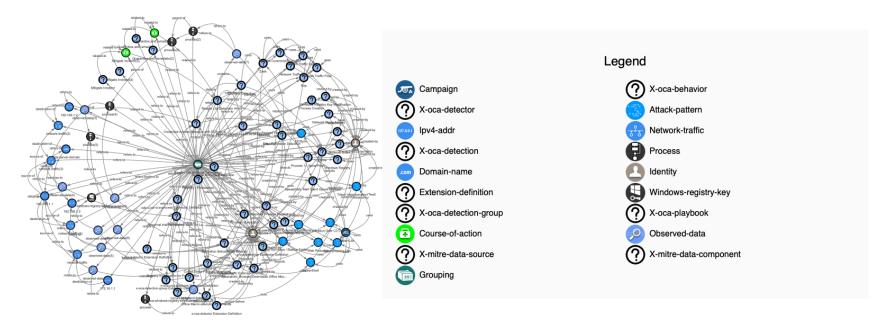


Figure 3: Visualization of reference implementation behavior set STIX bundle





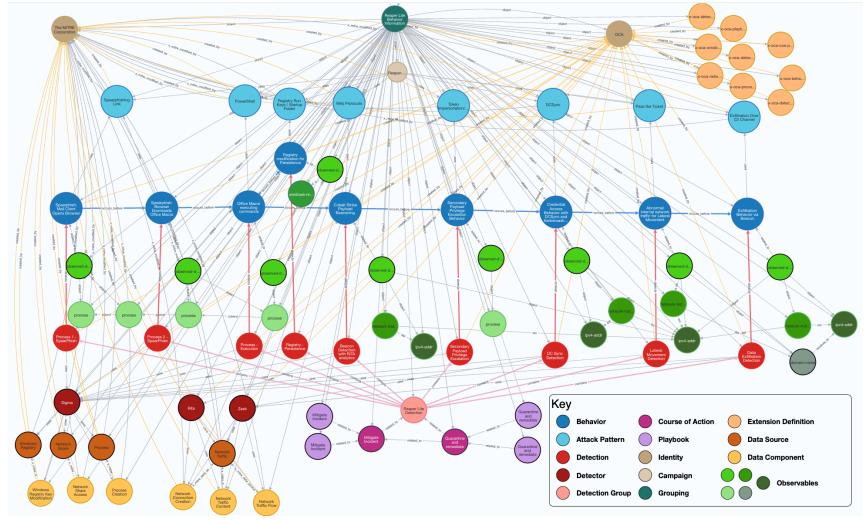


Figure 4 Neo4J visualization of reference implementation data





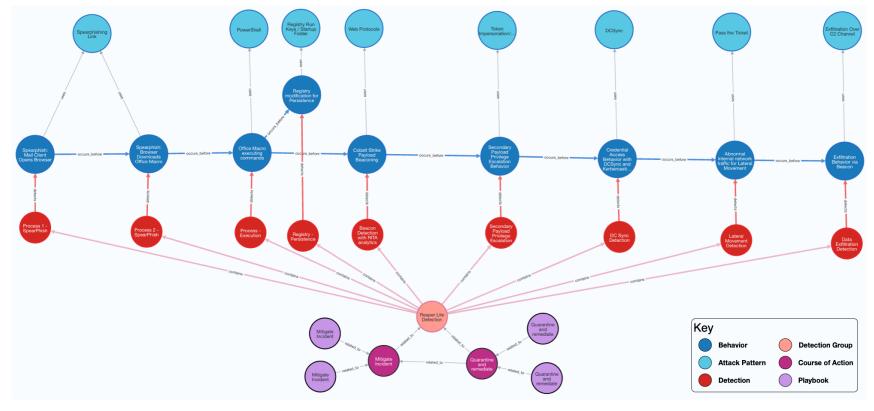


Figure 5 Neo4J visualization of core reference implementation data elements





This reference implementation bundle contains several custom SDOs as well as several custom SCOs. The standard SDO of a "grouping" object was used to represent the observed set of behaviors. The following descriptions of the custom objects provides a key for reading the diagram in Figure 4 with respect to the custom objects:

- Behavior SDO
 - O Icon: Exfittration Behavior value Beecon
 - O Description: Behavior SDOs represent the observed adversary behaviors within a particular campaign. These consist of a sequence of actions characterized by multiple techniques (and sub-techniques) in pursuit of multiple tactical goals. As such, these objects may contain relationships to STIX Attack-Pattern SDOs that are traditionally used to represent entries in the MITRE ATT&CK framework. These objects exist to provide more actionable data for detection and response than what is currently found in the ATT&CK information.
 - o Fields within the object:
 - STIX type
 - STIX specification version
 - STIX ID
 - Created by reference
 - Created date
 - Description field
 - Behavior class
 - Modification date
 - Name
 - Tactic
 - Technique
 - First seen date
 - Platforms affected by the behavior
 - Extensions
- Detection SDO



- o Icon:
- Description: Detection SDOs provide information on how to detect a particular behavior observed from a campaign. These detections are presented as analytics referencing the SCOs related to the behavior object. The key distinction is that the analytics are designed to not be IOC specific so that they can relate to multiple occurrences of the behavior. It is possible to have more than a single detection for a behavior. The guidance on how to correlate these detections within a set of behaviors is defined in the Detection Group SDO.
- o Fields within the object:
 - STIX type
 - STIX specification version
 - STIX ID
 - Created by reference





- Created date
- Modification date
- Name
- Analytic for detection
- Data sources to support analytic
- Detector SDO



- Description: The detector SDO provides information on the capabilities used to create a detection. This information is shared so that CTI recipients and their automation can know what capabilities are needed to use an analytic shared within a detection object. This information can be used for detectors that may be more dynamic in nature.
- o Fields within the object:
 - STIX type
 - STIX specification version
 - STIX ID
 - Created by reference
 - Created date
 - Modification date
 - Valid until date
 - Name
 - Common Platform Enumeration for detector (when applicable)
 - Description field
 - Detection types applicable to this detector
 - Detection data categories that support this detector
 - Extensions used within the object
 - Detector product
 - Detector product URL (when applicable)
 - Detector product version
 - Detector vendor
 - Detector vendor URL (when applicable)
 - Data sources to support detector
- Data Source SDO



- o Icon:
- Description: To provide a more complete description of the data needed to support detectors/detection, the reference implementation includes examples using the "x-mitre-data-source" SDO from MITRE ATT&CK.
- o Fields within the object:
 - STIX type
 - STIX specification version
 - STIX ID
 - Created by reference
 - Created date
 - Modification date





- Name
- **Description Field**
- External references
- Object marking
- MITRE ATT&CK version
- MITRE collection layers
- MITRE domains
- Data Component SDO



- Icon:
- Description: To provide a more complete description of the data needed to support detectors/detection, the reference implementation includes examples using the "x-mitre-data-component" SDO from MITRE ATT&CK.
- Fields within the object:
 - STIX type
 - STIX specification version
 - STIX ID
 - Created by reference
 - Created date
 - Modification date
 - Name
 - Object marking
 - MITRE ATT&CK version
 - Data Source reference
 - MITRE domains
- **Detection Group SDO**



- Icon:
- Description: The Detection Group SDO is intended to provide the guidance on how to correlate the multiple detections within a grouping of behavior SDOs. As of Spiral 26, APL is still refining the logic and required metadata for strong correlations but the version provided in the Spiral 26 reference implementation conveys the current status of the object.
- Fields within the object:
 - STIX type
 - STIX ID
 - STIX specification version
 - Created date
 - Modification date
 - Name
 - Description field
 - Correlation workflows describing the correlation procedure
 - List of detection object STIX IDs to use for correlation
- Course of Action SDO
 - o Icon:





- Description: Once a sequence of behaviors from a Detection Group has been identified, the reference implementation includes Course of Action SDOs share recommended courses of action to take. This SDO has been extended to support the inclusion of playbooks as recommended by the CACAO project. The relevant playbooks are shared as independent SDOs as there can be a one-to-many relationship between a course of action and relevant playbooks.
- Fields within the object:
 - STIX type
 - STIX ID
 - STIX specification version
 - Created date
 - Modification date
 - Name
 - Description field
 - Extension
- Playbook SDO



- o Icon:
- Description: To provide additional context to shared courses of action, the reference implementation includes a playbook SDO to outline the steps required for implementing the course of action. This object structure was designed by the suggestions from the CACAO project.
- o Fields within the object:
 - STIX type
 - STIX ID
 - STIX specification version
 - Created date
 - Modification date
 - Name
 - Description field
 - Playbook abstraction
 - Playbook bin (base64 representation of playbook)
 - Playbook creator
 - Playbook format
 - Playbook type
 - Playbook revocation status
- Identity SDO



- o Icon:
- Description: The Identity SDO represents entities relevant to the CTI held in the bundle. The bundle contains an Identity SDO for MITRE Corporation, which produced the Attack-Pattern SDOs. The bundle also contains an Identity SDO for the targeted organization.
- o Fields within the object:
 - STIX type
 - STIX ID





- STIX specification version
- Created date
- Modification date
- Name
- Grouping SDO



- o Icon:
- Description: The Grouping SDO is used to associate related STIX objects together. A Grouping SDO is used to group the Behavior SDOs observed during the attack.
- o Fields within the object:
 - STIX type
 - STIX ID
 - STIX specification version
 - Created date
 - Modification date
 - Context on how the objects within the Grouping are related
 - References to objects within grouping
- Attack-Pattern SDO



- o Icon:
- Description: The Attack-Pattern SDO describes adversary tactics, techniques, and procedures (TTPs). The Attack-Pattern SDOs in the bundle have been constructed by MITRE and include custom fields.
- o Fields within the object:
 - STIX type
 - STIX ID
 - STIX specification version
 - Name
 - Description field
 - Created by
 - Created date
 - Modification date
 - Kill chain phases
 - Object marking references
 - External references
 - MITRE custom fields
 - Data sources
 - MITRE version
 - Platforms
 - Flag to determine if the instance is a sub technique
 - Contributors
 - MITRE detection
 - MITRE ATT&CK specification version
 - Domains





- Modified by Identity reference
- Campaign SDO



- o Description: The Campaign SDO groups adversarial activity against specific targets over a period of time. The object is used to group the Attack-Pattern SDOs involved in the attack. In the bundle, the Campaign SDO also refers to the Grouping SDO containing the Behavior SDOs.
- Fields within the object:
 - STIX type
 - STIX ID
 - STIX specification version
 - Created date
 - Modification date
 - Name
 - Description field
 - First seen date
 - Last seen date
- Observed Data SDO



- o Description: To provide support for those wishing to research detections through STIX patterning, the reference implementation includes the Observed Data SDO to be better compliant with the STIX standard
- Fields within the object:
 - STIX type
 - STIX ID
 - STIX specification version
 - Created date
 - Modification date
 - Name
 - Object references
- **Process SCO**



- o Icon:
- o Description: Process SCOs are used for observed sequences of processes executed within an observed behavior. These is often low-level information found within target network log sources such as SYSMON.¹⁶ As opposed to traditional IoCs that may represent the name of a particular malicious process, these SCOs capture common processes within multiple target environments to describe when one process is creating a new process. For example, this is used to capture when something like office applications spawn new processes such as PowerShell or Windows Command Line via a malicious macro. The sequence of Process SCOs

¹⁶ https://docs.microsoft.com/en-us/sysinternals/downloads/sysmon





is key to developing the detection object for the behavior of new system process creation.

- o Fields within the object:
 - STIX type
 - STIX ID
 - STIX specification version
 - Object marking refs
 - Granular markings
 - Flag to determine whether the referenced information in the process is "defanged"
 - Flag to determine if the SCO is hidden
 - Process ID (PID)
 - Created date
 - Current Working Directory (CWD)
 - Command line information for the process when available
 - Opened connection references
 - Creator user reference
 - Object reference to executable binary executed as the process image
 - Object reference to parent process
 - Object references to child processes
 - Extensions applied to the SCO
 - Action
 - User
 - Source
 - Creator process name: list of process names or patterns that may spawn the current process
 - New process name: list of process names or patterns that the creator processes may create
 - Windows event code
- Registry SCO
 - O Icon: windows-re
 - O Description: The registry key SCO provides details for adversary behaviors that modify a particular registry key. It is intended to help restrict behavior alerts to adversary campaigns that modify a specify Windows Registry key. By linking it to the processes created within a chain of Process SCOs, detection is improved. The goal is to share the correlating fact that the process created by a chain of process SCOs is the same one that calls to the registry to make this change. This is different than sharing the name of a specific process from a single incident that calls "regedit.exe" as it provides the path to identify new processes in new
 - o Fields within the object:

campaigns.

- STIX type
- STIX ID
- STIX specification version





- Registry key referenced
- Registry key values
- Extensions applied to SCO
 - Action performed on the key
 - New value of the key
 - ID of process that acted on the key
 - Name of process that acted on the key
- IPv4 Address SCO
 - O Icon: ipv4-addr
 - o Description: The IPv4 Address SCO represents an IPv4 address.
 - o Fields within the object:
 - STIX type
 - STIX ID
 - STIX specification version
 - Value
- Network Traffic SCO



- o Icon:
- O Description: The Network Traffic SCO represents network traffic between a source and destination.
- o Fields within the object:
 - STIX type
 - STIX ID
 - STIX specification version
 - Source IP reference
 - Destination IP reference
 - Protocols
 - Extensions applied to SCO
 - Number of connections
 - Real Intelligence Threat Analysis (RITA)¹⁷ score
- Domain Name SCO



- o Icon: \
- Description: The Domain Name SCO provides observable information of a domain utilized by threat activity
- o Fields within the object:
 - STIX type
 - STIX ID
 - STIX specification version
 - Domain Value
- Extension Definition SDO

¹⁷ https://github.com/activecm/rita







- Description: When custom extensions are added to an SDO, the Extension Definition SDO provides a reference to the JSON schema used to represent the additional data.
- Fields within the object:
 - STIX type
 - STIX specification version
 - STIX ID
 - Created by reference
 - Created date
 - Modification date
 - Description field
 - Name
 - Link to extension schema
 - Version
 - List of extension types

2.3.3 Detailed Example for a Subset of the Behavior Bundle

A detailed subset of the first three observed behaviors from the reference implementation scenario shown in Figure 4 follows to better clarify the concepts and capabilities present within the behavior bundle. This example is intended to demonstrate how information in the shared behavior bundle can aid in detecting the sequence of attacker activities represented in Figure 6.





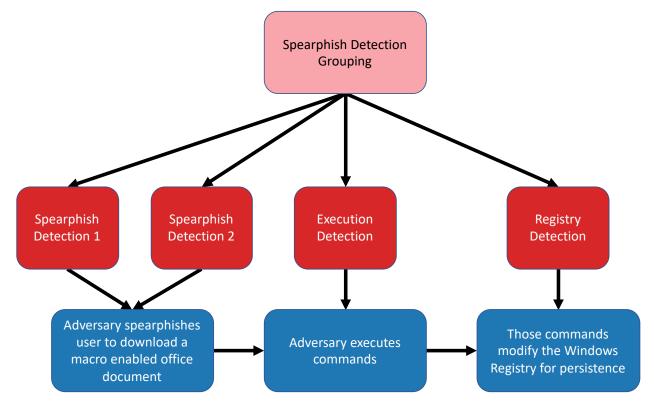


Figure 6: Simplified example of adversary behaviors

The first behavior is intended to represent the observable characteristics within the victim's network when a specific machine's email client (e.g., MS Mail, Outlook, Thunderbird) spawns a process to open a web browser (e.g., Chrome, Firefox, Edge) and download a macro-enabled office document (e.g., *.docm, *.pptm, *.xlsm). The specific types of processes observed in the behavior are common within multiple organizations using similar software. These processes can be commonly recorded via standard Microsoft Windows Log types, such as Windows Event Log and SYSMON. The behavior object also contains a link to a pair of analytics to determine this type of behavior. APL chose the Sigma¹⁸ common analytic format for log analysis to represent these connected analytics.

For the detection the email client opening a web browser, the following Sigma rule is provided:

- - -

date: 2021/06/07
detection:

selection:

EventCode: '4688'

Creator_Process_Name | contains:

- outlook
- thunderbird
- mail

New_Process_Name|contains:

¹⁸ https://github.com/SigmaHQ/sigma





```
- edge
    - chrome
    - firefox
  condition: selection
level: high
author: demo
description: Detects Office macro opening from browser.
id: spearphishing
falsepositives:
- Low
title: Spearphishing with Link
logsource:
  index: main
  product: windows
  category: process_event
status: experimental
tags:
attack.initial_access
- attack.t1566.002
```

For the detection of the web browser downloading a macro-enabled office document, the following Sigma rule is provided:

```
date: 2021/06/07
detection:
  selection:
    Process_Command_Line | contains:
    - docm
    - xlsm
    - pptm
    EventCode: '4688'
    Creator_Process_Name | contains:
    - edge
    - chrome
    - firefox
    New_Process_Name|contains:
    - winword
    - excel
    - powerpoint
  condition: selection
level: high
author: demo
description: Detects Office macro opening from browser.
id: spearphishing
falsepositives:
- Low
title: Spearphishing with Link
logsource:
  index: main
  product: windows
```





```
category: process_event
status: experimental
tags:
- attack.initial_access
- attack.t1566.002
```

The second behavior represents when the macro executes commands on the file system. It contains STIX Relationship Objects (SRO) to the process identified in the first behavior as well as to a detection object with the following Sigma rule:

```
date: 2021/06/07
detection:
  condition: run_macro and (not false_positive)
  run_macro:
    Creator_Process_Name | contains:
    - word
    - powerpoint
    - excel
    New_Process_Name | endswith:
    - ".exe"
    - ".dll"
    EventCode: '4688'
  false_positive:
    New_Process_Name | contains:
    - splwow64
level: high
author: demo
description: Detects Office macro execution
id: execution
falsepositives:
- Low
title: Execution
logsource:
  index: main
  product: windows
  category: process_event
status: experimental
tags:
- attack.execution
- attack.t1059
```





The third behavior object represents observed behaviors for the adversary establishing persistence on the initial target via modification of the Windows registry. It contains SROs to an SCO for the registry modification observed as well as one to a detection object represented in the following Sigma rule:

```
date: 2021/06/07
detection:
  selection:
    EventCode: '4657'
    Object Name contains:
    - Run
    - Shell Folders
  condition: selection
level: high
author: demo
description: Detects new registry run key created event.
id: registry persistence
falsepositives:
- High
title: Registry Run Keys
logsource:
  index: main
  product: windows
  category: registry_event
status: experimental
tags:

    attack.persistence

- attack.t1547
```

Any single detection object analytic by itself may not detect the behavior without significant numbers of false positives. The detection grouping is intended to provide the correlation logic to execute all of these queries and include the proper common fields between the queries to further increase the confidence of successfully detecting a behavior.

In the current reference implementation, the detection group object has the ability to contain multiple styles of correlation workflow. For the example provided in the reference implementation, correlation workflows are provided in Collaborative Automated Course of Action Operations (CACAO) format as well as base64 encoded Business Process Modeling Notation (BPMN). Figure 7 provides a visualization of the BPMN workflow when extracted and decoded from the reference implementation.





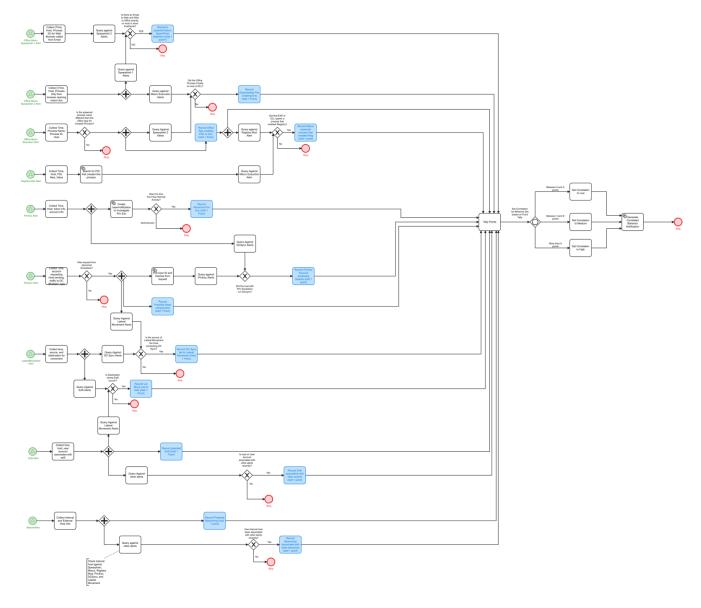


Figure 7: Conceptual process for detection correlation logic





2.3.4 Using a Received Behavior Set to Augment Network Defense Capability

Once the submitter of a threat intelligence bundle containing behaviors submits the information to a threat feed, the recipient organization can use the correlation information in the detection group to execute the individual queries from each analytic and apply the suggested logic to detect a behavior either automatically or manually, depending on the receiving organization's processes.

It is envisioned that automation will be heavily leveraged to conduct these detections and correlations. This is a key reason for selecting Sigma as there are free and open-source tools available to process Sigma rules to translate them to an organization's SIEM of choice. For example, a shared detection analytic from the earlier example:

```
date: 2021/06/07
detection:
  selection:
    Process_Command_Line | contains:
    - docm
    - xlsm
    - pptm
    EventCode: '4688'
    Creator_Process_Name|contains:

    edge

    - chrome
    - firefox
    New Process Name contains:
    - winword
    - excel
    - powerpoint
  condition: selection
level: high
author: demo
description: Detects Office macro opening from browser.
id: spearphishing
falsepositives:
- Low
title: Spearphishing with Link
logsource:
  index: main
  product: windows
  category: process event
status: experimental
tags:

    attack.initial access

attack.t1566.002
```





By providing this analytic in Sigma format, free tools can translate it to a variety of SIEM options that can be selected from the consumer of the bundle. This rule translates automatically into the following Splunk Query:

```
((Process Command Line="*docm*" OR Process Command Line="*xlsm*" OR
Process_Command_Line="*pptm*") EventCode="4688" (Creator_Process_Name="*edge*" OR
Creator Process Name="*chrome*" OR Creator Process Name="*firefox*")
(New Process Name="*winword*" OR New Process Name="*excel*" OR
New Process Name="*powerpoint*"))
It can also be automatically translated into another SIEM option such as Azure Sentinel:
  "$schema": "https://schema.management.azure.com/schemas/2019-04-
01/deploymentTemplate.json#",
  "contentVersion": "1.0.0.0",
  "parameters": {
    "workspace": {
      "type": "String"
  "resources": [
    {
"[concat(resourceId('Microsoft.OperationalInsights/workspaces/providers',
parameters('workspace'),
'Microsoft.SecurityInsights'), '/alertRules/spearphishing')]",
"[concat(parameters('workspace'),'/Microsoft.SecurityInsights/spearphishing')]",
      "type": "Microsoft.OperationalInsights/workspaces/providers/alertRules",
      "apiVersion": "2021-03-01-preview",
      "kind": "Scheduled",
      "properties": {
        "displayName": "Spearphishing with Link by demo",
        "description": "Detects Office macro opening from browser. Technique:
T1566.002.",
        "severity": "high",
        "enabled": true,
        "query": "Windows | where ((Process_Command_Line contains 'docm' or
Process Command Line contains 'xlsm' or Process Command Line contains 'pptm') and
EventCode == \"4688\" and (Creator_Process_Name contains 'edge' or
Creator_Process_Name contains 'chrome' or Creator_Process_Name contains
'firefox') and (New_Process_Name contains 'winword' or New_Process_Name contains
'excel' or New_Process_Name contains 'powerpoint'))",
        "queryFrequency": "PT30M",
        "queryPeriod": "PT30M",
        "triggerOperator": "GreaterThan",
        "triggerThreshold": 0,
        "suppressionDuration": "PT2H30M",
        "suppressionEnabled": true,
        "tactics": [
```





```
"InitialAccess"
      "incidentConfiguration": {
        "createIncident": true,
        "groupingConfiguration": {
          "enabled": false,
          "reopenClosedIncident": false,
          "lookbackDuration": "PT2H30M",
          "matchingMethod": "AllEntities",
          "groupByEntities": [],
          "groupByAlertDetails": [],
          "groupByCustomDetails": []
        }
      "eventGroupingSettings": {
        "aggregationKind": "SingleAlert"
      "alertDetailsOverride": null,
      "customDetails": null,
      "templateVersion": "1.0.0"
  }
]
```

Sigma is freely available via GitHub¹⁹ and at the time of the reference implementation analysis, the following tools were supported:

- ArcSight
- Azure Sentinel / Azure Log Analytics
- Devo
- ee-outliers
- Elastic X-Pack Watcher
- ElasticSearch Query DSL
- ElasticSearch Query Strings
- Grep with Perl-compatible regular expression support
- Kibana
- LimaCharlie
- LOGIQ
- Logpoint
- LogRhythm
- Microsoft Defender Advanced Threat Protection (MDATP)
- PowerShell
- QRadar
- Qualys
- RSA NetWitness

¹⁹ See section 2.3.4 for link to Sigma GitHub site.





- Splunk
- Structured Threat Information Expression (STIX)
- Sumologic
- uberAgent ESA

Once translated into the recipient's SIEM format, these rules can be used to detect the individual behaviors. These detections can then be translated into a series of SIEM alerts that can be forwarded to a new SIEM index. The correlation logic can then be transformed into an operational workflow (either manually executed or executed via automation) that can execute the correlation check when new alerts are generated. Once a medium or high confidence correlation is observed, a security operator can be notified to investigate the potential behavior sequence detection.

Once notified, the security operator can extract the recommend course of action and relevant playbook for execution either through manual or automated steps. Figure 8 displays the steps required to quarantine an affected system as identified in the shared playbook within the reference implementation.



Figure 8 Shared playbook for system quarantine

3. NEXT STEPS

The next phase of this research will investigate the incorporation of the reference implementation into official repositories for the Cyber Threat Intelligence Technical Committee within the OASIS standards body. These changes will be submitted for consideration as inclusions for a future STIX version.

4. ACKNOWLEDGEMENT

The IOB Sub-Project wishes to thank Dr. Vasileios Mavroeidis and his teams at University of Oslo / Cyentific AS for their technical discussions on best practices to represent CACAO playbooks within STIX.

5. CONCLUSION

APL provides this reference implementation and report to facilitate collaboration on research regarding machine readable representations of adversary behavior and to share our work with the larger cyber defense community in the hope that the community can collectively accelerate development of capabilities to defend against the ever-growing speed and scale of cyber threat. For any questions regarding this report, please contact the author via email (<u>Charles.Frick@jhuapl.edu</u>).





6. APPENDIX A: ACRONYMNS

APL Johns Hopkins University Applied Physics Laboratory

BPMN Business Process Modeling Notation

C2 Command and Control

CACAO Collaborative Automated Course of Action Operations

CISA Cybersecurity and Infrastructure Security Agency

CMU Carnegie Mellon University

COA Courses of Action

CTI Cyber Threat Intelligence

CUI Controlled Unclassified Information

CWD Current Working Directory

IACD Integrated Adaptive Cyber Defense

IOC Indicator of Compromise

JSON JavaScript Object Notation

MDATP Microsoft Defender Advanced Threat Protection

PID Process ID

RITA Real Intelligence Threat Analytics

SCO STIX Cyber Observables

SDO STIX Domain Object

SIEM Security Information and Event Management

SOAR Security Orchestration, Automation and Response

SRO STIX Relationship Object

STIX Structured Threat Information eXchange

TAXII Trusted Automated eXchange of Indicator Information

TIP Threat Intel Platform





7. APPENDIX B: COMPLETE BEHAVIOR SET STIX BUNDLE

```
"type": "bundle",
  "id": "bundle--7482bcf3-61b1-4189-9c8a-c1f62b8abfc1",
  "objects": [
    {
      "type": "campaign",
      "id": "campaign--f3bf3827-d9c5-414d-b0f0-610146ff5d85",
      "created": "2022-03-31T13:00:00.000Z"
      "modified": "2022-03-31T13:00:00.000Z",
      "name": "Reaper-Lite",
      "description": "This is an emulated version of the APT37 Reaper Campaign. It was created to
demonstrate the creation of machine readable STIX objects to represent adversary behavior.",
      "first_seen": "2022-03-31T13:00:00.000Z",
      "last seen": "2022-03-31T13:00:00.000Z"
    },
    {
      "type": "x-oca-behavior",
      "spec_version": "2.1",
      "id": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ab",
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894", "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "name": "Spearphish: Mail Client Opens Browser",
      "description": "An email client has opened a web browser. Although most instances of this behavior
are benign, it may indicate a victim clicking on a phishing link.",
      "behavior_class": "anomalous",
      "tactic": "INITIAL ACCESS",
      "technique": "T1566.002 Spearphishing Link",
      "first_seen": "2022-03-31T13:00:00.000Z",
      "platforms": [
          "operating_system": "Microsoft Windows",
          "version": "10"
        }
      ],
      "extensions": {
        "extension-definition--9c59fd79-4215-4ba2-920d-3e4f320e1e62": {
          "extension type": "new-sdo"
      }
    },
      "type": "x-oca-behavior",
      "spec_version": "2.1",
      "id": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890bc",
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894".
      "created": "2022-03-31T13:00:00.000Z"
      "modified": "2022-03-31T13:00:00.000Z"
      "name": "Spearphish: Browser Downloads Office Macro",
      "description": "A web browser downloads an Office file containing that contains Macros. Office
Macros may contain malicious code.",
      "behavior_class": "anomalous"
      "tactic": "INITIAL ACCESS",
      "technique": "T1566.002 Spearphishing Link",
      "first_seen": "2022-03-31T13:00:00.000Z",
      "platforms": [
        {
          "operating_system": "Microsoft Windows",
          "version": "10"
        }
      "extensions": {
        "extension-definition--9c59fd79-4215-4ba2-920d-3e4f320e1e62": {
           "extension_type": "new-sdo"
```





```
}
},
  "type": "x-oca-detector",
  "spec_version": "2.1",
  "id": "x-oca-detector--9441073d-119b-4ec9-aa08-8bdb1703ed56",
 "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894", "created": "2023-05-01T12:00:00.000Z",
  "modified": "2023-05-01T12:00:00.000Z",
  "name": "Rita",
"description": "A network traffic analysis tool."
  "cpe": "cpe:2.3:a:active_countermeasures:rita:4.7.0:*:*:*:*:*:*",
  "vendor": "Active Countermeasures, Inc.",
  "vendor_url": "https://www.activecountermeasures.com",
  "product": "RITA",
  "product_url": "https://github.com/activecm/rita",
  "product_version": "4.7.0",
  "detection_types": ["beacon"],
  "detector_data_categories": ["network"],
"detector_data_sources": ["zeek", "pcap"],
  "valid until": "2027-05-01T12:00:00.000Z",
  "extensions": {
     extension-definition--5cccba5c-0be4-450c-8672-b66e98515754": {
       "extension_type": "new-sdo"
 }
},
  "type": "x-oca-detector",
  "spec_version": "2.1",
  "id": "x-oca-detector--67330653-ac02-46c8-b9c2-25b837a2ed6d",
  "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894", "created": "2023-05-01T12:00:00.000Z",
  "modified": "2023-05-01T12:00:00.000Z",
  "name": "Zeek",
  "description": "A network security monitoring tool.",
  "cpe": "cpe:2.3:a:zeek:zeek:5.0.9:*:*:*:*:*:*:,
  "vendor": "Zeek",
  "vendor_url": "https://zeek.org",
  "product": "Zeek",
  "product url": "https://zeek.org/get-zeek/",
  "product_version": "5.0.9",
  "detection_types": ["dcsync"],
  "detector_data_categories": ["network"],
  "detector_data_sources": ["network tap"],
"valid_until": "2027-05-01T12:00:00.000Z",
  "extensions": {
    "extension-definition--5cccba5c-0be4-450c-8672-b66e98515754": {
       "extension_type": "new-sdo"
 }
},
  "type": "x-oca-detector",
  "spec_version": "2.1",
  "id": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e",
  "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894",
  "created": "2023-05-01T12:00:00.000Z"
  "modified": "2023-05-01T12:00:00.000Z",
  "name": "Sigma",
"description": "A generic signature format for log files.",
  "cpe": "cpe:2.3:a:sigmahq:sigma:0.21:*:*:*:*:*:,
  "vendor": "SigmaHQ",
  "vendor_url": "https://github.com/SigmaHQ",
  "product": "Sigma",
  "product_url": "https://github.com/SigmaHQ/sigma",
  "product_version": "0.21",
  "detection_types": ["log"],
```





```
"detector_data_categories": ["log"],
      "detector_data_sources": ["windows event log", "sysmon", "zeek", "rita"],
      "valid_until": "2027-05-01T12:00:00.000Z",
      "extensions": {
         extension-definition--5cccba5c-0be4-450c-8672-b66e98515754": {
           'extension_type": "new-sdo"
     }
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--ae96d1d8-41ab-4bf1-aad9-6bf704064404",
      "created": "2022-03-31T13:00:00.000Z", "modified": "2022-03-31T13:00:00.000Z"
      "relationship_type": "uses",
      "source_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ab",
      "target ref": "attack-pattern--2b742742-28c3-4e1b-bab7-8350d6300fa7"
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--7f91c908-73ea-40e2-91df-ec9d72e37005",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890bc",
      "target_ref": "attack-pattern--2b742742-28c3-4e1b-bab7-8350d6300fa7"
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--e38c15bc-224e-4d81-a899-dc3b6f8cee92",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "campaign--f3bf3827-d9c5-414d-b0f0-610146ff5d85"
      "target_ref": "attack-pattern--2b742742-28c3-4e1b-bab7-8350d6300fa7"
    },
      "modified": "2023-05-09T14:00:00.188Z",
      "name": "Spearphishing Link",
      "description": "Adversaries may send spearphishing emails with a malicious link in an attempt to
gain access to victim systems. Spearphishing with a link is a specific variant of spearphishing. It is
different from other forms of spearphishing in that it employs the use of links to download malware
contained in email, instead of attaching malicious files to the email itself, to avoid defenses that may
inspect email attachments. Spearphishing may also involve social engineering techniques, such as posing as
a trusted source.\n\nAll forms of spearphishing are electronically delivered social engineering targeted
at a specific individual, company, or industry. In this case, the malicious emails contain links.
Generally, the links will be accompanied by social engineering text and require the user to actively click
or copy and paste a URL into a browser, leveraging [User
Execution](https://attack.mitre.org/techniques/T1204). The visited website may compromise the web browser
using an exploit, or the user will be prompted to download applications, documents, zip files, or even
executables depending on the pretext for the email in the first place. Adversaries may also include links
that are intended to interact directly with an email reader, including embedded images intended to exploit
the end system directly. Additionally, adversaries may use seemingly benign links that abuse special
characters to mimic legitimate websites (known as an \"IDN homograph attack\").(Citation: CISA IDN ST05-
016)\n\nAdversaries may also utilize links to perform consent phishing, typically with OAuth 2.0 request
URLs that when accepted by the user provide permissions/access for malicious applications, allowing
adversaries to [Steal Application Access Token](https://attack.mitre.org/techniques/T1528)s.(Citation:
Trend Micro Pawn Storm OAuth 2017) These stolen access tokens allow the adversary to perform various
actions on behalf of the user via API calls. (Citation: Microsoft OAuth 2.0 Consent Phishing 2021)",
      "kill_chain_phases": [
          "kill chain name": "mitre-attack",
          "phase_name": "initial-access"
        }
      ],
```





```
"x mitre contributors": [
        "Philip Winther",
        "Shailesh Tiwary (Indian Army)",
        "Mark Wee",
        "Jeff Sakowicz, Microsoft Identity Developer Platform Services (IDPM Services)",
        "Saisha Agrawal, Microsoft Threat Intelligent Center (MSTIC)",
        "Kobi Haimovich, CardinalOps",
        "Menachem Goldstein"
      "x mitre deprecated": false,
      "x mitre_detection": "URL inspection within email (including expanding shortened links) can help
detect links leading to known malicious sites as well as links redirecting to adversary infrastructure
based by upon suspicious OAuth patterns with unusual TLDs.(Citation: Microsoft OAuth 2.0 Consent Phishing
2021). Detonation chambers can be used to detect these links and either automatically go to these sites to
determine if they're potentially malicious, or wait and capture the content if a user visits the
link.\n\nFiltering based on DKIM+SPF or header analysis can help detect when the email sender is
spoofed.(Citation: Microsoft Anti Spoofing)(Citation: ACSC Email Spoofing)\n\nBecause this technique
usually involves user interaction on the endpoint, many of the possible detections take place once [User
Execution](https://attack.mitre.org/techniques/T1204) occurs.",
      "x_mitre_domains": [
        "enterprise-attack"
      "x_mitre_is_subtechnique": true,
      "x_mitre_platforms": [
        "Linux",
        "macOS",
        "Windows"
        "Office 365",
        "SaaS",
        "Google Workspace"
      "x_mitre_version": "2.4",
      "x_mitre_data_sources": [
        "Network Traffic: Network Traffic Flow",
        "Application Log: Application Log Content",
        "Network Traffic: Network Traffic Content"
      "type": "attack-pattern",
      "id": "attack-pattern--2b742742-28c3-4e1b-bab7-8350d6300fa7",
      "created": "2020-03-02T19:15:44.182Z",
      "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "revoked": false,
      "external_references": [
          "source_name": "mitre-attack",
          "url": "https://attack.mitre.org/techniques/T1566/002",
          "external id": "T1566.002"
        },
          "source_name": "ACSC Email Spoofing",
          "description": "Australian Cyber Security Centre. (2012, December). Mitigating Spoofed Emails
Using Sender Policy Framework. Retrieved October 19, 2020."
          "url": "https://www.cyber.gov.au/sites/default/files/2019-
03/spoof_email_sender_policy_framework.pdf"
        },
          "source_name": "CISA IDN ST05-016",
          "description": "CISA. (2019, September 27). Security Tip (ST05-016): Understanding
Internationalized Domain Names. Retrieved October 20, 2020.",
          "url": "https://us-cert.cisa.gov/ncas/tips/ST05-016"
          "source_name": "Trend Micro Pawn Storm OAuth 2017",
          "description": "Hacquebord, F.. (2017, April 25). Pawn Storm Abuses Open Authentication in
Advanced Social Engineering Attacks. Retrieved October 4, 2019.",
          "url": "https://blog.trendmicro.com/trendlabs-security-intelligence/pawn-storm-abuses-open-
authentication-advanced-social-engineering-attacks"
       },
```





```
"source_name": "Microsoft OAuth 2.0 Consent Phishing 2021",
          "description": "Microsoft 365 Defender Threat Intelligence Team. (2021, June 14). Microsoft
delivers comprehensive solution to battle rise in consent phishing emails. Retrieved December 13, 2021.",
          "url": "https://www.microsoft.com/security/blog/2021/07/14/microsoft-delivers-comprehensive-
solution-to-battle-rise-in-consent-phishing-emails/
          "source_name": "Microsoft Anti Spoofing",
          "description": "Microsoft. (2020, October 13). Anti-spoofing protection in EOP. Retrieved
October 19, 2020.",

"url": "https://docs.microsoft.com/en-us/microsoft-365/security/office-365-security/anti-
spoofing-protection?view=o365-worldwide"
        }
      "object_marking_refs": [
        "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      "x_mitre_attack_spec_version": "3.1.0",
      "x_mitre_modified_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "spec_version": "2.1"
    },
      "type": "x-oca-behavior",
      "spec_version": "2.1",
      "id": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890aa",
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894", "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z"
      "name": "Office Macro executing commands",
      "description": "An Office Macro is executing commands. This may be malicious code being executed.",
      "behavior_class": "anomalous",
      "tactic": "EXECUTION",
      "technique": "T1059.001 Command/Script execution - VBA",
      "first seen": "2022-03-31T13:00:00.000Z",
      "platforms": [
        {
          "operating_system": "Microsoft Windows",
          "version": "10"
        }
      1.
       "extensions": {
        "extension-definition--9c59fd79-4215-4ba2-920d-3e4f320e1e62": {
          "extension_type": "new-sdo"
        }
      }
    },
      "type": "relationship",
      "spec_version": "2.1"
      "id": "relationship--399ee227-e888-4dcd-bbc8-b79cf5cff259",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref":
                     "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890aa",
      "target_ref": "attack-pattern--970a3432-3237-47ad-bcca-7d8cbb217736"
    },
      "type": "relationship",
      "spec_version": "2.1"
      "id": "relationship--81da5956-d9ea-4a09-9e3d-ab09be3cc3eb",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "uses",
      "source ref": "campaign--f3bf3827-d9c5-414d-b0f0-610146ff5d85",
      "target_ref": "attack-pattern--970a3432-3237-47ad-bcca-7d8cbb217736"
    },
    {
```



"Ross Brittain"



```
"modified": "2023-05-09T14:00:00.188Z",
      "name": "PowerShell",
      "description": "Adversaries may abuse PowerShell commands and scripts for execution. PowerShell is a
powerful interactive command-line interface and scripting environment included in the Windows operating
system.(Citation: TechNet PowerShell) Adversaries can use PowerShell to perform a number of actions,
including discovery of information and execution of code. Examples include the <code>Start-Process</code>
cmdlet which can be used to run an executable and the <code>Invoke-Command</code> cmdlet which runs a
command locally or on a remote computer (though administrator permissions are required to use PowerShell
to connect to remote systems).\n\nPowerShell may also be used to download and run executables from the
Internet, which can be executed from disk or in memory without touching disk.\n\nA number of PowerShell-
based offensive testing tools are available, including [Empire](https://attack.mitre.org/software/S0363),
[PowerSploit](https://attack.mitre.org/software/S0194), [PoshC2](https://attack.mitre.org/software/S0378),
and PSAttack.(Citation: Github PSAttack)\n\nPowerShell commands/scripts can also be executed without
directly invoking the <code>powershell.exe</code> binary through interfaces to PowerShell's underlying
<code>System.Management.Automation</code> assembly DLL exposed through the .NET framework and Windows
Common Language Interface (CLI).(Citation: Sixdub PowerPick Jan 2016)(Citation: SilentBreak Offensive PS
Dec 2015)(Citation: Microsoft PSfromCsharp APR 2014)",
      "kill_chain_phases": [
          "kill_chain_name": "mitre-attack",
          "phase_name": "execution"
       'x_mitre_contributors": [
        ____
"Mayuresh Dani, Qualys<sup>"</sup>,
        "Praetorian",
```

"x_mitre_deprecated": false, "x mitre detection": "If proper execution policy is set, adversaries will likely be able to define their own execution policy if they obtain administrator or system access, either through the Registry or at the command line. This change in policy on a system may be a way to detect malicious use of PowerShell. If PowerShell is not used in an environment, then simply looking for PowerShell execution may detect malicious activity.\n\nMonitor for loading and/or execution of artifacts associated with PowerShell specific assemblies, such as System. Management. Automation.dll (especially to unusual process names/locations).(Citation: Sixdub PowerPick Jan 2016)(Citation: SilentBreak Offensive PS Dec 2015)\n\nIt is also beneficial to turn on PowerShell logging to gain increased fidelity in what occurs during execution (which is applied to .NET invocations). (Citation: Malware Archaeology PowerShell Cheat Sheet) PowerShell 5.0 introduced enhanced logging capabilities, and some of those features have since been added to PowerShell 4.0. Earlier versions of PowerShell do not have many logging features.(Citation: FireEye PowerShell Logging 2016) An organization can gather PowerShell execution details in a data analytic platform to supplement it with other data.\n\nConsider monitoring for Windows event ID (EID) 400, which shows the version of PowerShell executing in the <code>EngineVersion</code> field (which may also be relevant to detecting a potential [Downgrade Attack](https://attack.mitre.org/techniques/T1562/010)) as well as if PowerShell is running locally or remotely in the <code>HostName</code> field. Furthermore, EID 400 may indicate the start time and EID 403 indicates the end time of a PowerShell session.(Citation: inv_ps_attacks)",

```
"x_mitre_domains": [
  "enterprise-attack"
"x_mitre_is_subtechnique": true,
"x_mitre_platforms": [
  _
"Windows"
"x_mitre_data_sources": [
  "Process: Process Metadata",
 "Script: Script Execution",
"Process: Process Creation"
  "Command: Command Execution",
  "Module: Module Load"
"x mitre remote support": true,
"type": "attack-pattern",
"id": "attack-pattern--970a3432-3237-47ad-bcca-7d8cbb217736",
"created": "2020-03-09T13:48:55.078Z",
"created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5".
"revoked": false,
```





```
"external references": [
        {
          "source_name": "mitre-attack",
          "url": "https://attack.mitre.org/techniques/T1059/001",
          "external_id": "T1059.001"
        },
          "source_name": "Microsoft PSfromCsharp APR 2014",
          "description": "Babinec, K. (2014, April 28). Executing PowerShell scripts from C#. Retrieved
April 22, 2019.",
          "url": "https://blogs.msdn.microsoft.com/kebab/2014/04/28/executing-powershell-scripts-from-c/"
          "source_name": "SilentBreak Offensive PS Dec 2015",
          "description": "Christensen, L.. (2015, December 28). The Evolution of Offensive PowerShell
Invocation. Retrieved December 8, 2018.",
          "url": "https://web.archive.org/web/20190508170150/https://silentbreaksecurity.com/powershell-
jobs-without-powershell-exe/"
        },
          "source_name": "FireEye PowerShell Logging 2016",
          "description": "Dunwoody, M. (2016, February 11). GREATER VISIBILITY THROUGH POWERSHELL LOGGING.
Retrieved February 16, 2016.",
          "url": "https://www.fireeye.com/blog/threat-research/2016/02/greater_visibilityt.html"
          "source_name": "Github PSAttack",
"description": "Haight, J. (2016, April 21). PS>Attack. Retrieved June 1, 2016.",
          "url": "https://github.com/jaredhaight/PSAttack"
        },
          "source_name": "inv_ps_attacks",
          "description": "Hastings, M. (2014, July 16). Investigating PowerShell Attacks. Retrieved
December 1, 2021.",
           "url": "https://powershellmagazine.com/2014/07/16/investigating-powershell-attacks/"
          "source_name": "Malware Archaeology PowerShell Cheat Sheet",
          "description": "Malware Archaeology. (2016, June). WINDOWS POWERSHELL LOGGING CHEAT SHEET - Win
7/Win 2008 or later. Retrieved June 24, 2016.",
          "url": "http://www.malwarearchaeology.com/s/Windows-PowerShell-Logging-Cheat-Sheet-ver-June-
2016-v2.pdf"
        },
          "source_name": "TechNet PowerShell",
"description": "Microsoft. (n.d.). Windows PowerShell Scripting. Retrieved April 28, 2016.",
          "url": "https://technet.microsoft.com/en-us/scriptcenter/dd742419.aspx"
        },
          "source_name": "Sixdub PowerPick Jan 2016",
          "description": "Warner, J.. (2015, January 6). Inexorable PowerShell \u2013 A Red Teamer\u2019s
Tale of Overcoming Simple AppLocker Policies. Retrieved December 8, 2018.",
          "url": "https://web.archive.org/web/20160327101330/http://www.sixdub.net/?p=367"
        }
      "object_marking_refs": [
        "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      "x_mitre_attack_spec_version": "3.1.0",
      "x_mitre_modified_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "spec version": "2.1"
    },
      "type": "x-oca-behavior",
      "spec_version": "2.1",
      "id": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890bb",
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894", "created": "2022-03-31T13:00:00.000Z",
```





```
"modified": "2022-03-31T13:00:00.000Z",
  "name": "Cobalt Strike Payload Beaconing",
  "description": "Network traffic matching a signature of Cobalt Strike's beaconing.",
  "behavior_class": "anomalous",
  "tactic": "Command and Control",
  "technique": "T1071.001 - Application Layer Protocol - Web Protocols",
  "first_seen": "2022-03-31T13:00:00.000Z",
  "platforms": [
      "operating_system": "Microsoft Windows",
"version": "10"
    }
  ],
  "extensions": {
    "extension-definition--9c59fd79-4215-4ba2-920d-3e4f320e1e62": {
      "extension_type": "new-sdo"
    }
 }
},
  "type": "ipv4-addr",
  "spec_version": "2.1",
  "id": "ipv4-addr--57a33521-9761-54a9-81de-3c11e441d86b",
  "value": "192.168.1.1"
{
  "type": "ipv4-addr"
  "spec_version": "2.1",
  "id": "ipv4-addr--bba1d187-08fb-5000-aed1-ef055c1dfd24",
  "value": "172.16.1.1"
},
  "type": "network-traffic",
  "spec_version": "2.1",
  "id": "network-traffic--15a157a8-26e3-56e0-820b-0c2a8e553a2c",
  "src_ref": "ipv4-addr--57a33521-9761-54a9-81de-3c11e441d86b",
  "src_port": 443,
  "dst_ref": "ipv4-addr--bba1d187-08fb-5000-aed1-ef055c1dfd24",
  "dst_port": 443,
  "protocols": [
    "ipv4",
   "tcp",
"http",
"https"
  "extensions": {
    "extension-definition--3b7505ce-2a18-496e-aa58-311dac6c1473": {
      "connections": 4022,
      "score": 0.834,
      "extension_type": "property-extension"
    }
 }
},
  "type": "x-oca-detection",
  "spec_version": "2.1",
  "id": "x-oca-detection--5899C5CC-CE20-44EE-806E-9F64EBA0B29F",
  "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894", "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z"
  "name": "Beacon Detection with RITA analytics",
  "data_sources": [
      "LogName": "Rita",
"Category": "show-beacons",
      "score_num": "> 0.7"
    }
  ],
```





```
"analytic": {
    "rule":
```

 $\label{thm:control} "LS0tcmRhdGU6IDIwMjIvMDMvMTYKdGl0bGU6IFJpdGEgQmVhY29uCmlk0iA5MmEyMWJ1Zi00MTM4LTQwYjYtYTK1NS000TdiMGN1MDUxN TkKc3RhdHVz0iBleHBlcmltZW50YWwKZGVzY3JpcHRpb246IERldGVjdGlvbiBiZWFjb25pbmcgd2l0aCBhIGhpZ2ggZW5vdWdoIHNjb3JlcnRhZ3M6CiAgLSBhdHRhY2suY29tbWFuZF9hbmRfY29udHJvbAogIC0gYXR0YWNrLnQxMDcxCmF1dGhvcjogZGVtbwpsb2dzb3VyY2U6CiAgcHJvZHVjdDogcml0YQogIGluZGV40iBtYWluCiAgY2F0ZWdvcnk6IHNob3ctYmVhY29ucwpkZXRlY3Rpb246CiAgc2VsZWN0aW9uOgogICAgc291cmNldHlwZTogcml0YS1sb2dzCiAgICBzY29yZV9udW18Z3Q6IDAuNwogIGNvbmRpdGlvbjogc2VsZWN0aW9uCmZhbHNlcG9zaXRpdmVzOgogIC0gVW5rbm93bgpsZXZlbDogbWVkaXVt",$

```
'type": "Sigma Rule - base64 encoded YAML file"
      "extensions": {
        "extension-definition--c4690e13-107e-4796-8158-0dcf1ae7bc89": {
          "extension_type": "new-sdo"
     }
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--C4CBC936-2936-450F-9E79-CE8E2F795A3D",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "detects",
      "source_ref": "x-oca-detection--5899C5CC-CE20-44EE-806E-9F64EBA0B29F",
      "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890bb"
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--258248c6-6363-461a-9b8b-452d0518b2a9",
      "created": "2022-03-31T13:00:00.000Z";
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890bb",
      "target ref": "attack-pattern--df8b2a25-8bdf-4856-953c-a04372b1c161"
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--45dcf923-f8b1-45bf-8788-055a7033d6ee",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z"
      "relationship_type": "uses",
      "source_ref": "campaign--f3bf3827-d9c5-414d-b0f0-610146ff5d85",
      "target ref": "attack-pattern--df8b2a25-8bdf-4856-953c-a04372b1c161"
    },
      "modified": "2023-04-11T15:21:27.965Z",
      "name": "Web Protocols",
      description": "Adversaries may communicate using application layer protocols associated with web"
traffic 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. \n\nProtocols such as HTTP/S(Citation: CrowdStrike Putter Panda) and
WebSocket(Citation: Brazking-Websockets) that carry web traffic may be very common in environments. HTTP/S
packets have many fields and headers in which data can be concealed. An adversary may abuse these
protocols to communicate with systems under their control within a victim network while also mimicking
normal, expected traffic.
      "kill_chain_phases": [
          "kill_chain_name": "mitre-attack",
          "phase name": "command-and-control"
        }
      ],
      "x_mitre_contributors": [
        "TruKno"
      'x_mitre_deprecated": false,
```



"object_marking_refs": [

"spec_version": "2.1"

"type": "x-oca-behavior",
"spec_version": "2.1",

},

"x_mitre_attack_spec_version": "3.1.0",

"created": "2022-03-31T13:00:00.000Z", "modified": "2022-03-31T13:00:00.000Z",

"name": "Registry modification for Persistence",

"marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"

"id": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890cc", "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894",

"x_mitre_modified_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",



"x_mitre_detection": "Analyze network data for uncommon data flows (e.g., a client sending significantly more data than it receives from a server). Processes utilizing the network that do not normally have network communication or have never been seen before are suspicious. Analyze packet contents to detect application layer protocols that do not follow the expected protocol standards regarding syntax, structure, or any other variable adversaries could leverage to conceal data.(Citation: University of Birmingham C2)\n\nMonitor for web traffic to/from known-bad or suspicious domains. ' "x_mitre_domains": ["enterprise-attack" "x mitre is subtechnique": true, "x_mitre_platforms": ["Linux", "macOS", "Windows" "x_mitre_version": "1.1" "x_mitre_data_sources": ["Network Traffic: Network Traffic Content", "Network Traffic: Network Traffic Flow" "type": "attack-pattern", "id": "attack-pattern--df8b2a25-8bdf-4856-953c-a04372b1c161", "created": "2020-03-15T16:13:46.151Z", "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5", "revoked": false, "external_references": ["source_name": "mitre-attack", "url": "https://attack.mitre.org/techniques/T1071/001", "external_id": "T1071.001" }, "source_name": "CrowdStrike Putter Panda", "description": "Crowdstrike Global Intelligence Team. (2014, June 9). CrowdStrike Intelligence Report: Putter Panda. Retrieved January 22, 2016.", "url": "http://cdn0.vox-cdn.com/assets/4589853/crowdstrike-intelligence-report-putterpanda.original.pdf" "source_name": "University of Birmingham C2", "description": "Gardiner, J., Cova, M., Nagaraja, S. (2014, February). Command & Control Understanding, Denying and Detecting. Retrieved April 20, 2016. "url": "https://arxiv.org/ftp/arxiv/papers/1408/1408.1136.pdf" }, "source_name": "Brazking-Websockets", "description": "Shahar Tavor. (n.d.). BrazKing Android Malware Upgraded and Targeting Brazilian Banks. Retrieved March 24, 2023.", "url": "https://securityintelligence.com/posts/brazking-android-malware-upgraded-targetingbrazilian-banks/" }





```
"description": "Modification of the Windows Registry may indicate an adversary attempting to
establish persistence.",
    "behavior_class": "anomalous",
      "tactic": "Persistence",
      "technique": "T1547.001 - Autostart Execution - Registry Run Keys / Startup Folder",
      "first_seen": "2022-03-31T13:00:00.000Z",
      "platforms": [
          "operating_system": "Microsoft Windows",
          "version": "10"
        }
      ],
       'extensions": {
        "extension-definition--9c59fd79-4215-4ba2-920d-3e4f320e1e62": {
          "extension_type": "new-sdo"
     }
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--8e796cf6-5401-4a23-9354-59b58155bd5e",
      "created": "2022-03-31T13:00:00.000Z", "modified": "2022-03-31T13:00:00.000Z"
      "relationship_type": "uses",
      "source_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890cc",
      "target_ref": "attack-pattern--9efb1ea7-c37b-4595-9640-b7680cd84279"
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--7a9afa0a-0c25-4dec-8f3d-db92e213643c",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "campaign--f3bf3827-d9c5-414d-b0f0-610146ff5d85",
      "target_ref": "attack-pattern--9efb1ea7-c37b-4595-9640-b7680cd84279"
    },
      "modified": "2023-05-09T14:00:00.188Z",
      "name": "Registry Run Keys / Startup Folder",
      "description": "Adversaries may achieve persistence by adding a program to a startup folder or
referencing it with a Registry run key. Adding an entry to the \"run keys\" in the Registry or startup
folder will cause the program referenced to be executed when a user logs in.(Citation: Microsoft Run Key)
These programs will be executed under the context of the user and will have the account's associated
permissions level.\n\nPlacing a program within a startup folder will also cause that program to execute
when a user logs in. There is a startup folder location for individual user accounts as well as a system-
wide startup folder that will be checked regardless of which user account logs in. The startup folder path
for the current user is <code>C:\\Users\\\[Username]\\AppData\\Roaming\\Microsoft\\Windows\\Start
Menu\\Programs\\Startup</code>. The startup folder path for all users is
<code>C:\\ProgramData\\Microsoft\\Windows\\Start Menu\\Programs\\StartUp</code>.\n\nThe following run keys
are created by default on Windows systems:\n\n*
<code>HKEY_CURRENT_USER\\Software\\Microsoft\\Windows\\CurrentVersion\\Run</code>\n*
<code>HKEY CURRENT USER\\Software\\Microsoft\\Windows\\CurrentVersion\\RunOnce</code>\n*
<code>HKEY LOCAL MACHINE\\Software\\Microsoft\\Windows\\CurrentVersion\\Run</code>\n*
<code>HKEY_LOCAL_MACHINE\\Software\\Microsoft\\Windows\\CurrentVersion\\RunOnce</code>\n\nRun keys may
exist under multiple hives.(Citation: Microsoft Wow6432Node 2018)(Citation: Malwarebytes Wow6432Node 2016)
The <code>HKEY_LOCAL_MACHINE\\Software\\Microsoft\\Windows\\CurrentVersion\\RunOnceEx</code> is also
available but is not created by default on Windows Vista and newer. Registry run key entries can reference
programs directly or list them as a dependency (Citation: Microsoft Run Key) For example, it is possible
to load a DLL at logon using a \"Depend\" key with RunOnceEx: <code>reg add
HKLM\\SOFTWARE\\Microsoft\\Windows\\CurrentVersion\\RunOnceEx\\0001\\Depend /v 1 /d
\"C:\\temp\\evil[.]dll\"</code> (Citation: Oddvar Moe RunOnceEx Mar 2018)\n\nThe following Registry keys
can be used to set startup folder items for persistence:\n\n*
<code>HKEY CURRENT USER\\Software\\Microsoft\\Windows\\CurrentVersion\\Explorer\\User Shell
Folders</code>\n* <code>HKEY_CURRENT_USER\\Software\\Microsoft\\Windows\\CurrentVersion\\Explorer\\Shell
Folders</code>\n* <code>HKEY_LOCAL_MACHINE\\SOFTWARE\\Microsoft\\Windows\\CurrentVersion\\Explorer\\Shell
Folders</code>\n* <code>\KEY_LOCAL_MACHINE\\SOFTWARE\\Microsoft\\Windows\\CurrentVersion\\Explorer\\User
```



"User"



Shell Folders</code>\n\nThe following Registry keys can control automatic startup of services during boot:\n\n* <code>HKEY LOCAL MACHINE\\Software\\Microsoft\\Windows\\CurrentVersion\\RunServicesOnce</code>\n* code>HKEY_CURRENT_USER\\Software\\Microsoft\\Windows\\CurrentVersion\\RunServicesOnce</code>\n< <code>HKEY_LOCAL_MACHINE\\Software\\Microsoft\\Windows\\CurrentVersion\\RunServices</code>\n* <code>HKEY_CURRENT_USER\\Software\\Microsoft\\Windows\\CurrentVersion\\RunServices</code>\n\nUsing policy settings to specify startup programs creates corresponding values in either of two Registry keys:\n\n* <code>HKEY LOCAL MACHINE\\Software\\Microsoft\\Windows\\CurrentVersion\\Policies\\Explorer\\Run</code>\n* code>HKEY_CURRENT_USER\\Software\\Microsoft\\Windows\\CurrentVersion\\Policies\\Explorer\\Run</code>\n\nt he Winlogon key controls actions that occur when a user logs on to a computer running Windows 7. Most of these actions are under the control of the operating system, but you can also add custom actions here. The <code>HKEY_LOCAL_MACHINE\\Software\\Microsoft\\Windows NT\\CurrentVersion\\Winlogon\\Userinit</code> and code>HKEY_LOCAL_MACHINE\\Software\\Microsoft\\Windows NT\\CurrentVersion\\Winlogon\\Shell</code> subkeys can automatically launch programs.\n\nPrograms listed in the load value of the registry key code>HKEY_CURRENT_USER\\Software\\Microsoft\\Windows NT\\CurrentVersion\\Windows</code> run when any user logs on.\n\nBy default, the multistring <code>BootExecute</code> value of the registry key <code>HKEY_LOCAL_MACHINE\\System\\CurrentControlSet\\Control\\Session Manager</code> is set to <code>autocheck autochk *</code>. This value causes Windows, at startup, to check the file-system integrity of the hard disks if the system has been shut down abnormally. Adversaries can add other programs or processes to this registry value which will automatically launch at boot.\n\nAdversaries can use these configuration locations to execute malware, such as remote access tools, to maintain persistence through system reboots. Adversaries may also use [Masquerading](https://attack.mitre.org/techniques/T1036) to make the Registry entries look as if they are associated with legitimate programs.", "kill chain phases": ["kill_chain_name": "mitre-attack", "phase_name": "persistence" }, "kill_chain_name": "mitre-attack", "phase_name": "privilege-escalation" "x_mitre_attack_spec_version": "2.1.0", "x mitre contributors": [____ "Oddvar Moe, @oddvarmoe", "Dray Agha, @Purp1eW0lf, Huntress Labs" "x_mitre_deprecated": false, "x_mitre_detection": "Monitor Registry for changes to run keys that do not correlate with known software, patch cycles, etc. Monitor the start folder for additions or changes. Tools such as Sysinternals Autoruns may also be used to detect system changes that could be attempts at persistence, including listing the run keys' Registry locations and startup folders. (Citation: TechNet Autoruns) Suspicious program execution as startup programs may show up as outlier processes that have not been seen before when compared against historical data.\n\nChanges to these locations typically happen under normal conditions when legitimate software is installed. To increase confidence of malicious activity, data and events

should not be viewed in isolation, but as part of a chain of behavior that could lead to other activities, such as network connections made for Command and Control, learning details about the environment through

```
Discovery, and Lateral Movement.",
      "x_mitre_domains": [
        "enterprise-attack"
      "x_mitre_is_subtechnique": true,
      "x mitre modified by ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "x_mitre_platforms": [
        "Windows"
      "x_mitre_version": "1.2",
      "x_mitre_data_sources": [
        "Windows Registry: Windows Registry Key Creation",
        "Windows Registry: Windows Registry Key Modification",
        "Command: Command Execution",
        "Process: Process Creation",
        "File: File Modification"
       'x_mitre_permissions_required": [
        "Administrator",
```





```
"type": "attack-pattern",
"type": "attack-pattern-96
      "id": "attack-pattern--9efb1ea7-c37b-4595-9640-b7680cd84279",
      "created": "2020-01-23T22:02:48.566Z",
      "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "revoked": false,
      "external_references": [
          "source_name": "mitre-attack",
          "url": "https://attack.mitre.org/techniques/T1547/001",
          "external_id": "T1547.001"
        },
          "source_name": "Malwarebytes Wow6432Node 2016",
          "description": "Arntz, P. (2016, March 30). Hiding in Plain Sight. Retrieved August 3, 2020.",
          "url": "https://blog.malwarebytes.com/cybercrime/2013/10/hiding-in-plain-sight/"
        },
          "source_name": "Microsoft Wow6432Node 2018",
"description": "Microsoft. (2018, May 31). 32-bit and 64-bit Application Data in the Registry.
Retrieved August 3, 2020.",
          "url": "https://docs.microsoft.com/en-us/windows/win32/sysinfo/32-bit-and-64-bit-application-
data-in-the-registry"
        },
          "source_name": "Microsoft Run Key",
          "description": "Microsoft. (n.d.). Run and RunOnce Registry Keys. Retrieved November 12, 2014.",
          "url": "http://msdn.microsoft.com/en-us/library/aa376977"
          "source_name": "Oddvar Moe RunOnceEx Mar 2018",
          "description": "Moe, O. (2018, March 21). Persistence using RunOnceEx - Hidden from
Autoruns.exe. Retrieved June 29, 2018."
          "url": "https://oddvar.moe/2018/03/21/persistence-using-runonceex-hidden-from-autoruns-exe/"
        },
          "source_name": "TechNet Autoruns";
          "description": "Russinovich, M. (2016, January 4). Autoruns for Windows v13.51. Retrieved June
}
      "object marking refs": [
        "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      ],
"spec_version": "2.1"
    },
      "type": "x-oca-behavior",
      "spec_version": "2.1",
      "id": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890dd",
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "name": "Secondary Payload Privilege Escalation Behavior",
      "description": "A privilege escalation has occurred which may indicate adversary activity.",
      "behavior_class": "anomalous",
      "tactic": {}^-Privilege Escalation",
      "technique": "T1134.001 - Access token manipulation - Token impersonation",
      "first_seen": "2022-03-31T13:00:00.000Z",
      "platforms": [
          "operating_system": "Microsoft Windows",
          "version": "10"
        }
      ],
       'extensions": {
        "extension-definition--9c59fd79-4215-4ba2-920d-3e4f320e1e62": {
```





```
"extension type": "new-sdo"
     }
    },
      "type": "x-oca-detection",
      "spec_version": "2.1",
      "id": "x-oca-detection--f27cb358-d747-47ba-a6c4-e5b8debab157",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z";
      "name": "Secondary Payload Privilege Escalation Detection",
      "data_sources": [
        {
          "data_type": "WinEventLog",
          "LogName": "Security",
          "EventCode": "4688",
          "TaskCategory": "Process Creation",
          "Message": "A new process has been created.\r\n\r\nCreator Subject:\r\n\tSecurity ID:\t\tS-1-5-
21-3073171905-3635715100-2267507973-1219\r\n\tAccount Name:\t\tjsmith\r\n\tAccount
Domain:\t\tCBIS\r\n\tLogon ID:\t\t0x502695\r\n\r\nTarget Subject:\r\n\tSecurity ID:\t\tS-1-5-
18\r\n\tAccount Name:\t\tSP25-TARGET$\r\n\tAccount Domain:\t\tCBIS\r\n\tLogon ID:\t\t0x3E7\r\n\r\nProcess
Information:\r\n\tNew Process ID:\t\t0x27584\r\n\tNew Process
Name:\tC:\\Users\\jsmith.CBIS\\AppData\\Local\\beacon.exe\r\n\tToken Elevation
Type:\t%%1936\r\n\tMandatory Label:\t\tS-1-16-16384\r\n\tCreator Process ID:\t0x26b70\r\n\tCreator Process
Name:\tC:\\Users\\jsmith\\AppData\\Local\\PrintSpoofer64.exe\r\n\tProcess Command
Line:\tC:\\Users\\jsmith.CBIS\\Appdata\\local\\Beacon.exe\r\n\r\nToken Elevation Type indicates the type
of token that was assigned to the new process in accordance with User Account Control policy.\r\n\Type
1 is a full token with no privileges removed or groups disabled. A full token is only used if User
Account Control is disabled or if the user is the built-in Administrator account or a service
account.\r\n\r\nType 2 is an elevated token with no privileges removed or groups disabled. An elevated
token is used when User Account Control is enabled and the user chooses to start the program using Run as
administrator. An elevated token is also used when an application is configured to always require
administrative privilege or to always require maximum privilege, and the user is a member of the
Administrators group.\r\n\r\nType 3 is a limited token with administrative privileges removed and
administrative groups disabled. The limited token is used when User Account Control is enabled, the
application does not require administrative privilege, and the user does not choose to start the program
using Run as administrator."
       }
      'analytic": {
        "type": "Sigma Rule",
        "rule":
"LS0tCmF1dGhvcjogZGVtbwpkYXR10iAyMDIyLzAzLzA0CmR1c2NyaXB0aW9u0iBEZXR1Y3RzIGxvY2FsIHVzZXIgc3Bhd25pbmcgYSBwc
m9jZXNzIGFzIFNZU1RFTQpkZXR1Y3Rpb246CiAgY29uZGl0aW9uOiBzZWx1Y3Rpb24xIGFuZCBub3Qgc2VsZWN0aW9uMgogIHN1bGVjdG1
vbjE6CiAgICB1c2VyfGNvbnRhaW5z0iAiJCIKICAgIEV2ZW50Q29kZTogNDY4OAogIHNlbGVjdGlvbjI6CiAgICBzcmNfdXNlcnxjb250Y
WluczogIiQiCmZhbHNlcG9zaXRpdmVzOgogIC0gTG93Cmlk0iB1c2VydG9zeXN0ZW1wcm9jcHJpdmVzYwpsZXZlbDogaGlnaApsb2dzb3V
yY2U6CiAgY2F0ZWdvcnk6IHByb2Nlc3NfZXZlbnQKICBpbmRleDogbWFpbgogIHByb2R1Y3Q6IHdpbmRvd3MKc3RhdHVz0iBleHBlcmltZ
W50YWwKdGFnczoKICAtIGF0dGFjay5wcm12aWx1Z2UtZXNjYWxhdGlvbgogIC0gYXR0YWNrL1QxMTM0LjAwMQp0aXRsZTogdXN1ciB0byB
zeXN0ZW0gcHJvY2VzcyBwcml2aWxlZ2UgZXNjYWxhdGlvbg=="
      'extensions": {
        "extension-definition--c4690e13-107e-4796-8158-0dcf1ae7bc89": {
          "extension_type": "new-sdo"
        }
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894"
    },
      "type": "relationship",
      "spec_version": "2.1"
      "id": "relationship--18568ee3-837f-48d3-b807-a5f64ab3b9d8",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "detects",
      "source_ref": "x-oca-detection--f27cb358-d747-47ba-a6c4-e5b8debab157",
      "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890dd"
    },
    {
```





```
"type": "process"
      "spec_version": "2.1",
      "id": "process--3BCFB0A5-BAF5-411D-B9D0-8D4B4E09BA82",
      "is_hidden": false,
      "pid": 0,
      "cwd": "C:\\Users\\jsmith.CBIS\\AppData\\Local\\",
      "command_line": "C:\\Users\\jsmith.CBIS\\AppData\\Local\\Beacon.exe",
      "extensions": {
        "extension-definition--f9dbe89c-0030-4a9d-8b78-0dcd0a0de874": {
          "extension_type": "property-extension",
          "action": "created",
"user": "SP25-TARGET$",
          "src_user": "jsmith"
          "win_event_code": "4688"
        }
      },
"created_time": "2022-03-31T13:00:00.000Z",
      "defanged": false
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--a7e2ab2a-cdf5-45d0-bbe2-e6ecdb95ca99",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890dd",
      "target_ref": "attack-pattern--86850eff-2729-40c3-b85e-c4af26da4a2d"
    },
    {
      "type": "relationship",
      "spec_version": "2.1"
      "id": "relationship--4655b19d-c949-45be-8316-e8861c634cab",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "campaign--f3bf3827-d9c5-414d-b0f0-610146ff5d85",
      "target_ref": "attack-pattern--86850eff-2729-40c3-b85e-c4af26da4a2d"
    },
      "modified": "2023-04-11T21:19:05.544Z",
      "name": "Token Impersonation/Theft",
      "description": "Adversaries may duplicate then impersonate another user's existing token to escalate
privileges and bypass access controls. For example, an adversary can duplicate an existing token using
`DuplicateToken` or `DuplicateTokenEx`. The token can then be used with `ImpersonateLoggedOnUser` to allow
the calling thread to impersonate a logged on user's security context, or with `SetThreadToken` to assign
the impersonated token to a thread.\n\nAn adversary may perform [Token
Impersonation/Theft](https://attack.mitre.org/techniques/T1134/001) when they have a specific, existing
process they want to assign the duplicated token to. For example, this may be useful for when the target
user has a non-network logon session on the system.\n\nWhen an adversary would instead use a duplicated
token to create a new process rather than attaching to an existing process, they can additionally [Create
Process with Token](https://attack.mitre.org/techniques/T1134/002) using `CreateProcessWithTokenW` or
`CreateProcessAsUserW`. [Token Impersonation/Theft](https://attack.mitre.org/techniques/T1134/001) is also
distinct from [Make and Impersonate Token](https://attack.mitre.org/techniques/T1134/003) in that it
refers to duplicating an existing token, rather than creating a new one.",
      "kill_chain_phases": [
          "kill_chain_name": "mitre-attack",
          "phase_name": "defense-evasion"
          "kill_chain_name": "mitre-attack",
          "phase_name": "privilege-escalation"
        }
      "x_mitre_contributors": [
        _____
"Jonny Johnson"
      ],
```





```
"x_mitre_deprecated": false,
      "x_mitre_detection": "If an adversary is using a standard command-line shell, analysts can detect
token manipulation by auditing command-line activity. Specifically, analysts should look for use of the
<code>runas</code> command. Detailed command-line logging is not enabled by default in Windows.(Citation:
Microsoft Command-line Logging)\n\nAnalysts can also monitor for use of Windows APIs such as
<code>DuplicateToken(Ex)</code>, <code> ImpersonateLoggedOnUser </code>, and <code> SetThreadToken </code>
and correlate activity with other suspicious behavior to reduce false positives that may be due to normal
benign use by users and administrators.",
      "x_mitre_domains": [
        "enterprise-attack"
      "x_mitre_is_subtechnique": true,
      "x_mitre_platforms": [
        "Windows"
      "x_mitre_version": "1.1"
      "x_mitre_data_sources": [
        "Command: Command Execution",
        "Process: OS API Execution"
      "x_mitre_defense_bypassed": [
        "Windows User Account Control",
        "System access controls",
        "File system access controls"
      "type": "attack-pattern",
      "id": "attack-pattern--86850eff-2729-40c3-b85e-c4af26da4a2d",
      "created": "2020-02-18T16:39:06.289Z",
      "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "revoked": false,
      "external_references": [
        {
          "source_name": "mitre-attack",
          "url": "https://attack.mitre.org/techniques/T1134/001",
          "external id": "T1134.001"
        },
          "source_name": "Microsoft Command-line Logging",
          "description": "Mathers, B. (2017, March 7). Command line process auditing. Retrieved April 21,
2017.",
          "url": "https://technet.microsoft.com/en-us/windows-server-docs/identity/ad-ds/manage/component-
updates/command-line-process-auditing"
        }
      "object marking refs": [
        "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      "x_mitre_attack_spec_version": "3.1.0",
      "x_mitre_modified_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "spec_version": "2.1"
    },
      "type": "x-oca-behavior",
      "spec_version": "2.1",
      "id": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ee"
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z"
      "name": "Credential Access Behavior with DCSync and Kerberoasting",
      "description": "A DCSync may have occurred, allowing an adversary access to the Domain Controller's
credentials. The adversary may obtain password hashes via Kerberoasting and attempt to crack them.",
      "behavior_class": "anomalous",
      "tactic": "Credential Access"
      "technique": "T1003.006 - OS Credential dumping - DCSync",
      "first seen": "2022-03-31T13:00:00.000Z",
      "platforms": [
          "operating_system": "Microsoft Windows",
```





```
"version": "10"
        }
      "extensions": {
        "extension-definition--9c59fd79-4215-4ba2-920d-3e4f320e1e62": {
           "extension_type": "new-sdo"
      }
    },
      "type": "x-oca-detection",
      "spec_version": "2.1",
      "id": "x-oca-detection--275bf485-736d-4aa5-b172-e34d28faa58c",
      "created": "2022-03-31T13:00:00.000Z";
      "modified": "2022-03-31T13:00:00.000Z"
      "name": "DC Sync Detection",
      "data_sources": [
          "data_type": "notice-too_small",
          "LogName": "/nsm/zeek/logs/current/notice.log"
        }
      ],
      "analytic": {
   "type": "Sigma Rule",
        "rule":
"LS0tCnRpdGx10iBEQ1N5bmMKaWQ6IGRjc3luYwpzdGF0dXM6IGV4cGVyaW11bnRhbApkZXNjcmlwdGlvbjogRGV0ZWN0cyBuZXR3b3JrI
GFjdGl2aXR5IHVzaW5nIERSUØdldE5DQ2hhbmdlcy4KdGFnczoKICAtIGFØdGFjay5jcmVkZW50aWFsX2FjY2VzcwogIC0gYXR0YWNrLlQ
xMDAzLjAwNgphdXRob3I6IGRlbW8KZGF0ZTogMjAyMS8wNi8wNwpsb2dzb3VyY2U6CiAgcHJvZHVjdDogemVlawogIGluZGV4OiBtYWluC
iAgY2F0ZWdvcnk6IG51dHdvcmtfZXZlbnQKZGV0ZWN0aW9uOgogIHNlbGVjdGlvbjoKICAgIG1zZzogJ2Ryc3VhcGk6OkRSU0dldE5DQ2h
hbmdlcycKICBjb25kaXRpb246IHNlbGVjdGlvbgpmYWxzZXBvc2l0aXZlczoKICAtIERvbWFpbiBDb250cm9sbGVyCmxldmVsOiBoaWdo"
      "extensions": {
         extension-definition--c4690e13-107e-4796-8158-0dcf1ae7bc89": {
          "extension_type": "new-sdo"
        }
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894"
      "type": "relationship",
      "spec version": "2.1"
      "id": "relationship--d993c3af-9443-44db-9478-b3a9d632d94d",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "detects",
      "source_ref": "x-oca-detection--275bf485-736d-4aa5-b172-e34d28faa58c",
      "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ee"
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--d4ce259f-f595-4d1d-913c-e17454396dba",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ee",
      "target_ref": "attack-pattern--f303a39a-6255-4b89-aecc-18c4d8ca7163"
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--ca57a603-b4d6-475e-be8d-7618fbd58fbb",
      "created": "2022-03-31T13:00:00.000Z",
"modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "campaign--f3bf3827-d9c5-414d-b0f0-610146ff5d85",
      "target_ref": "attack-pattern--f303a39a-6255-4b89-aecc-18c4d8ca7163"
    },
```





```
"x_mitre_platforms": [
        "Windows"
       'x_mitre_domains": [
        "enterprise-attack"
      "x mitre contributors": [
        _
"ExtraHop",
        "Vincent Le Toux"
      "object_marking_refs": [
        "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      ],
"id": "attack-pattern--f303a39a-6255-4b89-aecc-18c4d8ca7163",
...
      "type": "attack-pattern",
      "created": "2020-02-11T18:45:34.293Z",
      "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "external_references": [
        {
         "source_name": "mitre-attack",
"external_id": "T1003.006",
          "url": "https://attack.mitre.org/techniques/T1003/006"
        },
          "url": "https://msdn.microsoft.com/library/cc228086.aspx",
          "description": "Microsoft. (2017, December 1). MS-DRSR Directory Replication Service (DRS)
Remote Protocol. Retrieved December 4, 2017."
          "source_name": "Microsoft DRSR Dec 2017"
       },
          "url": "https://msdn.microsoft.com/library/dd207691.aspx",
          "description": "Microsoft. (n.d.). IDL_DRSGetNCChanges (Opnum 3). Retrieved December 4, 2017.",
          "source_name": "Microsoft GetNCCChanges"
        },
          "url": "https://wiki.samba.org/index.php/DRSUAPI",
          "description": "SambaWiki. (n.d.). DRSUAPI. Retrieved December 4, 2017.", "source_name": "Samba DRSUAPI"
        },
          "url": "https://source.winehq.org/WineAPI/samlib.html",
          "description": "Wine API. (n.d.). samlib.dll. Retrieved December 4, 2017.",
          "source_name": "Wine API samlib.dll"
        },
          "url": "https://adsecurity.org/?p=1729",
          "description": "Metcalf, S. (2015, September 25). Mimikatz DCSync Usage, Exploitation, and
Detection. Retrieved August 7, 2017."
          "source_name": "ADSecurity Mimikatz DCSync"
        },
          "url": "http://www.harmj0y.net/blog/redteaming/mimikatz-and-dcsync-and-extrasids-oh-my/",
          "description": "Schroeder, W. (2015, September 22). Mimikatz and DCSync and ExtraSids, Oh My.
Retrieved August 7, 2017."
          "source_name": "Harmj0y Mimikatz and DCSync"
          ChangeNTLM",
          "description": "Warren, J. (2017, July 11). Manipulating User Passwords with Mimikatz. Retrieved
December 4, 2017.",
          "source name": "InsiderThreat ChangeNTLM July 2017"
          "url": "https://github.com/gentilkiwi/mimikatz/wiki/module-~-lsadump",
          "description": "Deply, B., Le Toux, V. (2016, June 5). module ~ lsadump. Retrieved August 7,
2017.",
```





```
"source name": "GitHub Mimikatz lsadump Module"
        },
          "url": "https://msdn.microsoft.com/library/cc237008.aspx",
          "description": "Microsoft. (2017, December 1). MS-NRPC - Netlogon Remote Protocol. Retrieved
December 6, 2017.",
          "source_name": "Microsoft NRPC Dec 2017"
        },
          "url": "https://msdn.microsoft.com/library/cc245496.aspx",
          "description": "Microsoft. (n.d.). MS-SAMR Security Account Manager (SAM) Remote Protocol
(Client-to-Server) - Transport. Retrieved December 4, 2017.",
          "source_name": "Microsoft SAMR"
          "url": "https://adsecurity.org/?p=1729",
          "description": "Metcalf, S. (2015, September 25). Mimikatz DCSync Usage, Exploitation, and
Detection. Retrieved December 4, 2017.",
          "source_name": "AdSecurity DCSync Sept 2015"
        },
          "url": "http://www.harmj0y.net/blog/redteaming/mimikatz-and-dcsync-and-extrasids-oh-my/",
          "description": "Schroeder, W. (2015, September 22). Mimikatz and DCSync and ExtraSids, Oh My.
Retrieved December 4, 2017.",
          "source_name": "Harmj0y DCSync Sept 2015"
        }
      "modified": "2022-04-25T14:00:00.188Z",
      "name": "DCSync",
      "description": "Adversaries may attempt to access credentials and other sensitive information by
abusing a Windows Domain Controller's application programming interface (API)(Citation: Microsoft DRSR Dec
2017) (Citation: Microsoft GetNCCChanges) (Citation: Samba DRSUAPI) (Citation: Wine API samlib.dll) to
simulate the replication process from a remote domain controller using a technique called
DCSync.\n\nMembers of the Administrators, Domain Admins, and Enterprise Admin groups or computer accounts
on the domain controller are able to run DCSync to pull password data(Citation: ADSecurity Mimikatz
DCSync) from Active Directory, which may include current and historical hashes of potentially useful
accounts such as KRBTGT and Administrators. The hashes can then in turn be used to create a [Golden
Ticket](https://attack.mitre.org/techniques/T1558/001) for use in [Pass the
Ticket](https://attack.mitre.org/techniques/T1550/003)(Citation: Harmj0y Mimikatz and DCSync) or change an
account's password as noted in [Account
Manipulation](https://attack.mitre.org/techniques/T1098).(Citation: InsiderThreat ChangeNTLM July
2017)\n\nDCSync functionality has been included in the \"lsadump\" module in
[Mimikatz](https://attack.mitre.org/software/S0002).(Citation: GitHub Mimikatz lsadump Module) Lsadump
also includes NetSync, which performs DCSync over a legacy replication protocol.(Citation: Microsoft NRPC
Dec 2017)",
      "kill_chain_phases": [
          "kill_chain_name": "mitre-attack",
          "phase_name": "credential-access"
      "x mitre_detection": "Monitor domain controller logs for replication requests and other unscheduled
activity possibly associated with DCSync.(Citation: Microsoft DRSR Dec 2017) (Citation: Microsoft
GetNCCChanges) (Citation: Samba DRSUAPI) Also monitor for network protocols(Citation: Microsoft DRSR Dec
2017) (Citation: Microsoft NRPC Dec 2017) and other replication requests(Citation: Microsoft SAMR) from
IPs not associated with known domain controllers.(Citation: AdSecurity DCSync Sept 2015)\n\nNote: Domain
controllers may not log replication requests originating from the default domain controller
account.(Citation: Harmj0y DCSync Sept 2015)",
      "x_mitre_is_subtechnique": true,
      "x_mitre_version": "1.0"
      "x mitre modified by ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "x_mitre_data_sources": [
        "Network Traffic: Network Traffic Flow",
        "Network Traffic: Network Traffic Content"
        "Active Directory: Active Directory Object Access"
       'x_mitre_permissions_required": [
        "Administrator"
```





```
"x_mitre_attack_spec_version": "2.1.0"
    },
      "type": "network-traffic",
      "spec_version": "2.1",
      "id": "network-traffic--acffdf9a-bafd-5b74-a7d9-1a6d5a4e9c5a",
      "src_ref": "ipv4-addr--57a33521-9761-54a9-81de-3c11e441d86b",
      "dst ref": "ipv4-addr--429ddae0-a1ff-543d-99b4-f12a4a144c70",
      "protocols": [
        "ipv4",
        "tcp",
        "smb"
      ]
    },
      "type": "ipv4-addr",
      "spec_version": "2.1"
      "id": "ipv4-addr--429ddae0-a1ff-543d-99b4-f12a4a144c70",
      "value": "192.168.1.2"
    },
      "type": "x-oca-behavior",
      "spec_version": "2.1",
      "id": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ff",
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894", "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z"
      "name": "Abnormal internal network traffic for Lateral Movement",
      "description": "Network traffic matching a pattern which may indicate lateral movement done by an
adversary.",
      "behavior_class": "anomalous",
      "tactic": "Lateral Movement",
      "technique": "T1558.001 - Steal Or Forge Kerberos Tickets - Golden Ticket",
      "first_seen": "2022-03-31T13:00:00.000Z",
      "platforms": [
        {
          "operating_system": "Microsoft Windows",
          "version": "10"
        }
      ],
      "extensions": {
        "extension-definition--9c59fd79-4215-4ba2-920d-3e4f320e1e62": {
          "extension type": "new-sdo"
        }
      }
    },
      "type": "x-oca-detection",
      "spec_version": "2.1",
      "id": "x-oca-detection--40a941cc-42df-4b2e-b607-6d74168084b9",
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "name": "Lateral Movement Detection",
      "data_sources": [
          "data_type": "WinEventLog",
          "LogName": "WinEventLog:Security"
        }
      ],
      "analytic": {
        "type": "Sigma Rule",
        "rule":
```

"YXV0aG9yOiBkZW1vCmRhdGU6IDIwMjIvMDMvMDQKZGVzY3JpcHRpb246IERldGVjdHMgcHJlLWNvcnJlbGF0ZWQgZXZlbnRzIHRhZ2dlZ CBhcyBwb3RlbnRpYWwgR29sZGVuIFRpY2tldCBhdHRlbXBzCmlkOiA5MmEyMWJlZi00MTM4LTQwYjYtYtk1NS00OTdiMGNlMDUxNTEKc3R hdHVzOiBleHBlcmltZW50YWWKdGFnczoKICAtIGF0dGFjay5jcmVkZW50aWFsX2FjY2VzcwogIC0gYXR0YWNrLnQxNTU4LjAwMQpsb2dzb





3VyY2U6IAogIHByb2R1Y3Q6IHdpbmRvd3MKICBpbmRleDogbWFpbgogIGNhdGVnb3J50iBrZXJiZXJvcwpkZXR1Y3Rpb246CiAgc2VsZWN 0aW9u0iAKICAgIHNvdXJjZXR5cGU6IGludGVybmFsX2FsZXJ0cwogICAgYWxlcnRfdHlwZXxjb250YWluczogIkdvbGRlblRpY2tldCIKI CBjb25kaXRpb246IHNlbGVjdGlvbgpmYWxzZXBvc2l0aXZlczoKICAtIERvbWFpbiBDb250cm9sbGVycwogIC0gRXhjaGFuZ2UKbGV2ZWw 6IGhpZ2g="

```
"extensions": {
        "extension-definition--c4690e13-107e-4796-8158-0dcf1ae7bc89": {
          "extension type": "new-sdo"
      }
    },
      "type": "domain-name",
      "spec_version": "2.1",
"id": "domain-name--8713b93b-186e-524d-9224-db3b8f9fb9ef",
      "value": "data-server-domain",
      "resolves_to_refs": [
        "ipv4-addr--3d4ee4f2-a895-5781-a0cc-b5ba466f053d"
      ]
      "type": "network-traffic",
      "spec_version": "2.1",
      "id": "network-traffic--3564fb7d-d65c-5e02-9f55-a8a960f5c9f5",
      "src_ref": "ipv4-addr--57a33521-9761-54a9-81de-3c11e441d86b";
      "dst_ref": "domain-name--8713b93b-186e-524d-9224-db3b8f9fb9ef",
      "protocols": [
         "ipv4",
        "tcp",
      ]
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--19856de6-739c-4b31-b0cc-aaa6b0b751c8",
      "created": "2022-03-31T13:00:00.000Z"
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "detects",
      "source_ref": "x-oca-detection--40a941cc-42df-4b2e-b607-6d74168084b9",
      "target ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ff"
    },
      "type": "relationship",
      "spec version": "2.1",
      "id": "relationship--c9a2a2b3-67f3-4b8a-ad40-17c8098f7205",
      "created": "2022-03-31T13:00:00.000Z";
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ff",
      "target_ref": "attack-pattern--7b211ac6-c815-4189-93a9-ab415deca926"
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--baf7f0f2-1aa8-45cb-b306-cbca8dd863d1",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "campaign--f3bf3827-d9c5-414d-b0f0-610146ff5d85",
      "target ref": "attack-pattern--7b211ac6-c815-4189-93a9-ab415deca926"
    },
      "modified": "2023-03-30T21:01:38.108Z",
      "name": "Pass the Ticket",
      "description": "Adversaries may \u201cpass the ticket\u201d using stolen Kerberos tickets to move
laterally within an environment, bypassing normal system access controls. Pass the ticket (PtT) is a
method of authenticating to a system using Kerberos tickets without having access to an account's
```





```
password. Kerberos authentication can be used as the first step to lateral movement to a remote
system.\n\nWhen preforming PtT, valid Kerberos tickets for [Valid
Accounts](https://attack.mitre.org/techniques/T1078) are captured by [OS Credential
Dumping](https://attack.mitre.org/techniques/T1003). A user's service tickets or ticket granting ticket
(TGT) may be obtained, depending on the level of access. A service ticket allows for access to a
particular resource, whereas a TGT can be used to request service tickets from the Ticket Granting Service
(TGS) to access any resource the user has privileges to access.(Citation: ADSecurity AD Kerberos
Attacks)(Citation: GentilKiwi Pass the Ticket)\n\nA [Silver
Ticket](https://attack.mitre.org/techniques/T1558/002) can be obtained for services that use Kerberos as
an authentication mechanism and are used to generate tickets to access that particular resource and the
system that hosts the resource (e.g., SharePoint).(Citation: ADSecurity AD Kerberos Attacks)\n\nA [Golden
Ticket](https://attack.mitre.org/techniques/T1558/001) can be obtained for the domain using the Key
Distribution Service account KRBTGT account NTLM hash, which enables generation of TGTs for any account in
Active Directory.(Citation: Campbell 2014)\n\nAdversaries may also create a valid Kerberos ticket using
other user information, such as stolen password hashes or AES keys. For example, \"overpassing the hash\"
involves using a NTLM password hash to authenticate as a user (i.e. [Pass the
Hash](https://attack.mitre.org/techniques/T1550/002)) while also using the password hash to create a valid
Kerberos ticket.(Citation: Stealthbits Overpass-the-Hash)",
      "kill_chain_phases": [
          "kill_chain_name": "mitre-attack",
          "phase_name": "defense-evasion"
        {
          "kill_chain_name": "mitre-attack",
          "phase_name": "lateral-movement"
       x_mitre_contributors": [
        "Vincent Le Toux",
        "Rvan Becwar"
      ^{
m "}x_mitre_detection": "Audit all Kerberos authentication and credential use events and review for
discrepancies. Unusual remote authentication events that correlate with other suspicious activity (such as
writing and executing binaries) may indicate malicious activity.\n\nEvent ID 4769 is generated on the
Domain Controller when using a golden ticket after the KRBTGT password has been reset twice, as mentioned
in the mitigation section. The status code 0x1F indicates the action has failed due to \"Integrity check
on decrypted field failed\" and indicates misuse by a previously invalidated golden ticket.(Citation:
CERT-EU Golden Ticket Protection)",
      "x_mitre_domains": [
        "enterprise-attack"
      "x mitre is subtechnique": true,
      "x mitre modified by ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "x mitre platforms": [
        "Windows"
      "x_mitre_version": "1.1",
      "x_mitre_data_sources": [
        "Logon Session: Logon Session Creation",
        "User Account: User Account Authentication"
        "Active Directory: Active Directory Credential Request"
      "x_mitre_defense_bypassed": [
        "System Access Controls"
      "x_mitre_system_requirements": [
        "Kerberos authentication enabled"
      "type": "attack-pattern",
      "id": "attack-pattern--7b211ac6-c815-4189-93a9-ab415deca926",
      "created": "2020-01-30T17:03:43.072Z",
      "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "external_references": [
          "source_name": "mitre-attack",
          "url": "https://attack.mitre.org/techniques/T1550/003",
          "external_id": "T1550.003"
```





```
"source_name": "ADSecurity AD Kerberos Attacks",
           "description": "Metcalf, S. (2014, November 22). Mimikatz and Active Directory Kerberos Attacks.
Retrieved June 2, 2016.",
"url": "https://adsecurity.org/?p=556"
          "source_name": "GentilKiwi Pass the Ticket",
           "description": "Deply, B. (2014, January 13). Pass the ticket. Retrieved June 2, 2016.",
           "url": "http://blog.gentilkiwi.com/securite/mimikatz/pass-the-ticket-kerberos"
        },
           "source_name": "Campbell 2014",
           "description": "Campbell, C. (2014). The Secret Life of Krbtgt. Retrieved December 4, 2014.",
           "url": "http://defcon.org/images/defcon-22/dc-22-presentations/Campbell/DEFCON-22-Christopher-
Campbell-The-Secret-Life-of-Krbtgt.pdf"
          "source\_name": "Stealthbits Overpass-the-Hash",\\
          "description": "Warren, J. (2019, February 26). How to Detect Overpass-the-Hash Attacks.
Retrieved February 4, 2021.",
           "url": "https://stealthbits.com/blog/how-to-detect-overpass-the-hash-attacks/"
        },
          "source_name": "CERT-EU Golden Ticket Protection",
"description": "Abolins, D., Boldea, C., Socha, K., Soria-Machado, M. (2016, April 26). Kerberos
Golden Ticket Protection. Retrieved July 13, 2017.",
          "url": "https://cert.europa.eu/static/WhitePapers/UPDATED%20-%20CERT-
EU_Security_Whitepaper_2014-007_Kerberos_Golden_Ticket_Protection_v1_4.pdf"
        }
       "object_marking_refs": [
        "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      "x_mitre_attack_spec_version": "3.1.0",
      "spec_version": "2.1"
    },
      "type": "x-oca-behavior",
      "spec_version": "2.1",
      "id": "x-oca-behavior--DE81EF18-55E6-4754-A761-6B929BF22395",
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "name": "Exfiltration Behavior via Beacon",
      "description": "Adversary exfiltrates data from the target network.",
      "behavior_class": "anomalous",
      "tactic": "Exfiltration",
      "technique": "T1041 - Exfiltration over C2 Channel", "first_seen": "2022-03-31T13:00:00.000Z",
      "platforms": [
          "operating_system": "Microsoft Windows",
"version": "10"
        }
      ],
       'extensions": {
        "extension-definition--9c59fd79-4215-4ba2-920d-3e4f320e1e62": {
           "extension_type": "new-sdo"
        }
      }
    },
      "type": "x-oca-detection",
      "spec_version": "2.1",
      "id": "x-oca-detection--66aa9c25-8b56-4121-8630-dbe457393b27",
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894";
```





```
"created": "2022-03-31T13:00:00.000Z"
      "modified": "2022-03-31T13:00:00.000Z<sup>*</sup>,
      "name": "Data Exfiltration Detection",
      "data_sources": [
          "data_type": "zeek",
          "LogName": [
            "/nsm/zeek/logs/current/files.log",
            "SMR"
         ]
       }
      ],
      'analytic": {
        "type": "Sigma Rule",
        "rule":
"YXV0aG9y0iBkZW1vCmRhdGU6IDIwMjIvMDMvMDQKZGVzY3JpcHRpb246IER1dGVjdHMgYSBkb3dubG9hZCBmcm9tIGEgc2Vuc210aXZ1I
G1vbml0b3J1ZCBkaXJ1Y3RvcnkKaWQ6IDkyYTIxYmVmLTQxMzgtNDBiNi1hOTU1LTQ5N2IwY2UwNTE1MApzdGF0dXM6IGV4cGVyaW11bnR
hbAp0YWdzOgogIC0gYXR0YWNrLmV4ZmlsdHJhdGlvbgogIC0gYXR0YWNrLnQxMDQxCmxvZ3NvdXJjZTogCiAgcHJvZHVjdDogemVlawogI
GluZGV40iBtyWluCiAgY2F0ZWdvcnk6IGZpbGVzCmRldGVjdGlvbjoKICBzZWxlY3Rpb246IAogICAgc291cmNldHlwZTogemVlawogICA
SIKICBjb25kaXRpb246IHNlbGVjdGlvbgpmYWxzZXBvc2l0aXZlczoKICAtIEFwcHJvdmVkIEFjY2Vzc29ycwpsZXZlbDogaGlnaA=="
      },
      "extensions": {
        extension-definition--c4690e13-107e-4796-8158-0dcf1ae7bc89": {
          "extension_type": "new-sdo"
       }
     }
    },
      "type": "ipv4-addr",
      "spec_version": "2.1",
      "id": "ipv4-addr--3d4ee4f2-a895-5781-a0cc-b5ba466f053d",
      "value": "192.168.1.3"
      "type": "network-traffic",
      "spec_version": "2.1",
      "id": "network-traffic--fcff628d-d69f-5d23-88b0-aeedcfb7da7c",
      "src_ref": "ipv4-addr--3d4ee4f2-a895-5781-a0cc-b5ba466f053d",
      "dst_ref": "ipv4-addr--57a33521-9761-54a9-81de-3c11e441d86b",
      "protocols": [
        "ipv4",
        "tcp"
     ]
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--94aaccf3-e8c4-41c0-985a-473f46312bb7",
      "created": "2022-03-31T13:00:00.000Z",
"modified": "2022-03-31T13:00:00.000Z"
      "relationship_type": "detects",
      "source_ref": "x-oca-detection--66aa9c25-8b56-4121-8630-dbe457393b27",
      "target_ref": "x-oca-behavior--DE81EF18-55E6-4754-A761-6B929BF22395"
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--c4e4b439-2662-47e1-b961-2b6a6fae5241",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "uses",
      "source ref": "x-oca-behavior--DE81EF18-55E6-4754-A761-6B929BF22395",
      "target_ref": "attack-pattern--92d7da27-2d91-488e-a00c-059dc162766d"
    },
      "type": "relationship",
      "spec_version": "2.1"
```





```
"id": "relationship--fd55f673-53b0-4ae1-915b-6f30b20c950b",
      "created": "2022-03-31T13:00:00.000Z", "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "campaign--f3bf3827-d9c5-414d-b0f0-610146ff5d85",
      "target_ref": "attack-pattern--92d7da27-2d91-488e-a00c-059dc162766d"
    {
      "modified": "2023-05-09T14:00:00.188Z",
      "name": "Exfiltration Over C2 Channel",
      "description": "Adversaries may steal data by exfiltrating it over an existing command and control
channel. Stolen data is encoded into the normal communications channel using the same protocol as command
and control communications.",
      "kill_chain_phases": [
          "kill_chain_name": "mitre-attack",
          "phase name": "exfiltration"
        }
      ],
       "x_mitre_contributors": [
        "William Cain"
      "x_mitre_deprecated": false,
"x_mitre_detection": "Analyze network data for uncommon data flows (e.g., a client sending
significantly more data than it receives from a server). Processes utilizing the network that do not
normally have network communication or have never been seen before are suspicious. Analyze packet contents
to detect communications that do not follow the expected protocol behavior for the port that is being
used. (Citation: University of Birmingham C2)",
      "x_mitre_domains": [
        "enterprise-attack"
      "x_mitre_is_subtechnique": false,
       "x_mitre_platforms": [
        "Linux",
        "macOS",
        "Windows"
      "x_mitre_version": "2.2",
      "x_mitre_data_sources": [
        "Network Traffic: Network Traffic Content",
        "Network Traffic: Network Traffic Flow",
        "File: File Access",
        "Network Traffic: Network Connection Creation",
        "Command: Command Execution"
      "x_mitre_network_requirements": false,
      "type": "attack-pattern",
      "id": "attack-pattern--92d7da27-2d91-488e-a00c-059dc162766d",
      "created": "2017-05-31T21:30:41.804Z",
      "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "revoked": false,
      "external_references": [
        {
          "source_name": "mitre-attack",
"url": "https://attack.mitre.org/techniques/T1041",
          "external_id": "T1041"
        },
          "source_name": "University of Birmingham C2",
          "description": "Gardiner, J., Cova, M., Nagaraja, S. (2014, February). Command & Control
Understanding, Denying and Detecting. Retrieved April 20, 2016."
          "url": "https://arxiv.org/ftp/arxiv/papers/1408/1408.1136.pdf"
        }
      "object_marking_refs": [
          "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      "x_mitre_attack_spec_version": "3.1.0",
```





```
"x_mitre_modified_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
  "spec_version": "2.1
{
  "type": "identity",
  "spec_version": "2.1",
 "id": "identity--b085a68a-bf48-4316-9667-37af78cba894",
 "created": "2022-03-31T13:00:00.000Z",
  "modified": "2023-05-23T10:09:00.000Z",
  "name": "OCA"
},
  "type": "identity",
  "spec_version": "2.1",
"id": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
  "created": "2017-06-01T00:00:00.000Z",
  "modified": "2022-04-25T14:00:00.188Z",
  "name": "The MITRE Corporation",
  "identity_class": "organization",
  "object_marking_refs": [
    "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
  "x_mitre_attack_spec_version": "2.1.0",
  "x_mitre_domains": [
    "enterprise-attack"
  "x_mitre_version": "1.0"
},
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--d99350ec-bc5b-4d92-8990-ae6b08ffce7a",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "occurs-before",
  "source_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890bc",
  "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890aa"
},
  "type": "relationship",
  "spec version": "2.1"
  "id": "relationship--d3f134d4-bf65-477c-927e-1b0e87630e38",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "occurs-before",
  "source_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ab",
 "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890bc"
},
  "type": "relationship",
  "spec_version": "2.1"
 "id": "relationship--3ad280cd-42f7-49b6-88ff-d2ee35a175b6",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "occurs-before",
  "source_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890aa",
  "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890bb"
},
  "type": "relationship",
  "spec_version": "2.1"
  "id": "relationship--0347363b-b476-4bff-8203-a585febf21bb",
  "created": "2022-03-31T13:00:00.000Z",
"modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "occurs-before",
  "source_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890aa",
  "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890cc"
},
```





```
"type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--87c4aca0-6b97-4fe9-ab99-ab5ba7f3db95",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z"
      "relationship_type": "occurs-before",
      "source ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890bb",
      "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890dd"
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--33da2e36-637b-47a7-ae95-d8ae192fb3d2",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "occurs-before",
      "source_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890dd",
      "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ee"
      "type": "relationship",
      "spec_version": "2.1"
      "id": "relationship--72fc61e3-67d7-497e-900b-faf26173bd71",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "occurs-before";
      "source_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ee",
      "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ff"
    },
      "type": "relationship",
      "spec_version": "2.1"
      "id": "relationship--88ae0ce8-96d8-4886-a5aa-bbc0a32c3a3f",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "occurs-before",
      "source_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ff",
      "target_ref": "x-oca-behavior--DE81EF18-55E6-4754-A761-6B929BF22395"
    },
      "type": "extension-definition",
      "spec version": "2.1",
      "id": "extension-definition--9c59fd79-4215-4ba2-920d-3e4f320e1e62",
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894", "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z"
      "name": "x-oca-behavior Extension Definition",
      "description": "This schema creates a new object type called x-oca-behavior. x-oca-behavior objects
describe higher-level functionality than can be described using SCOs."
      "schema": "https://raw.githubusercontent.com/opencybersecurityalliance/oca-
iob/main/apl_reference_implementation_bundle/revision_2/schemas/sdos/behavior.json",
      "version": "1.0.0",
      "extension_types": [
   "new-sdo"
      ]
    },
      "type": "extension-definition",
      "spec_version": "2.1"
      "id": "extension-definition--5cccba5c-0be4-450c-8672-b66e98515754",
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894", "created": "2023-05-01T12:00:00.000Z",
      "modified": "2023-05-01T12:00:00.000Z"
      "name": "x-oca-detector Extension Definition",
      "description": "This schema creates a new object type called detector, which describes software that
is capable of performing detections.",
```





```
"schema": "https://raw.githubusercontent.com/opencybersecurityalliance/oca-
iob/main/apl_reference_implementation_bundle/revision_2/schemas/sdos/detector.json",
      "version": "1.0.0",
      "extension_types": [
        "new-sdo"
      ]
    },
      "type": "extension-definition",
      "spec_version": "2.1",
      "id": "extension-definition--c4690e13-107e-4796-8158-0dcf1ae7bc89"
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z"
      "name": "x-oca-detection Extension Definition",
      "description": "This schema creates a new object type called detection, which contain queries or
other actionable information that can identify an event or behavior.",
      "schema": "https://raw.githubusercontent.com/opencybersecurityalliance/oca-
iob/main/apl_reference_implementation_bundle/revision_2/schemas/sdos/detection.json",
      "version": "1.0.0",
      "extension_types": [
        "new-sdo"
      ]
    },
      "type": "extension-definition",
      "spec_version": "2.1",
      "id": "extension-definition--f9dbe89c-0030-4a9d-8b78-0dcd0a0de874",
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894",
      "created": "2022-03-31T13:00:00.000Z"
      "modified": "2022-03-31T13:00:00.000Z"
      "name": "x-oca-process Extension Definition",
      "description": "This schema extends the Process SCO with additional Windows Event Log fields.",
      "schema": "https://raw.githubusercontent.com/opencybersecurityalliance/oca-
iob/main/apl_reference_implementation_bundle/revision_2/schemas/observables/extended-process.json",
      "version": "1.0.0",
      "extension_types": [
        "property-extension"
      ]
    },
      "type": "relationship",
      "spec version": "2.1",
      "id": "relationship--e82c60ee-78e1-4056-a2e0-2ed73571605d",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "detects",
      "source_ref": "x-oca-detection--58834c29-4ceb-42a1-a218-336103021000",
      "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890aa"
    },
      "type": "windows-registry-key",
      "spec_version": "2.1",
      "id": "windows-registry-key--c5a4244e-22d5-5797-8f78-c5fc3d1c0bde",
      "key": "\\REGISTRY\\MACHINE\\SOFTWARE\\Microsoft\\Windows\\CurrentVersion\\Run",
      "values": [
          "name": "persist"
        }
      "extensions": {
        extension-definition--2cf8c8c2-69f5-40f7-aa34-efcef2b912b1": {
          "action": "modify",
          "new_value": "true"
          "process_id": "0x0"
          "process_name": "C:\\Windows\\regedit.exe",
          "extension_type": "property-extension"
        }
```





```
}
    },
      "type": "process",
      "spec_version": "2.1"
      "id": "process--862e625d-48bb-489e-8d4e-f7d8cd2fcaaa",
      "is_hidden": false,
      "cwd": "C:\\Program Files\\Microsoft Office\\Office14\\",
      "command_line": "C:\\Program Files\\Microsoft Office\\Office14\\OUTLOOK.EXE",
      "extensions": {
         extension-definition--f9dbe89c-0030-4a9d-8b78-0dcd0a0de874": {
          "extension_type": "property-extension",
          "action": "created"
          "new_process_name": [
            "OUTLOOK.EXE"
          "win_event_code": "4688"
        }
      },
      "created_time": "2022-03-31T13:00:00.000Z",
      "defanged": false
    },
      "type": "process",
      "spec_version": "2.1",
      "id": "process--862e625d-48bb-489e-8d4e-f7d8cd2fcbbb",
      "is_hidden": false,
      "pid": 0,
      "cwd": "C:\\Program Files\\Microsoft Office\\Office14\\",
      "command_line": "C:\\User\\jsmith.CBIS\\AppData\\Local\\Google\\Chrome\\Application\\chrome.exe --
single-argument https://172.25.1.19/download/test.docm",
      "parent_ref": "process--862e625d-48bb-489e-8d4e-f7d8cd2fcaaa",
      "extensions": {
        "extension-definition--f9dbe89c-0030-4a9d-8b78-0dcd0a0de874": {
          "extension_type": "property-extension",
           "action": "created",
          "creator_process_name": [
             "OUTLOOK.EXE"
           "new process name": [
            "chrome.exe"
          "win_event_code": "4688"
        }
      "created_time": "2022-03-31T13:00:00.000Z",
      "defanged": false
    },
      "type": "process",
      "spec_version": "2.1",
      "id": "process--862e625d-48bb-489e-8d4e-f7d8cd2fcccc",
      "is_hidden": false,
      "pid": 0,
      "cwd": "C:\\User\\jsmith.CBIS\\AppData\\Local\\Google\\Chrome\\Application\\",
"command_line": "'C:\\Program Files\\Microsoft Office\\Office14\\WINWORD.EXE' /n
'C:\\Users\\jsmith.CBIS\\Downloads\\test.docm'",
      "parent_ref": "process--862e625d-48bb-489e-8d4e-f7d8cd2fcbbb",
      "extensions": {
        "extension-definition--f9dbe89c-0030-4a9d-8b78-0dcd0a0de874": {
          "extension_type": "property-extension",
          "action": "created",
          "creator_process_name": [
             "chrome.exe"
           "new_process_name": [
            "WINWORD.EXE"
```





```
"win_event_code": "4688"
    }
  },
  "created_time": "2022-03-31T13:00:00.000Z",
  "defanged": false
  "type": "process",
  "spec version": "2.1"
  "id": "process--862e625d-48bb-489e-8d4e-f7d8cd2fcddd",
  "is_hidden": false,
  "pid": 0,
  "cwd": "C:\\Program Files\\Microsoft Office\\Office14\\",
  "command_line": "C:\\Users\\JSMITH.CBIS\\AppData\\Local\\Temp\\rad99952.tmp.exe",
  "parent_ref": "process--862e625d-48bb-489e-8d4e-f7d8cd2fcccc",
  "extensions": {
    "extension-definition--f9dbe89c-0030-4a9d-8b78-0dcd0a0de874": {
      "extension_type": "property-extension",
      "action": "created"
      "creator_process_name": [
        "WINWORD.EXE"
      "new_process_name": [
        "C:\\Users\\JSMITH.CBIS\\AppData\\Local\\Temp\\rad99952.tmp.exe"
      "win_event_code": "4688"
    }
  },
  "created_time": "2022-03-31T13:00:00.000Z",
  "defanged": false
},
  "type": "x-oca-detection",
  "spec_version": "2.1",
  "id": "x-oca-detection--58834c29-4ceb-42a1-a218-336103021111",
  "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894",
  "created": "2022-03-31T13:00:00.000Z"
  "modified": "2022-03-31T13:00:00.000Z",
  "name": "Process 1 - SpearPhish",
  "data sources": [
    {
      "EventCode": "4688",
      "LogName": "Security",
      "TaskCategory": "Process Creation",
"data_type": "WinEventLog:Security",
      "Creator_Process_Name": [
        "*outlook*",
        "*thunderbird*",
        "*mail*"
      "New_Process_Name": [
        "*edge*"
        "*chrome*"
        "*firefox*"
      ]
    }
  "analytic": {
    "rule":
```

"type": "Sigma Rule - base64 encoded YAML file"





```
"extensions": {
                    "extension-definition--c4690e13-107e-4796-8158-0dcf1ae7bc89": {
                         "extension_type": "new-sdo"
              }
         },
               "type": "x-oca-detection",
               "spec_version": "2.1",
               "id": "x-oca-detection--58834c29-4ceb-42a1-a218-336103021222",
              "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894", "created": "2022-03-31T13:00:00.000Z",
               "modified": "2022-03-31T13:00:00.000Z",
               "name": "Process 2 - SpearPhish",
               "data_sources": [
                   {
                        "EventCode": "4688",
                        "LogName": "Security",
                        "TaskCategory": "Process Creation"
                        "data_type": "WinEventLog:Security",
                        "Creator_Process_Name": [
                             "*edge*"
                             "*chrome*"
                             "*firefox*"
                         "Creator_Command_Line": [
                             "*docm*",
"*pptm*",
                             "*xlsm*"
                         "New_Process_Name": [
                             "*word*",
                             "*powerpoint*",
                             "*excel*"
                       ]
                   }
               "analytic": {
                   "rule":
"LS0tCnRpdGxlOiBTcGVhcnBoaXNoaW5nIHdpdGggTGluawppZDogc3BlYXJwaGlzaGluZwpzdGF0dXM6IGV4cGVyaW1lbnRhbApkZXNjc
mlwdGlvbjogRGV0ZWN0cyBPZmZpY2UgbWFjcm8gb3BlbmluZyBmcm9tIGJyb3dzZXIuCnRhZ3M6Ci0gYXR0YWNrLmluaXRpYWxfYWNjZXN
zCi0gYXR0VWNrLnQxNTY2LjAwMgphdXRob3I6IGR1bW8KZGF0ZTogMjAyMS8wNi8wNwpsb2dzb3VyY2U6CiAgcHJvZHVjdDogd21uZG93c
wog {\tt IGluZGV40iBtYWluCiAgY2F0ZWdvcnk6IHByb2Nlc3NfZXZlbnQKZGV0ZWN0aW9uOgogIHNlbGVjdGlvbjoKICAgIEV2ZW50Q29kZTollogus{\tt IR}{\tt IR}{\tt
gJzQ2ODgnCiAgICBOZXdfUHJvY2Vzc19OYW11fGNvbnRhaW5zOgogICAgLSB3aW53b3JkCiAgICAtIGV4Y2VsCiAgICAtIHBvd2VycG9pb
nQKICAgIFByb2Nlc3NfQ29tbWFuZF9MaW51fGNvbnRhaW5zOgogICAgLSBkb2NtCiAgICAtIHhsc20KICAgIC0gcHB0bQogICAgQ3J1YXR
vcl9Qcm9jZXNzX05hbWV8Y29udGFpbnM6CiAgICAtIGVkZ2UKICAgIC0gY2hyb21lCiAgICAtIGZpcmVmb3gKICBjb25kaXRpb246IHNlb
GVjdGlvbgpmYWxzZXBvc2l0aXZlczoKLSBMb3cKbGV2ZWw6IGhpZ2g=",
                     'type": "Sigma Rule - base64 encoded YAML file"
                'extensions": {
                    "extension-definition--c4690e13-107e-4796-8158-0dcf1ae7bc89": {
                        "extension_type": "new-sdo"
              }
         },
               "type": "x-oca-detection",
               "spec_version": "2.1",
              "id": "x-oca-detection--58834c29-4ceb-42a1-a218-336103021000",
              "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894", "created": "2022-03-31T13:00:00.000Z",
               "modified": "2022-03-31T13:00:00.000Z",
               "name": "Process - Execution",
              "data sources": [
                        "EventCode": "4688";
                        "LogName": "Security",
```





```
"TaskCategory": "Process Creation",
                        "data_type": "WinEventLog:Security",
                        "Creator_Process_Name": [
                             "*word*",
                             "*powerpoint*",
                             "*excel*"
                        "New Process Name": [
                            "*.exe",
"*.dll"
                       ]
                   }
              ],
               "analytic": {
                   "rule":
"LS0tCnRpdGxl0iBFeGVjdXRpb24KaWQ6IGV4ZWN1dGlvbgpzdGF0dXM6IGV4cGVyaW1lbnRhbApkZXNjcmlwdGlvbjogRGV0ZWN0cyBPZ
mZpY2UgbWFjcm8gZXhlY3V0aW9uCnRhZ3M6Ci0gYXR0YWNrLmV4ZWN1dGlvbgotIGF0dGFjay50MTA10QphdXRob3I6IGRlbW8KZGF0ZTo
gMjAyMS8wNi8wNwpsb2dzb3VyY2U6CiAgcHJvZHVjdDogd2luZG93cwogIGluZGV40iBtYWluCiAgY2F0ZWdvcnk6IHByb2Nlc3NfZXZlb
nQKZGV0ZWN0aW9uOgogIGNvbmRpdGlvbjogcnVuX21hY3JvIGFuZCAobm90IGZhbHNlX3Bvc2l0aXZlKQogIHJ1bl9tYWNybzoKICAgIEN
yZWF0b3JfUHJvY2Vzc190YW11fGNvbnRhaW5z0gogICAgLSB3b3JkCiAgICAtIHBvd2VycG9pbnQKICAgIC0gZXhjZWwKICAgIE51d19Qc
m9jZXNzX05hbWV8ZW5kc3dpdGg6CiAgICAtICIuZXhl1gogICAgLSAiLmRsbCIKICAgIEV2ZW50Q29kZTogJzQ2ODgnCiAgZmFsc2VfcG9
zaXRpdmU6CiAgICBOZXdfUHJvY2Vzc190YW11fGNvbnRhaW5zOgogICAgLSBzcGx3b3c2NApmYWxzZXBvc2l0aXZlczoKLSBMb3cKbGV2Z
Ww6IGhpZ2g=",
                    "type": "Sigma Rule - base64 encoded YAML file"
                'extensions": {
                     extension-definition--c4690e13-107e-4796-8158-0dcf1ae7bc89": {
                         "extension_type": "new-sdo"
             }
         },
              "type": "x-oca-detection",
              "spec_version": "2.1",
              "id": "x-oca-detection--458c02c9-3635-42e4-8873-6785e00517e7",
              "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894", "created": "2022-03-31T13:00:00.000Z",
              "modified": "2022-03-31T13:00:00.000Z",
              "name": "Registry - Persistence",
              "data_sources": [
                   {
                       "EventCode": "4657";
                        "LogName": "Security",
                        2379380313-1247321256-500\n\tAccount Name:\t\tAdministrator\n\tAccount Domain:\t\tSP17\n\tLogon
ID:\t\t0x1A1ADFE8\n\nObject:\n\tObject
\label{thm:name:thm:name} Name: \thm: \t
Name:\tpersist\n\tHandle ID:\t\t0x918\n\tOperation Type:\t\tNew registry value created\n\nProcess
Information:\n\tProcess ID:\t\t0x18f0\n\tProcess
Name: \t\tC:\<page-header> indows\system 32\\windows\space{2.000} Power Shell \v1.0\space{2.000} Power Shell \exe\n\n\constraints \space{2.000} Power Shell \space{2.0000} Power Shell \space{2.000} Power Shell \space{2.0000} Power Shell \space{2.0000} Power Shell
Value Type:\t\t-\n\tOld Value:\t\t-\n\tNew Value Type:\t\tREG_SZ\n\tNew Value:\t\tTrue",
                        "TaskCategory": "Registry",
                        "data_type": "WinEventLog:Security"
                   }
              ],
               "analytic": {
"LS0tCnRpdGx10iBSZWdpc3RyeSBSdW4gS2V5cwppZDogcmVnaXN0cnkgcGVyc2lzdGVuY2UKc3RhdHVz0iBleHBlcmltZW50YWwKZGVzY
3JpcHRpb246IERldGVjdHMgbmV3IHJ1Z2lzdHJ5IHJ1biBrZXkgY3J1YXR1ZCBldmVudC4KdGFnczoKLSBhdHRhY2sucGVyc2lzdGVuY2U
{\tt KLSBhdHRhY2sudDE1NDcKYXV0aG9y0iBkZW1vCmRhdGU6IDIwMjEvMDYvMDcKbG9nc291cmNlOgogIHByb2R1Y3Q6IHdpbmRvd3MKICBpb} \\
mRleDogbWFpbgogIGNhdGVnb3J50iByZWdpc3RyeV9ldmVudApkZXRlY3Rpb246CiAgc2VsZWN0aW9uOgogICAgRXZlbnRDb2Rl0iAnNDY
1NycKICAgIE9iamVjdF9OYW11fGNvbnRhaW5zOgogICAgLSBSdW4KICAgIC0gU2hlbGwgRm9sZGVycwogIGNvbmRpdG1vbjogc2VsZWN0a
W9uCmZhbHN1cG9zaXRpdmVzOgotIEhpZ2gKbGV2ZWw6IGhpZ2g="
                   "type": "Sigma Rule - base64 encoded YAML file"
               "extensions": {
                     extension-definition--c4690e13-107e-4796-8158-0dcf1ae7bc89": {
```

"extension_type": "new-sdo"





```
}
 }
},
  "type": "relationship",
  "spec_version": "2.1"
  "id": "relationship--3e3295b7-c616-4ee1-8210-002093589884",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "detects",
  "source_ref": "x-oca-detection--58834c29-4ceb-42a1-a218-336103021111",
  "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ab"
},
  "type": "relationship",
  "spec_version": "2.1"
  "id": "relationship--603e1426-49d7-42ea-a73a-263a963e6db0",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "detects",
  "source ref": "x-oca-detection--58834c29-4ceb-42a1-a218-336103021222",
  "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890bc"
},
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--6d65615b-b7f6-4169-9226-6b70509f8f38",
  "created": "2022-03-31T13:00:00.000Z"
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "detects",
  "source_ref": "x-oca-detection--458c02c9-3635-42e4-8873-6785e00517e7",
  "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890cc"
},
  "type": "x-oca-detection-group",
  "spec_version": "2.1",
  "id": "x-oca-detection-group--58834c29-4ceb-42a1-a218-321103021999",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "name": "Reaper Lite Detection",
  "description": "This detection group detects spearphishing, execution, and persistence",
  "correlation_workflows": [
      "type": "CACAO - base64 encoded JSON file",
      "note": "Decode base64 string and save as .json file",
      "workflow":
```

ewogICAgInR5cGUiOiAicGxheWJvb2siLAogICAgInNwZWNfdmVyc2lvbiI6ICIxLjEiLAogICAgImlkIjogInBsYXlib29rLS02MWRmN" jc5NS03ZjN1LTVmM2ItOTQwNC00ZjgyZTUxYWNjNjAiLAogICAgIm5hbWUiOiAiQ29ycmVsYXRlIGFuZCBTY29yZSBBbGVydCIsCiAgICA iY3JlYXRlZCI6ICIyMDIzLTA2LTIwVDE40jIwOjU0LjI1Mzk2MS0wNDowMCIsCiAgICAibW9kaWZpZWQi0iAiMjAyMy0wNi0yMFQxODoyM Do1NC4yNTM5NjEtMDQ6MDAiLAogICAgInJldm9rZWQi0iBmYWxzZSwKICAgICJwcmlvcml0eSI6IDAsCiAgICAic2V2ZXJpdHki0iAwLAo gICAgImltcGFjdCI6IDAsCiAgICAicGxheWJvb2tfdmFyaWFibGVzIjogewogICAgICAgICIkJGRpZF90aGF0X2V4ZV9vcl9kbGxfc3Bhd 25fYV9wcm9jZXNzX3RoYXRfbW9kZGVkX3J1Z21zdHJ5JCQi0iB7CiAgICAgICAgICAgICJ0eXB1IjogImludGVnZXIiLAogICAgICAgICA gICAiZGVzY3JpcHRpb24iOiAiRGlkIHRoYXQgRVhFIG9yIERMTCBzcGF3biBhIHByb2Nlc3MgdGhhdCBtb2RkZWQgUmVnaXN0cnk/IiwKI CAgICAgICAgICAgInZhbHVlljogIjAiLAogICAgICAgICAGICAiY29uc3RhbnQiOiBmYWxzZQogICAgICAgIH0sCiAgICAgICAgIiQkZGl kX3RoZV9ob3N0X3dpdGhfcHJpdl9lc2NhbGF0aW9uX3J1bl9kY3N5bmMkJCI6IHsKICAgICAgICAgICAgInR5cGUi0iAiaW50ZWdlciIsC iAgICAgICAgICAgICJkZXNjcmlwdGlvbiI6ICJEaWQgdGhlIGhvc3Qgd2l0aCBQcml2IEVzY2FsYXRpb24gcnVuIERDc3luYz8iLAogICA gICAgICAgICAidmFsdWUiOiAiMCIsCiAgICAgICAgICAgICJjb25zdGFudCI6IGZhbHNlCiAgICAgICAgfSwKICAgICAgICAiJCRkaWRfd GhlX29mZmljZV9wcm9jZXNzX2NyZWF0ZV9hb19leGVfb3JfZGxsJCQi0iB7CiAgICAgICAgICAgICJ0eXBlIjogImludGVnZXIiLAogICA gICAgICAgICAiZGVzY3JpcHRpb24i0iAiRGlkIHRoZSBPZmZpY2UgUHJvY2VzcyBDcmVhdGUgYW4gZXhlIG9yIERMTD8iLAogICAgICAgI CAgICAidmFsdWUiOiAiMCIsCiAgICAgICAgICAgICJjb25zdGFudCI6IGZhbHNlCiAgICAgICAgICAgICAgICAgICAjICRoYXNfaW50ZXJ uYWxfaG9zdF9iZWVuX2Fzc29jaWF0ZWRfd2l0aF9vdGhlcl9hbGVydHNfcmVjZW50bHkkJCI6IHsKICAgICAgICAgICAgICAgInR5cGUiOiAia W50ZWdlciIsCiAgICAgICAgICAgICJkZXNjcmlwdGlvbiI6ICJIYXMgSW50ZXJuYWwgaG9zdCBiZWVuIGFzc29jaWF0ZWQgd2l0aCBvdGh lciBhbGVydHMgcmVjZW50bHk/liwKICAgICAgICAgICAgInZhbHVlljogIjAiLAogICAgICAgICAgICAgICAiY29uc3RhbnQiOiBmYWxzZQogI CAgICAgIH0sCiAgICAgICAgICAgIQkaXNfZGVzdGluYXRpb25fd2hlcmVfZXhmaWxfb2NjdXJzJCQi0iB7CiAgICAgICAgICAgICJ0eXBlIjo gImludGVnZXIiLAogICAgICAgICAgICAiZGVzY3JpcHRpb24iOiAiSXMgRGVzdGluYXRpb24gd2hlcmUgRXhmaWwgb2NjdXJzPyIsCiAgI CAgICAgICAgICJ2YWx1ZSI6ICIwIiwKICAgICAgICAgICAgImNvbnN0YW50IjogZmFsc2UKICAgICAgICB9LAogICAgICAgICIkJGlzX2h vc3Rfb3JfdXNlc19hY2NvdW50X2Fzc29jaWF0ZWRfd210aF9vdGhlc19hbGVydHNfcmVjZW50bHkkJC16IHsK1CAgICAgICAgICAgInR5c GUiOiAiaW50ZWdlciIsCiAgICAgICAgICAgICJkZXNjcmlwdGlvbiI6ICJJcyBob3N0IG9yIFVzZXIgYWNjb3VudCBhc3NvY2lhdGVkIHd





pdGggb3RoZXIgYWxlcnRzIHJlY2VudGx5PyIsCiAgICAgICAgICAgICJ2YWx1ZSI6ICIwIiwKICAgICAgICAgICAgImNvbnN0YW50IjogZ mFsc2UKICAgICAgICB9LAogICAgICAgICIkJGlzX3RoZV9zb3VyY2Vfb2ZfbGF0ZXJhbF9tb3ZlbWVudF90aGVfaG9zdF9jb25kdWN0aW5 nX2RjX3N5bmMkJCI6IHsKICAgICAgICAgICAgInR5cGUi0iAiaW50ZWdlciIsCiAgICAgICAgICAgICJkZXNjcmlwdG1vbiI6ICJJcyB0aGUgc291cmNlIG9mIExhdGVyYWwgTW92ZW1lbnQgdGhlIEhvc3QgY29uZHVjdGluZyBEQyBTeW5jPyIsCiAgICAgICAgICAgICJ2YWx1ZSI 6ICIwIiwKICAgICAgICAgICAgImNvbnN0YW50IjogZmFsc2UKICAgICAgICB9LAogICAgICIkJGlzX3RoZV9zcGF3bmVkX3Byb2Nlc 3NfbmFtZV9kaWZmZXJlbnRfdGhhbl90aGVfb2ZmaWNlX2FwcF9mb3JfY3JlYXRlZF9wcm9jZXNzJCQi0iB7CiAgICAgICAgICAgICJ0eXB lIjogImludGVnZXIiLAogICAgICAgICAgICAiZGVzY3JpcHRpb24i0iAiSXMgdGhlIHNwYXduZWQgcHJvY2VzcyBuYW1lIGRpZmZlcmVud CB0aGFuIHRoZSBPZmZpY2UgQXBwIGZvciBDcmVhdGVkIFByb2Nlc3M/liwKICAgICAgICAgICAgInZhbHVlIjogIjAiLAogICAgICAgICA gICAiY29uc3RhbnQiOiBmYWxzZQogICAgICAgIH0sCiAgICAgICAgIiQkaXNfdGhlcmVfYW5fZW1haWxfdG9fd2ViX2FuZF93ZWJfdG9fb 2ZmaWNlX2FjdGl2aXR5X29uX2hvc3RfaW5fc2hvcnRfdGltZWZyYW1lJCQiOiB7CiAgICAgICAgICAgICJ0eXBlIjogImludGVnZXIiLAo gICAgICAgICAgICAiZGVzY3JpcHRpb24i0iAiSXMgdGhlcmUgYW4gRW1haWwgdG8gV2ViIGFuZCBXZWIgdG8gT2ZmaWNlIGFjdGl2aXR5I G9uIGhvc3QgaW4gc2hvcnQgdGltZWZyYW1lPyIsCiAgICAgICAgICAgICJ2YWx1ZSI6ICIwIiwKICAgICAgICAgICAgImNvbnN0YW50Ijo gZmFsc2UKICAgICAgICB9LAogICAgICAgICIkJHNldF9jb3JyZWxhdGlvbl9mb3JfYmVoYXZpb3Jfc2V0X2Jhc2VkX29uX3BvaW50X3Rhb ${\tt Gx5JCQiOiB7CiAgICAgICAgICAgICJ@eXBlIjogImludGVnZXIiLAogICAgICAgICAgICAiZGVzY3JpcHRpb24iOiAiU2V@IENvcnJlbGFileNchJlbG$ @aW9uIGZvciBCZWhhdmlvciBTZXQgYmFzZWQgb24gUG9pbnQgVGFsbHkiLAogICAgICAgICAgICAidmFsdWUiOiAiMCIsCiAgICAgICAgICAgI ${\tt CAgICJjb25zdGFudCI6IGZhbHNlCiAgICAgICAgICAgICAgICAgICAiJCR3YXNfcHJpd191c2NfZnJvbV9ub25ub3JtYWxfYWN0aXZpdHk} \\$ kJCI6IHsKICAgICAgICAgICAgInR5cGUi0iAiaW50ZWdlciIsCiAgICAgICAgICAgICJkZXNjcmlwdGlvbiI6ICJXYXMgUHJpdiBFc2MgZ nJvbSB0b24tTm9ybWFsIEFjdG12aXR5PyIsCiAgICAgICAgICAgICJ2YWx1ZSI6ICIwIiwKICAgICAgICAgICAgImNvbnN0YW50IjogZmF sc2UKICAgICAgICB9LAogICAgICAgICIkJHdhc19yZXF1ZXN0X2Zyb21fYWJub3JtYWxfdGltZXBsYWNlJCQi0iB7CiAgICAgICAgICAgI CJ0eXBlIjogImludGVnZXIiLAogICAgICAgICAgICAIZGVzY3JpcHRpb24i0iAiV2FzIHJlcXVlc3QgZnJvbSBhYm5vcm1hbCB0aW1lL3B CAgICIkJGNoZWNrX2FsZXJ0X3R5cGUkJCI6IHsKICAgICAgICAgICAgIR5cGUi0iAic3RyaW5nIiwKICAgICAgICAgICAgIMR1c2NyaXB @aW9uIjogIkFsZXJ@IHR5cGUgdGhhdCB@cmlnZ2VyZWQgdGhlIHBsYXlib29rIiwKICAgICAgICAgICAgImNvbnN@YW5@IjogdHJ1ZSwKI CAgICAgICAgICAgImV4dGVybmFsIjogdHJ1ZQogICAgICAgIH0KICAgIH0SCiAgICAid29ya2Zsb3dfc3RhcnQi0iAic3RlcC0tMmQ1NjE y MGM t NDR1 Yi 01 Nzhh L WE y YWY t NDNi 0W Nh Mj 11 Z WI 51 i w KI C Ag I C J 3 b 3 J r Z m x v d y I 6 I H s KI C Ag I C AgC01YzdkLWJiNmYtZDBiNzAzODg2NjgzIjogewogICAgICAgICAgICAidHlwZSI6ICJzaW5nbGUiLAogICAgICAgICAgICAibmFtZSI6ICJ RdWVyeSBBZ2FpbnN0IExhdGVyYWwgTW92ZW11bnQgQWxlcnRzIiwKICAgICAgICAgICAgIm9uX2NvbXBsZXRpb24i0iAic3RlcC0tYTM5M zhhYjUtNzQ4ZC01NGIzLThmNmEtMWZiZWI4ZGNlYzZkIiwKICAgICAgICAgICAgImNvbW1hbmRzIjogWwogICAgICAgICAgICAgICAgewo gICAgICAgICAgICAgICAgICAgICJ0eXBl1jogIm1hbnVhbCIsCiAgICAgICAgICAgICAgICAgICAgImNvbW1hbmQi0iAiUXVlcnkgQWdha W5zdCBMYXR1cmFsIE1vdmVtZW50IEFsZXJ0cyIsCiAgICAgICAgICAgICAgICAgICAgIMRlc2NyaXB0aW9uIjogIiIKICAgICAgICAgICA gICAgIH0KICAgICAgICAgICAgXQogICAgICAgIH0sCiAgICAgICAgInN0ZXAtLTA0NDk50DcwLTgw0DMtNTczYi04MTU5LTQyYjA5Yzcz0 Tk1ZCI6IHsKICAgICAgICAgICAgInR5cGUi0iAic2luZ2xlIiwKICAgICAgICAgICAgIm5hbWUi0iAiUXVlcnkgQWdhaW5zdCBFeGZpbCB BbGVydHMiLAogICAgICAgICAgICAib25fY29tcGxldGlvbiI6ICJzdGVwLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNLS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNlS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNlS1hMzkzOGFiNS03NDhkLTU0YjMtOGY2YS0xZmJlYjhkY2VjNlS1hZmzyNlS1hMzkzOGFiNS03NDhkZmyZndyNlS1hMzhyZndyNlS1hMzhyZndyNlS1hMzhyZndyNlS1hMzhyZndyNlS1hMzhyZndyNlS1hMzhyZndyNlS1hMzhyZndyNlS1hMzhyZndyNlS1hMzhyZndyNlS1hMzhyZndyNlS1hMzhyZndyNlS1hMzhyZndyNlS1hMzhyZ ${\tt mQiLAogICAgICAgICAgICAiY29tbWFuZHMiOiBbCiAgICAgICAgICAgICAgICB7CiAgICAgICAgICAgICAgICAgICAgICAgICAgInR5cGUiOiAibWF}$ udWFsIiwKICAgICAgICAgICAgICAgICAgICAiY29tbWFuZCI6ICJRdWVyeSBBZ2FpbnN0IEV4ZmlsIEFsZXJ0cyIsCiAgICAgICAgICAgI CAgICAgICAgImRlc2NyaXB0aW9uIjogIiIKICAgICAgICAgICAgICAgIH0KICAgICAgICAgICAgICAgICAgICAgICAgIH0sCiAgICAgICAgInN 0ZXAtLTA5NGEzNjY0LTkx0WEtNTlm0C05MjcxLWQ2YTUyZTA10TA00CI6IHsKICAgICAgICAgICAgInR5cGUi0iAiaWYtY29uZGl0aW9uI iwKICAgICAgICAgICAgIm5hbWUiOiAiV2FzIFByaXYgRXNjIGZyb20gTm9uLU5vcm1hbCBBY3Rpdm10eT8iLAogICAgICAgICAgICAiY29 uZG10aW9uIjogIiQkd2FzX3ByaXZfZXNjX2Zyb21fbm9ubm9ybWFsX2FjdG12aXR5JCQgPT0gMSIsCiAgICAgICAgICAgICJvb190cnV1IjogInN0ZXAtLWI5NDA1NTk3LWFiNzMtNWY2MC04NzVlLTk4NWRjNTI5ZTA0ZSIsCiAgICAgICAgICAGICJvbl9mYWxzZSI6ICJzdGVwLS0 zYTQ5NzhmYy05YmZhLTR1MjEtYjA4ZC1kN2RkYjVhYTFjYmUiLAogICAgICAgICAgICAiaW5fYXJncyI6IFsKICAgICAgICAgICAgICAgICAgI CIkJHdhc19wcml2X2VzY19mcm9tX25vbm5vcm1hbF9hY3Rpdml0eSQkIgogICAgICAgICAgICAgICAgICAgICAgfSwKICAgICAgICAic3R lcCOtMDllNThkYWMtYjZkYSO1OTRhLWE2ZjctMGQzZWIONjIwZGUxIjogewogICAgICAgICAgICAidHlwZSI6ICJzaW5nbGUiLAogICAgI CAgICAgICAibmFtZSI6ICJRdWVyeSBhZ2FpbnN0IFByaXZFc2MgQWxlcnRzIiwKICAgICAgICAgICAgIm9uX2NvbXBsZXRpb24i0iAic3R lcCOtNDY4YzljNjAtNjA5MS00ZTRmLWIwNDgtZjhiNjg2ZjVlYjBjIiwKICAgICAgICAgICAgImNvbW1hbmRzIjogWwogICAgICAgICAgI CAgICAgewogICAgICAgICAgICAgICAgICAgICJ0eXBl1jogIm1hbnVhbCIsCiAgICAgICAgICAgICAgICAgICAgICAGImNvbW1hbmQi0iAiUXV lcnkgYWdhaW5zdCBQcml2RXNjIEFsZXJ0cyIsCiAgICAgICAgICAgICAgICAgICAgImRlc2NyaXB0aW9uIjogIiIKICAgICAgICAgICAgI CAgIH0KICAgICAgICAgICAgXQogICAgICAgIH0SCiAgICAgICAgInN0ZXAtLTQ2OGM5YzYwLTYwOTEtNGU0Zi1iMDQ4LWY4YjY4NmY1ZWI wYy16IHsKICAgICAgICAgICAgICAgInR5cGUiOiAiaWYtY29uZGl0aW9uIiwKICAgICAgICAgICAgIm5hbWUiOiAiRGlkIHRoZSBob3N0IHdpd GggUHJpdiBFc2NhbGF0aW9uIHJ1biBEQ3N5bmM/IiwKICAgICAgICAgICAgIm9uX3RydWUiOiAic3RlcC0tYjRjM2NhNzUtMzY0ZS01ZWM 3LThmYTAtMzI5ZjFmMjIxMDI3IiwKICAgICAgICAgICAgIm9uX2ZhbHNlIjogInN0ZXAtLWMxZjNjZDcwLTEzNDMtNDEzYS1iMTNmLTJiM ThlYjc5MDE0ZSIsCiAgICAgICAgICAgICJpbl9hcmdzIjogWwogICAgICAgICAgICAgIiQkZGlkX3RoZV9ob3N0X3dpdGhfcHJpdl9 lc2NhbGF0aW9uX3J1b19kY3N5bmMkJCIKICAgICAgICAgICAgXSAgICAgICAgICAgIAogICAgIH0sCiAgICAgICAgICAgIN0ZXAtLTBhN 2EwNGYxLTU3MDItNThmYy1iYzY4LTUzZTV1NGQyYjU5NSI6IHsKICAgICAgICAgICAgInR5cGUi0iAiZW5kIiwKICAgICAgICAgICAgIm5 hbWUiOiAiRW5kIgogICAgICAgICAgIH0sCiAgICAgICAgICAgInN0ZXAtLTBjNjM2N2JiLTdhMTktNTZhYi1hNjEzLWJkZTU3MTBiYTBmOCI6IHsKI CAgICAgICAgICAgInR5cGUiOiAiaWYtY29uZG10aW9uIiwKICAgICAgICAgICAgIm5hbWUiOiAiRGlkIHRoYXQgRVhFIG9yIERMTCBzcGF 3biBhIHByb2Nlc3MgdGhhdCBtb2RkZWQgUmVnaXN0cnk/IiwKICAgICAgICAgICAgImNvbmRpdGlvbiI6ICIkJGRpZF90aGF0X2V4ZV9vc l9kbGxfc3Bhd25fYV9wcm9jZXNzX3RoYXRfbW9kZGVkX3JlZ2lzdHJ5JCQgPT0gMSIsCiAgICAgICAgICAgICJvbl90cnVlIjogInN0ZXA tLTdlZGQxMTQ4LTA1MDAtNWU1My1hN2V1LTNhOGM5NjEzNzk0YiIsCiAgICAgICAgICAgICJvbl9mYWxzZSI6ICJzdGVwLS04MWYzYjQxO ${\tt C05ZWE5LTU2M2Qt0Tk00C01NzdhY2FmYjQ10TEiLAogICAgICAgICAgICAiaW5fYXJncyI6IFsKICAgICAgICAgICAgICAgICIkJGRpZF9}$ 0aGF0X2V4ZV9vcl9kbGxfc3Bhd25fYV9wcm9jZXNzX3RoYXRfbW9kZGVkX3JlZ2lzdHJ5JCQiCiAgICAgICAgICAgIF0KICAgICAgICB9L AogICAgICAgICJzdGVwLS0wZDRmZDA0Ny0wZWYxLTVmMjctOGRiYi04YmUzMzZjYzQzMmMi0iB7CiAgICAgICAgICAgICJ0eXBlIjogInN pbmdsZSIsCiAgICAgICAgICAgICJuYW1lIjogIlF1ZXJ5IEFnYWluc3QgU3BlYXJwaGlzaCAyIEFsZXJ0cyIsCiAgICAgICAgICAgICJvb l9jb21wbGV0aW9uIjogInN0ZXAtLTEyMjc5ZmI3LTF1NTEtNTE0MS1hNmZkLWM2ODQyMGJiZTJhYyIsCiAgICAgICAgICAgICJjb21tYW5 kcy161FsK1CAg1CAg1CAg1CAg1CAg1HsK1CAg1CAg1CAg1CAg1CAg1CAidHlwZS161CJtYW51YWwiLAog1CAg1CAg1CAg1CAg1CAg1 CAgICJjb21tYW5kIjogIlF1ZXJ5IEFnYWluc3QgU3BlYXJwaGlzaCAyIEFsZXJ0cyIsCiAgICAgICAgICAgICAgICAgICAgICAICAYJAXB 0aW9uIjogIiIKICAgICAgICAgICAgICAgIH0KICAgICAgICAGICAgXQogICAgICAgIH0sCiAgICAgICAGINN0ZXAtLTExNjlhZmI4LTA5Y WUtNWU3MC04YWUwLTNjNGIzZWU0N2ViYi16IHsKICAgICAgICAgICAgInR5cGUi0iAic2luZ2xlliwKICAgICAgICAgICAgIM5hbWUi0iA





iUmVjb3JkIExhdCBNb3ZlIEx1ZCB0byBFeGZpbCAoQWRkIDEgUG9pbnQpIiwKICAgICAgICAgICAgIm9uX2NvbXBsZXRpb24i0iAic3Rlc C0tNWE5OTIzMzktMzdkYS01ZTN1LWJiOGYtNWUzYjA2YzM1ZjExIiwKICAgICAgICAgICAgImNvbW1hbmRzIjogWwogICAgICAgICAgICA gICAgewogICAgICAgICAgICAgICAgICAgICJ0eXBlIjogIm1hbnVhbCIsCiAgICAgICAgICAgICAgICAgICAgIMNvbW1hbmQi0iAiUmVjb 3JkIExhdCBNb3ZlIEx1ZCB0byBFeGZpbCAoQWRkIDEgUG9pbnQpIiwKICAgICAgICAgICAgICAgICAiZGVzY3JpcHRpb24i0iAiIgo gICAgICAgICAgICAgICAgfQogICAgICAgICAgICBdCiAgICAgICAgfSwKICAgICAgICAic3RlcC0tMTIyNzlmYjctMWU1MS01MTQxLWE2Z mQtYzY4NDIwYmJlMmFjIjogewogICAgICAgICAgICAidHlwZSI6ICJpZi1jb25kaXRpb24iLAogICAgICAgICAgICAibmFtZSI6ICJEaWQ gdGhlIE9mZmljZSBQcm9jZXNzIENyZWF0ZSBhbiBleGUgb3IgRExMPyIsCiAgICAgICAgICAgICJjb25kaXRpb24i0iAiJCRkaWRfdGhlX 29mZmljZV9wcm9jZXNzX2NyZWF0ZV9hbl9leGVfb3JfZGxsJCQgPT0gMSIsCiAgICAgICAgICAgICJvbl90cnVlIjogInN0ZXAtLWNjN2Y zNjUwLWM3MzEtNTcyMy05MmQ3LTk2ZTBkNWUyNzBmOSIsCiAgICAgICAgICAgICJvbl9mYWxzZSI6ICJzdGVwLS1jM2NiYmQ5ZC0zMzU4L TVmMGUtOTgwMC11NDg4YmUyNTMyZTMiLAogICAgICAgICAgICAiaW5fYXJncyI6IFsKICAgICAgICAgICAgICAGICAIkJGRpZF90aGVfb2Z maWN1X3Byb2N1c3NfY3J1YXR1X2FuX2V4ZV9vc19kbGwkJCIKICAgICAgICAgICAgXQogICAgICAgIH0sCiAgICAgICAgINN0ZXAtLTFh0 TllMDhkLTc2MjgtNTFiYy05NjZmLWI0MDU5YzM4NWI3OSI6IHsKICAgICAgICAgICAgInR5cGUi0iAiaWYtY29uZGl0aW9uIiwKICAgICA gICAgICAgIm5hbWUiOiAiV2FzIHJlcXVlc3QgZnJvbSBhYm5vcm1hbCB0aW11L3BsYWNlPyIsCiAgICAgICAgICAgICJjb25kaXRpb24iO iAiJCR3YXNfcmVxdWVzdF9mcm9tX2Fibm9ybWFsX3RpbWVwbGFjZSQkID09IDEiLAogICAgICAgICAgICAib25fdHJ1ZSI6ICJzdGVwLS1 jZmY2YzYxMC02NDkzLTU4OWYtYTIwZi01MGYyMDlmNjQ2MWQiLAogICAgICAgICAib25fZmFsc2Ui0iAic3RlcC0tYzhhM2QwODAtN TA1YS01MjliLTk3OWYtOTBiNGI3ZGRmMzBhIiwKICAgICAgICAgICAgIMluX2FyZ3MiOiBbCiAgICAgICAgICAgICAgICAGICA3YXNfcmV xdWVzdF9mcm9tX2Fibm9ybWFsX3RpbWVwbGFjZSQkIgogICAgICAgICAgICBdCiAgICAgICAgfSwKICAgICAgICAic3RlcC0tMjg3NGU5M jItYmJkMS01ZGY0LTlhNjEtZmYyMGZjNWU2MWM4IjogewogICAgICAgICAgICAidHlwZSI6ICJlbmQiLAogICAgICAgICAgICAibmFtZSI 6ICJFbmQiCiAgICAgICAgfSwKICAgICAgICAic3RlcCOtMjkwNDAwODgtYTZlZSO1Zjc5LTlkYTMtOWFiZWUXYZhhNGRiIjogewogICAgI CAgICAgICAidHlwZSI6ICJzaW5nbGUiLAogICAgICAgICAGICAibmFtZSI6ICJDb2xsZWN0IFRpbWUsIFByb2Nlc3MgTmFtZSwgUHJvY2V zcyBJRCwgSG9zdCIsCiAgICAgICAgICAgICJvbl9jb21wbGV0aW9uIjogInN0ZXAtLTc3YTZjYTZjLTY5MTctNTdlYy04MjA5LTAwYjA0Y mQ0NTEwZSIsCiAgICAgICAgICAgICJjb21tYW5kcyI6IFsKICAgICAgICAgICAgICAgIHsKICAgICAgICAgICAgICAgICAgICAidHlwZSI 6ICJtYW51YWwiLAogICAgICAgICAgICAgICAgICAgICJjb21tYW5kIjogIkNvbGxlY3QgVGltZSwgUHJvY2VzcyB0YW1lLCBQcm9jZXNzI ElELCBIb3N0IiwKICAgICAgICAgICAgICAgICAgICAiZGVzY3JpcHRpb24i0iAiIgogICAgICAgICAgICAgICAgfQogICAgICAgICAgICA CAidHlwZSI6ICJzaW5nbGUiLAogICAgICAgICAgICAibmFtZSI6ICJTZXQgQ29ycmVsYXRpb24gdG8gTG93IiwKICAgICAgICAgICAgIm9 uX2NvbXBsZXRpb24i0iAic3RlcC0tNmU0YTdiYWUtYjcxZC01M2ZhLTgwY2EtZTQ1N2VlYTgwYjZkIiwKICAgICAgICAgICAgImNvbW1hbgICAgImNvbW1hbmQiOiAiU2V0IENvcnJlbGF0aW9uIHRvIExvdyIsCiAgICAgICAgICAgICAgICAgICAgIMRlc2NyaXB0aW9uIjogIiIKI mLTQzYjljYTI5ZWViOSI6IHsKICAgICAgICAgICAgIRScGUiOiAic3RhcnQiLAogICAgICAgICAgICAibmFtZSI6ICJSZWNlaXZlIEFsZ XJ0IiwKICAgICAgICAgICAgIm9uX2NvbXBsZXRpb24i0iAic3RlcC0tZTlhYjY20DMt0TdlNy00NTVjLWFhNGUtZjkxNTNlYzFlNTQ4Igo gICAgICAgIH0sCiAgICAgICAgInN0ZXAtLWU5YWI2NjgzLTk3ZTctNDU1Yy1hYTR1LWY5MTUzZWMxZTU00CI6IHsKICAgICAgICAgICAgI nR5cGUiOiAic3dpdGNoLWNvbmRpdGlvbiIsCiAgICAgICAgICJuYW1lIjogIkNoZWNrIGFsZXJ0IHR5cGUiLAogICAgICAgICAGICA ic3dpdGNoIjogIiQkY2hlY2tfYWxlcnRfdHlwZSQkIiwKICAgICAgICAgICAgImNhc2VzIjogewogICAgICAgICAgICAgICAgIK9mZmljZ SBNYWNybyBTcGVhcnBoaXNoaW5nIDEi0iBbCiAgICAgICAgICAgICAgICAgInN0ZXAtLTc5ZDFhZjQ4LWUzZjYtNWIyYS1hNzcxLWV hNDkyMTY0NThmIgogICAgICAgICAgICAgICAgXSwKICAgICAgICAgICAgICAgICJPZmZpY2UgTWFjcm8gU3B1YXJwaG1zaGluZyAyIjogW wogICAgICAgICAgICAgICAgICAGICJzdGVwLS11MWU2YTlkNi05OTE2LTUzNWUtYTc5Mi04MzhmZmRhOTgxMTUiCiAgICAgICAgICAGICA gICBdLAogICAgICAgICAgICAgICAgICAgIX9mZmljZSBNYWNybyBFeGVjdXRpb24i0iBbCiAgICAgICAgICAgICAgICAgICAgICAgITN0ZXAtLTI5M gTW9kaWZpY2F0aW9uIjogWwogICAgICAgICAgICAgICAgICJzdGVwLS1kMDA3ZDcwZS03ZTUwLTVhOGItODdlZi1jNzY2OTV1OWU3Y jEiCiAgICAgICAgICAgICAgICAGICAGICAGICAGICAGICAGICAGIKJlYWNvbmluZyI6IFsKICAGICAGICAGICAGICAGICAGICACACACACAGICA tYzJiNmIyMDItOGVhYS01MzdiLWI4ZmItNTV1M2RjN2ViZDU2IgogICAgICAgICAgICAgICAgXSwKICAgICAgICAgICAgICAgICJQcml2a WxlZ2UgRXNjYWxhdGlvbiI6IFsKICAgICAgICAgICAgICAgICAGICAGICAGICAGIOgUyMmIwNjAtYjQ2OC01ZmU5LThjMmUtMDAzMjMyN2Z CAic3RlcCOtNTg1NThmMzEtZDBhNy01ZjRjLWE00WMtNjAxY2IzNDhiZGEzIgogICAgICAgICAgICAgICAgXSwKICAgICAgICAgICAgICA gICJMYXRlcmFsIE1vdmVtZW50IjogWwogICAgICAgICAgICAgICAgICJzdGVwLS0yZWU4N2QyNS04MmVhLTU3NWYtOTdlNS04MWFmO DB1YWI1ZDUiCiAgICAgICAgICAgICAgICBdLAogICAgICAgICAgICAgICAGIKRhdGEgRXhmaWx0cmF0aW9uIjogWwogICAgICAgICAGICA gICAgICAgICJzdGVwLS1lZjIzNWJjYS02YWJhLTUxODctOTJjYi00NDEwYzc30DRkZTMiCiAgICAgICAgICAgICAgICBdCiAgICAgICAgICAgI gICBdCiAgICAgICAgfSwKICAgICAgiCAic3RlcC0tMmU3YTFiMTYtMGNmMy01MWJkLTkxNTctNmE2YTU1ZGJjOWMwIjogewogICAgICAgI CAgICAidHlwZSI6ICJzaW5nbGUiLAogICAgICAgICAjCAibmFtZSI6ICJDcmVhdGUgY2FzZS9ub3RpZmljYXRpb24gdG8gaW52ZXN0aWd hdGUgUHJpdiBFc2MiLAogICAgICAgICAgICAib25fY29tcGxldGlvbiI6ICJzdGVwLS0wOTRhMzY2NC05MTlhLTU5ZjgtOTI3MS1kNmE1M iOiAiaHR0cC1hcGkiLAogICAgICAgICAgICAgICAgICAgICJjb21tYW5kIjogIkNyZWF0ZSBjYXNlL25vdGlmaWNhdGlvbiB0byBpbnZlc 3RpZ2F0ZSBQcml2IEVzYyIsCiAgICAgICAgICAgICAgICAgICAgImRlc2NyaXB0aW9uIjogIiIKICAgICAgICAgICAgICAgIH0KICAgICA gICAgICAgXQogICAgICAgIH0sCiAgICAgICAgInN0ZXAtLTJ1ZTg3ZDI1LTgyZWEtNTc1Zi05N2U1LTgxYWY4MGVhYjVkNSI6IHsKICAgI CAgICAgICAgInR5cGUiOiAic2luZ2xlIiwKICAgICAgICAgICAgIm5hbWUiOiAiQ29sbGVjdCB0aW1lLCBzb3VyY2UsIGFuZCBkZXN0aW5 hdGlvbiBmb3IgbW92ZW1lbnQiLAogICAgICAgICAgICAib25fY29tcGxldGlvbiI6ICJzdGVwLS03MGRhMTMz0C0yNTc1LTVmMzgtYjM30 gInR5cGUiOiAibWFudWFsIiwKICAgICAgICAgICAgICAgICAGICAiY29tbWFuZCI6ICJDb2xsZWN0IHRpbWUsIHNvdXJjZSwgYW5kIGRlc 3RpbmF0aW9uIGZvciBtb3ZlbWVudCIsCiAgICAgICAgICAgICAgICAgIMRlc2NyaXB0aW9uIjogIiIKICAgICAgICAgICAgICAgICAIH0 KICAgICAgICAgICAgXQogICAgICAgIH0sCiAgICAgICAgInN0ZXAtLTMwZmIwMmM0LThiNzUtNTI0YS1iNWJjLWU3YTQyZDhiY2NiOSI6I HsKICAgICAgICAgICAgInR5cGUiOiAiZW5kIiwKICAgICAgICAgICAgIm5hbWUiOiAiRW5kIgogICAgICAgIH0sCiAgICAgICAgInN0ZXA tLTM2OWNkMzZmLTU1N2ItNTI4MC1iZGZiLWJhZmU0ODUzY2IxYiI6IHsKICAgICAgICAgICAgInR5cGUi0iAic2luZ2xlIiwKICAgICAgI CAgICAgIm5hbWUiOiAiUXVlcnkgQWdhaW5zdCBMYXRlcmFsIE1vdmVtZW50IEFsZXJ0cyIsCiAgICAgICAgICAgICJvbl9jb21wbGV0aW9 uIjogInN0ZXAtLTY5NjQxMjU3LTkxZDEtNTMxNi1hYTllLTgzZmM1Y2E2YTJkNCIsCiAgICAgICAgICAgICJjb21tYW5kcyI6IFsKICAgI





kIjogIlF1ZXJ5IEFnYWluc3QgTGF0ZXJhbCBNb3ZlbWVudCBBbGVydHMiLAogICAgICAgICAgICAgICAgICAgICAKZNJcmlwdGlvbiI6I tYTUxMi1kNmNlZjZhOTYzNjgiOiB7CiAgICAgICAgICAgICJ0eXBlIjogInNpbmdsZSIsCiAgICAgICAgICAgICJuYW1lIjogIlB1bGwgV XNlciBJRCBhbmQgSGFzaGVzIGZyb20gcmVxdWVzdCIsCiAgICAgICAgICJvbl9jb21wbGV0aW9uIjogInN0ZXAtLTA5ZTU4ZGFjLWI 2ZGEtNTk0YS1hNmY3LTBkM2ViNDYyMGR1MSIsCiAgICAgICAgICAgICJjb21tYW5kcyI6IFsKICAgICAgICAgICAgICAgICAgICAgICAGICAGI CAgICAgICAgICAgICAidHlwZSI6ICJodHRwLWFwaSIsCiAgICAgICAgICAgICAgICAgICAgIMNvbW1hbmQi0iAiUHVsbCBVc2VyIE1EIGF uZCBIYXNoZXMgZnJvbSByZXF1ZXN0IiwKICAgICAgICAgICAgICAgICAICAGICAiCAiZGVzY3JpcHRpb24iOiAiIgogICAgICAgICAgICAgICAgf QogICAgICAgICAgICBdCiAgICAgICAgfSwKICAgICAgICAic3RlcC0tM2E0OTc4ZmMtOWJmYS00ZTIxLWIwOGQtZDdkZGI1YWExY2JlIjo gewogICAgICAgICAgICAidHlwZSI6ICJlbmQiLAogICAgICAgICAgICAibmFtZSI6ICJFbmQiCiAgICAgICAgfSwKICAgICAgICAic3Rlc C0tNDE3NDdjODktYTI5NS01NGY1LTk5NzUtM2V1ZjM0NjAxMzMxIjogewogICAgICAgICAgICAidHlwZSI6ICJwYXJhbGxlbCIsCiAgICA gICAgICAgICJuZXh0X3N0ZXBzIjogWwogICAgICAgICAgICAgICAGIN0ZXAtLTQ4NjEzMjViLTN1MDItNTA3Yi04MGI1LWFjY2IxZTQ2M TI3ZSIsCiAgICAgICAgICAgICAgICAic3RlcC0tNDFmMjJhZDctODZ1Yy01YTAwLThiNjQtZjM4M2Y2NzZjYmNkIgogICAgICAgICAgICB dCiAgICAgICAgfSwKICAgICAgICAic3RlcC0tNDFmMjJhZDctODZlYy01YTAwLThiNjQtZjM4M2Y2NzZjYmNkIjogewogICAgICAgICAgI CAidHlwZSI6ICJzaW5nbGUiLAogICAgICAgICAgICAibmFtZSI6ICJRdWVyeSBhZ2FpbnN0IE1hY3JvIEV4ZWN1dGlvbiBBbGVydHMiLAo gICAgICAgICAgICAib25fY29tcGxldGlvbiI6ICJzdGVwLS0xMjI3OWZiNy0xZTUxLTUxNDEtYTZmZC1jNjg0MjBiYmUyYWMiLAogICAgI gICAgICAgICAgICAgICAGICAiY29tbWFuZCI6ICJRdWVyeSBhZ2FpbnN0IE1hY3JvIEV4ZWN1dGlvbiBBbGVydHMiLAogICAgICAgICAGI CAgICAgICAgICJkZXNjcmlwdGlvbi16ICIiCiAgICAgICAgICAgICAgICB9CiAgICAgICAgICAgIF0KICAgICAgICAgICAgICAgICAgICA zdGVwLS00ODYxMzI1Yi0zZTAyLTUwN2ItODBiNS1hY2NiMWU0NjEyN2Ui0iB7CiAgICAgICAgICAgICJ0eXBlIjogInNpbmdsZSIsCiAgI CAgICAgICAgICJuYW11IjogIlF1ZXJ5IGFnYWluc3QgU3B1YXJwaGlzaCAxIEFsZXJ0cyIsCiAgICAgICAgICAgICJvbl9jb21wbGV0aW9 uIjogInN0ZXAtLWE5Mjdm0WM1LWQ5ZjctNWZ1NC04ZDQ4LTc5Zjh1MDA0ZWMzYiIsCiAgICAgICAgICAgICJjb21tYW5kcyI6IFsKICAgI CAgICAgICAgICAgIHsKICAgICAgICAgICAgICAgICAgICAidHlwZSI6ICJtYW51YWWiLAogICAgICAgICAgICAgICAgICAgICJjb21tYW5 kIjogIlF1ZXJ5IGFnYWluc3QgU3BlYXJwaGlzaCAxIEFsZXJ0cyIsCiAgICAgICAgICAgICAgICAgICAgIMRlc2NyaXB0aW9uIjogIiIKI CAgICAgICAgICAgICAGIH0KICAGICAGICAGICAGYQOGICAGICAGIH0SCIAGICAGICAGIN0ZXAtLTRmMThi0DIwLWM4Y2YtNWJmMS1iMDR jLTY5YTc2OWJiODNmOCI6IHsKICAgICAgICAgICAgInR5cGUiOiAiZW5kIiwKICAgICAgICAgICAgIm5hbWUiOiAiRW5kIgogICAgICAgI H0sCiAgICAgICAgInN0ZXAtLTUyNmNjYWExLThlZDgtNTg1Ni1iMWMxLWU0NDUwMDg4MTQzYyI6IHsKICAgICAgICAgICAgInR5cGUi0iA icGFyYWxsZWwiLAogICAgICAgICAgICAibmV4dF9zdGVwcyI6IFsKICAgICAgICAgICAgICAgICJzdGVwLS0wZDRmZDA0Ny0wZWYxLTVmM jctOGRiYi04YmUzMzZjYzQzMmMiLAogICAgICAgICAgICAgICAgInN0ZXAtLTg0ZDc2YWM3LWFiYWUtNTE5OS04YTN1LWVkNTYzMTM5Y2U 2YyIKICAgICAgICAgICAgXQogICAgICAgIH0sCiAgICAgICAgInN0ZXAtLTU4NTU4ZjMxLWQwYTctNWY0Yy1hNDljLTYwMWNiMzQ4YmRhM yI6IHsKICAgICAgICAgICAgICAGInR5cGUi0iAic2luZ2xlliwKICAgICAgICAgICAgIm5hbWUi0iAiQ29sbGVjdCBUaW1lLCBhY2NvdW50IHJ lcXVlc3Rpbmdcbkhvc3Qgc2VuZGluZywgdHJhZmZpYyB0byBEQ1xuKE11bHRpcGxlIExvZ3MpIiwKICAgICAgICAgICAgIm9uX2NvbXBsZ XRpb24i0iAic3RlcC0tMWE50WUwOGQtNzYyOC01MWJjLTk2NmYtYjQwNTljMzg1Yjc5IiwKICAgICAgICAgICAgImNvbW1hbmRzIjogWwo gICAgICAgICAgICAgICAgewogICAgICAgICAgICAgICAgICAGICJ0eXBlIjogIm1hbnVhbCIsCiAgICAgICAgICAgICAgICAgICAgImNVb $\label{thm:prop:main} W1hbmQiOiAiQ29sbGVjdCBUaW11LCBhY2NvdW50IHJ1cXV1c3Rpbmdcbkhvc3Qgc2VuZG1uZywgdHJhZmZpYyB0byBEQ1xuKE11bHRpcGx$ llExvZ3MpIiwKICAgICAgICAgICAgICAgICAgICAICAGICAiZGVzY3JpcHRpb24iOiAiIgogICAgICAgICAgICAgICAgICAgICAgICAgICAgICBdC iAgICAgICAgfSwKICAgICAgICAic3RlcC0tNThhMzlhYTktNTMzNC01NGZjLTg4NDItYTMwNGQ4Zjk1ZTA4IjogewogICAgICAgICAgICA idHlwZSI6ICJzaW5nbGUiLAogICAgICAgICAgICAibmFtZSI6ICJRdWVyeSBBZ2FpbnN0IG90aGVyIGFsZXJ0cyIsCiAgICAgICAgICAgI CJvbl9jb21wbGV0aW9uIjogInN0ZXAtLWMwMjA2NTk2LThlMTUtNTQ4OS1iMDA4LWUwMDUzOGJlZDE2OCIsCiAgICAgICAgICAgICJjb21 CAgICAgICJjb21tYW5kIjogIlF1ZXJ5IEFnYWluc3Qgb3RoZXIgYWxlcnRzIiwKICAgICAgICAgICAgICAgICAGICAiZGVzY3JpcHRpb24 iOiAiIgogICAgICAgICAgICAgICAgICAgICAgICAgICAgICBdCiAgICAgICAgICAgICAgICAgICAic3RlcC0tNWE5OTIzMzktMzdkYS01Z TNlLWJiOGYtNWUzYjA2YzM1ZjExIjogewogICAgICAgICAgICAidHlwZSI6ICJzaW5nbGUiLAogICAgICAgICAgICAibmFtZSI6ICJUYWx sesBQb21udHMilAogICAgICAgICAgICAib25fY29tcGxldGlvbiI6ICJzdGVwlS05NGUyYzBmMS01MTk1LTVkNTctOWJhMy1kOWNmYTU4YmYzZWMiLAogICAgICAgICAgICAiY29tbWFuZHMiOiBbCiAgICAgICAgICAgICAgICB7CiAgICAgICAgICAgICAgICAgICAgICAgICAGICAGICA XNjcmlwdGlvbi16ICIiCiAgICAgICAgICAgICAgICB9CiAgICAgICAgICAgIF0KICAgICB9LAogICB9LAogICAgICJzdGVwLS02MDRlZjh mMC0xNjc3LTU0Y2Mt0DBhMS1kMjk3ZWQ5YTU1N2Ii0iB7CiAgICAgICAgICAgICJ0eXBlIjogInBhcmFsbGVsIiwKICAgICAgICAgICAgI m5leHRfc3RlcHMi0iBbCiAgICAgICAgICAgICAgICAIc3RlcC0tMmU3YTFiMTYtMGNmMy01MWJkLTkxNTctNmE2YTU1ZGJjOWMwIiwKICA gICAgICAgICAgICAgICJzdGVwLS1kYjBlNzNmZS1hMmQzLTU4NjAtODJiZS0xMTNlMTcwMWI5MzkiCiAgICAgICAgICAgIF0KICAgICAgI CB9LAogICAgICAgICJzdGVwLS020TY0MTI1Ny05MWQxLTUzMTYtYWE5ZS04M2ZjNWNhNmEyZDQi0iB7CiAgICAgICAgICAgICJ0eXBlIjo gImlmLWNvbmRpdGlvbiIsCiAgICAgICAgICAgICJuYW1lIjogIklzIHRoZSBzb3VyY2Ugb2YgTGF0ZXJhbCBNb3ZlbWVudCB0aGUgSG9zd CBjb25kdWN0aW5nIERDIFN5bmM/IiwKICAgICAgICAgICAgImNvbmRpdGlvbiI6ICIkJGlzX3RoZV9zb3VyY2Vfb2ZfbGF0ZXJhbF9tb3Z lbwVudF90aGVfaG9zdF9jb25kdWN0aW5nX2RjX3N5bmMkJCA9PSAxIiwKICAgICAgICAgICAgIm9uX3RydWUiOiAic3RlcC0tZmUzMTZiM $\label{thm:ctzdg1Ny01N2ZilTkzY2UtYmUyZGM4MTQz0WUwIiwKICAgICAgICAgICAgIm9uX2ZhbHNlIjogInN0ZXAtLWFkMDVk0GYwLTZjYjQtNTN and the control of the$ iOS04NzdlLTBiZmRmYzNiMDFlMyIsCiAgICAgICAgICAgICJpbl9hcmdzIjogWwogICAgICAgICAgICAgICAgIiQkaXNfdGhlX3NvdXJjZ V9vZ19sYXR1cmFsX21vdmVtZW50X3RoZV9ob3N0X2NvbmR1Y3RpbmdfZGNfc3luYyQkIgogICAgICAgICAgICBdCiAgICAgICAgfSwKICA gICAgICAic3RlcC0tNmI4YWM1ZmQtNjc4ZC01MDBjLWE0ZDAtZWZjNjMzOWI10Dc5IjogewogICAgICAgICAgICAidHlwZSI6ICJpZi1jb 25kaXRpb24iLAogICAgICAgICAgICAibmFtZSI6ICJIYXMgSW50ZXJuYWwgaG9zdCBiZWVuIGFzc29jaWF0ZWQgd2l0aCBvdGhlciBhbGV ydHMgcmVjZW50bHk/IiwKICAgICAgICAgICAgIMNvbmRpdGlvbiI6ICIkJGhhc19pbnRlcm5hbF9ob3N0X2J1ZW5fYXNzb2NpYXR1ZF93a XRoX290aGVyX2FsZXJ0c19yZWNlbnRseSQkID09IDEiLAogICAgICAgICAib25fdHJ1ZSI6ICJzdGVwLS1hYTcwNjYxNC0wZTNmLTU 5ZGQtYTJiMS01YzA4MDAzZTIzMDMiLAogICAgICAgICAgICAib25fZmFsc2Ui0iAic3RlcC0tMGE3YTA0ZjEtNTcwMi010GZjLWJjNjgtN TN1NWU0ZDJiNTk1IiwKICAgICAgICAgICAgImluX2FyZ3Mi0iBbCiAgICAgICAgICAgICAGICAiJCRoYXNfaW50ZXJuYWxfaG9zdF9iZWV uX2Fzc29jaWF0ZWRfd2l0aF9vdGh1cl9hbGVydHNfcmVjZW50bHkkJCIKICAgICAgICAgICAgXQogICAgICAgIH0sCiAgICAgICAgInN0Z XAtLTZ1NGE3YmF1LWI3MWQtNTNmYS04MGNhLWU0NTd1ZWE4MGI2ZCI6IHsKICAgICAgICAgICAgIR5cGUi0iAic2luZ2x1IiwKICAgICA gICAgICAgIm5hbWUiOiAiR2VuZXJhdGUgQ29ycmVsYXRlZCBCZWhhdmlvciBOb3RpZmljYXRpb24iLAogICAgICAgICAgICAib25fY29tc GxldGlvbiI6ICJzdGVwLS00ZjE4YjgyMC1jOGNmLTViZjEtYjA0Yy02OWE3NjliYjgzZjgiLAogICAgICAgICAgICAiY29tbWFuZHMiOiB bCiAgICAgICAgICAgICAgICAGICAgICAgICAgICAgICAgICAgICAgICAGINR5cGUiOiAiaHR0cC1hcGkiLAogICAgICAgICAgICAgICAgICAgI CJjb21tYW5kIjogIkdlbmVyYXR1IENvcnJlbGF0ZWQgQmVoYXZpb3IgTm90aWZpY2F0aW9uIiwKICAgICAgICAgICAgICAgICAgICAiZGV





zY3JpcHRpb24i0iAiIgogICAgICAgICAgICAgICAgICAgICAgICAgICAgICBdCiAgICAgICAgfSwKICAgICAgICAic3RlcC0tNzBkYTEzM zgtMjU3NS01ZjM4LWIzNzgtMj12ZWJ1OTV1MjNkIjogewogICAgICAgICAgICAidHlwZSI6ICJwYXJhbGxlbCIsCiAgICAgICAgICAGICJ uZXh0X3N0ZXBzIjogWwogICAgICAgICAgICAgICAgInN0ZXAtLWVkNTcwYTBiLWYwZGQtNTU0MS05NDVjLTRlODk3ODAyMTk0ZCIsCiAgI CAgICAgICAgICAGICAIc3RlcC0tMDQ00Tk4NzAt0DA4My01NzNiLTgxNTktNDJiMDljNzM50TVkIgogICAgICAgICAGICBdCiAgICAGICA gfSwKICAgICAgICAic3RlcC0tNzEwZTF1NjktMjQ3NS01ZDY2LWEzODUtNWU2ZmMwNmQ2NTdlIjogewogICAgICAgICAgICAidHlwZSI6I CJzaW5nbGUiLAogICAgICAgICAgICAibmFtZSI6ICJSZWNvcmQgcG90ZW50aWFsIEV4ZmlsIChBZGQgMSBQb2ludCkiLAogICAgICAgICA gICAib25fY29tcGxldGlvbiI6ICJzdGVwLS01YTk5MjMzOS0zN2RhLTVlM2UtYmI4Zi01ZTNiMDZjMzVmMTEiLAogICAgICAgICAgICAiY 29tbWFuZHMiOiBbCiAgICAgICAgICAgICAgICB7CiAgICAgICAgICAgICAgICAgICAgINR5cGUiOiAibWFudWFsIiwKICAgICAgICAgICA gICAgICAgICAiY29tbWFuZCI6ICJSZWNvcmQgcG90ZW50aWFsIEV4ZmlsIChBZGQgMSBQb2ludCkiLAogICAgICAgICAgICAgICAgICAgI CJkZXNjcmlwdGlvbiI6ICIiCiAgICAgICAgICAgICB9CiAgICAgICAgIF0KICAgICAgICAgICB9LAogICAgICAgICJzdGVwLS03N2E 2Y2E2Yy02OTE3LTU3ZWMtODIwOS0wMGIwNGJkNDUxMGUi0iB7CiAgICAgICAgICAgICJ0eXBlIjogImlmLWNvbmRpdGlvbiIsCiAgICAgI CAgICAgICJuYW11IjogIklzIHRoZSBzcGF3bmVkIHByb2Nlc3MgbmFtZSBkaWZmZXJlbnQgdGhhbiB0aGUgT2ZmaWNlIEFwcCBmb3IgQ3J lyxRlzCBQcm9jZXNzPyIsCiAgICAgICAgICAgICJjb25kaXRpb24i0iAiJCRpc190aGVfc3Bhd25lZF9wcm9jZXNzX25hbWVfZGlmZmVyZ wLS05OWQzNDQ0Yy04ZjA3LTRhY2MtOTQ3NC1jNWU1ZDUxNDR1NTciLAogICAgICAgICAgICAib25fZmFsc2Ui0iAic3R1cC0tNzhkNTU4Y 2MtNTM1My01NTgxLTk5YmMtNDFkYjg3NjY5MGJjIiwKICAgICAgICAgICAgImluX2FyZ3MiOiBbCiAgICAgICAgICAgICAGICAiJCRpc19 @aGVfc3Bhd251ZF9wcm9jZXNzX25hbWVfZG1mZmVyZW50X3RoYW5fdGh1X29mZm1jZV9hcHBfZm9yX2NyZWF0ZWRfcHJvY2VzcyQkIgogI CAgICAgICAgICBdCiAgICAgICAgFSwKICAgICAgICAic3RlcCOtNzhkNTU4Y2MtNTM1My01NTgxLTk5YmMtNDFkYjg3NjY5MGJjIjogewo gICAgICAgICAGICAidHlwZSI6ICJlbmQiLAogICAgICAgICAGICAibmFtZSI6ICJFbmQiCiAgICAgICAgFSwKICAgICAgICAic3RlcC0tN zlkMWFmNDgtZTNmNi01YjJhLWE3NzEtZWE00TIxNjQ10GYxIjogewogICAgICAgICAgICAidHlwZSI6ICJzaW5nbGUiLAogICAgICAgICA gICAibmFtZSI6ICJDb2xsZWN0IChUaW1lLCBIb3N0LCBQcm9jZXNzIE1EKSBmb3IgV2ViIEJyb3dzZXIgY2FsbGVkIGZyb20gRW1haWwiL AogICAgICAgICAGICAib25fY29tcGxldGlvbiI6ICJzdGVwLS1mNGExZmZkYy02ZjA4LTVhYjItYmEzMC1mMTMxNDM00GQ5MmUiLAogICA gICAgICAgICAiY29tbWFuZHMiOiBbCiAgICAgICAgICAgICAgICB7CiAgICAgICAgICAgICAgICAgICAgICAgINR5cGUiOiAibWFudWFsIiwKI CAgICAgICAgICAgICAGICAGICAiY29tbWFuZCI6ICJDb2xsZWN0IChUaW11LCBIb3N0LCBQcm9jZXNzIE1EKSBmb3IgV2ViIEJyb3dzZXI gY2FsbGVkIGZyb20gRW1haWwiLAogICAgICAgICAgICAgICAgICAgICJkZXNjcmlwdGlvbiI6ICIiCiAgICAgICAgICAgICAgICB9CiAgI CAgICAgICAgIF0KICAgICAgICB9LAogICAgICAgICJzdGVwLS03ZWRkMTE0OC0wNTAwLTV1NTMtYTd1ZS0zYThjOTYxMzc5NGIiOiB7CiA gICAgICAgICAgICJ0eXBlIjogInNpbmdsZSIsCiAgICAgICAgICAgICJuYW1lIjogIlJlY29yZCBNYWNybyBzcGF3bmVkIHByb2Nlc3Mgd GhhdCBtb2RkZWQgUmVnIChBZGQgMSBwb2ludCkiLAogICAgICAgICAib25fY29tcGxldGlvbiI6ICJzdGVwLS01YTk5MjMzOS0zN2R hLTVlM2UtYmI4Zi01ZTNiMDZjMzVmMTEiLAogICAgICAgICAGICAiY29tbWFuZHMiOiBbCiAgICAgICAgICAgICAgICB7CiAgICAgICAgICAGI CAgICAgICAgICAgInR5cGUi0iAibWFudWFsIiwKICAgICAgICAgICAgICAgICAGICAGY29tbWFuZCI6ICJSZWNvcmQgTWFjcm8gc3Bhd25 lZCBwcm9jZXNzIHRoYXQgbW9kZGVkIFJlZyAoQWRkIDEgcG9pbnQpIiwKICAgICAgICAgICAgICAgICAgICAiZGVzY3JpcHRpb24iOiAiI gogICAgICAgICAgICAgICAgFQogICAgICAgICAgICBdCiAgICAgICAgFSwKICAgICAgICAic3RlcC0tODFmM2I0MTgtOWVhOS01NjNkLTk 5NDgtNTc3YWNhZmI0NTkxIjogewogICAgICAgICAgICAidHlwZSI6ICJlbmQiLAogICAgICAgICAgICAibmFtZSI6ICJFbmQiCiAgICAgI CAgfSwKICAgICAgICAic3RlcC0t0DRkNzZhYzctYWJhZS01MTk5LThhM2UtZWQ1NjMxMzljZTZjIjogewogICAgICAgICAidHlwZSI 6ICJzaW5nbGUiLAogICAgICAgICAgICAibmFtZSI6ICJSZWNvcmQgT2ZmaWNlIEFwcCBjcmVhdGluZyBFWEUgb3IgRExMwqBcbihBZGQgM SBQb2ludCkiLAogICAgICAgICAgICAib25fY29tcGxldGlvbiI6ICJzdGVwLS04YWRjNjE2ZS0wMWEzLTVjOWYtYTQ3ZS04YmE4OWU0MDA WFudWFsIiwKICAgICAgICAgICAgICAgICAiY29tbWFuZCI6ICJSZWNvcmQgT2ZmaWN1IEFwcCBjcmVhdG1uZyBFWEUgb3IgRExMwqB cbihBZGQgMSBQb2ludCkiLAogICAgICAgICAgICAgICAgICAgICJkZXNjcmlwdGlvbiI6ICIiCiAgICAgICAgICAgICAgICB9CiAgICAgI gICAgICAgICJ0eXBlIjogInNpbmdsZSIsCiAgICAgICAgICAGICJuYW1lIjogIkNvbGxlY3QgVGltZSwgSG9zdCwgUElELCB0ZXdfVmFsd WUILAOgICAgICAgICAGICAib25fY29tcGxldGlvbiI6ICJzdGVwLS1kMDA3ZDcwZS03ZTUwLTVhOGItODdlZi1jNzY2OTVlOWU3YjEiLAo gICAgICAgICAgICAiY29tbWFuZHMiOiBbCiAgICAgICAgICAgICAgICB7CiAgICAgICAgICAgICAgICAgICAgIRScGUiOiAibWFudWFsI iwKICAgICAgICAgICAgICAgICAgICAiY29tbWFuZCI6ICJDb2xsZWN0IFRpbWUsIEhvc3QsIFBJRCwgTmV3X1ZhbHVlIiwKICAgICAgICA gICAgICAgICAgICAIZGVzY3JpcHRpb24iOiAiIgogICAgICAgICAgICAgICAgICAgICAgICAgICAgICBdCiAgICAgICAgICAgICAgICAgI CAic3RlcCOtOGFkYzYxNmUtMDFhMy01YzlmLWE0N2UtOGJhODllNDAwMGU4IjogewogICAgICAgICAgICAidHlwZSI6ICJwYXJhbGxlbCI sCiAgICAgICAgICGICJuZXh0X3N0ZXBzIjogWwogICAgICAgICAgICAgICAGInN0ZXAtLWQ3Y2NkZTc4LWZlZjAtNWMzZS04MDYzLTRiO DEzYzk2ZTU5NyIsCiAgICAgICAgICAgICAgICAic3RlcC0tNWE5OTIzMzktMzdkYS01ZTNlLWJi0GYtNWUzYjA2YzM1ZjExIgogICAgICA gICAgICBdCiAgICAgfCAgfSwKICAgICAgiCAic3RlcC0tOGUyMmIwNjAtYjQ2OC01ZmU5LThjMmUtMDAzMjMyN2ZkYWQ0IjogewogICAgI CAgICAgICAidHlwZSI6ICJzaW5nbGUiLAogICAgICAgICAgICAibmFtZSI6ICJDb2xsZWN0IFRpbWUsIEhvc3QsIHRva2VuIGluZm8sIGF jY291bnQgaW5mbyIsCiAgICAgICAgICAgICJvbl9jb21wbGV0aW9uIjogInN0ZXAtLTYwNGVmOGYwLTE2NzctNTRjYy04MGExLWQy0TdlZ 6ICJtYW51YWwiLAogICAgICAgICAgICAgICAgICAgICJjb21tYW5kIjogIkNvbGxlY3QgVGltZSwgSG9zdCwgdG9rZW4gaW5mbywgYWNjb dCiAgICAgICAgfSwKICAgICAjCAic3RlcCOtOTRlMmMwZjEtNTE5NSO1ZDU3LTliYTMtZDljZmE1OGJmM2VjIjogewogICAgICAgICAgI CAidHlwZSI6ICJzd2l0Y2gtY29uZGl0aW9uIiwKICAgICAgICAgICAgIShbWUi0iAiU2V0IENvcnJlbGF0aW9uIGZvciBCZWhhdmlvciB TZXQgYmFzZWQgb24gUG9pbnQgVGFsbHkiLAogICAgICAgICAGICAic3dpdGNoIjogIiQkc2V0X2NvcnJlbGF0aW9uX2Zvcl9iZWhhdmlvc 19zZXRfYmFzZWRfb25fcG9pbnRfdGFsbHkkJCIsCiagICAgICAgICAgICJjYXNlcyI6IHsKICAgICAgICAgICAgICAGICJCRVRXRUVOIDA gQU5EIDMgUE9JT1RTIjogWwogICAgICAgICAgICAgICAgICAGICJzdGVwLS0yYzBiZmMzYS1iMDY5LTU4NjItYWE3YS01Yjg4MjJkNmEwZ jIiCiAgICAgICAgICAgICAgICBdLAogICAgICAgICAgICAgICAgIkJFVFdFRU4gMyBBTkQgOCBQT010VFMi0iBbCiAgICAgICAgICAGICA gICAgICAgINN0ZXAtLWQxNjVlM2U1LTE1NzctNTAwYi1iOTFlLTkwZjgwM2M5N2MzNCIKICAgICAgICAgICAgICAgIF0sCiAgICAgICAgICAgI CAgICAgICAiTU9SRSBUSEF0IDggUE9JTlRTIjogWwogICAgICAgICAgICAgICAgICAgICJzdGVwLS1mM2ViMWYxZC1lNTU3LTVjZmItYmR lOC0zZTRhNTQ3YTI1MGEiCiAgICAgICAgICAgICAgICBdCiAgICAgICAgICAgIH0sCiAgICAgICAgICAGICJpbl9hcmdzIjogWwogICAgI CAgICAgICAgICAgIiQkc2V0X2NvcnJlbGF0aW9uX2Zvcl9iZWhhdmlvcl9zZXRfYmFzZWRfb25fcG9pbnRfdGFsbHkkJCIKICAgICAgICA gICAgXQogICAgICAgIH0sCiAgICAgICAgInN0ZXAtLTk5ZDM0NDRjLThmMDctNGFjYy05NDc0LWM1ZTVkNTE0NGU1NyI6IHsKICAgICAgI CAgICAgInR5cGUiOiAiZW5kIiwKICAgICAgICAgICAgIm5hbWUiOiAiRW5kIgogICAgICAgIH0sCiAgICAgICAgInN0ZXAtLWEzOTM4YWI 1LTc00GQtNTRiMy04ZjZhLTFmYmViOGRjZWM2ZCI6IHsKICAgICAgICAgICAgInR5cGUi0iAiaWYtY29uZGl0aW9uIiwKICAgICAgICAgI CAgIm5hbWUiOiAiSXMgRGVzdGluYXRpb24gd2hlcmUgRXhmaWwgb2NjdXJzPyIsCiAgICAgICAgICAgICJjb25kaXRpb24iOiAiJCRpc19





kZXN0aW5hdGlvbl93aGVyZV9leGZpbF9vY2N1cnMkJCA9PSAxIiwKICAgICAgICAgICAgIm9uX3RydWUiOiAic3RlcC0tMTE2OWFmYjgtM DlhZS01ZTcwLThhZTAtM2M0YjNlZTQ3ZWJiIiwKICAgICAgICAgICAgIm9uX2ZhbHNlIjogInN0ZXAtLWYyYjRlMmMwLWE0MjMtNWFkNi1 iMzllLTU5N2RkY2I2ZDFhMCIsCiAgICAgICAgICAgICJpbl9hcmdzIjogWwogICAgICAgICAgICAgICAgIiQkaXNfZGVzdGluYXRpb25fd 2hlcmVfZXhmaWxfb2NjdXJzJCQiCiAgICAgICAgICAgIF0KICAgICAGICB9LAogICAgICAgICJzdGVwLS1hOTI3ZjljNS1kOWY3LTVmZTQ tOGQ0OC03OWY4ZTAwNGVjM2IiOiB7CiAgICAgICAgICAgICJ0eXBlIjogImlmLWNvbmRpdGlvbiIsCiAgICAgICAgICAgICJuYW11IjogI klzIHRoZXJlIGFuIEVtYWlsIHRvIFdlYiBhbmQgV2ViIHRvIE9mZmljZSBhY3Rpdml0eSBvbiBob3N0IGluIHNob3J0IHRpbWVmcmFtZT8 iLAogICAgICAgICAiY29uZGl0aW9uIjogIiQkaXNfdGhlcmVfYW5fZW1haWxfdG9fd2ViX2FuZF93ZWJfdG9fb2ZmaWNlX2FjdGl2a XR5X29uX2hvc3RfaW5fc2hvcnRfdGltZWZyYW11JCQgPT0gMSIsCiAgICAgICAgICAgICJvbl90cnV1IjogInN0ZXAtLWF1ZjFjOWU3LWU wMWItNWYxMy1hYmU5LTU3NDczMDZkN2U0NSISCiAgICAgICAgICJvbl9mYWxzZSI6ICJzdGVwLS0y0Dc0ZTkyMi1iYmQxLTVkZjQt0 ${\tt WE2MS1mZjIwZmM1ZTYxYzgiLAogICAgICAgICAgICAgICAiaW5fYXJncyI6IFsKICAgICAgICAgICAgICAgICIkJG1zX3RoZXJ1X2FuX2VtYW12} \\$ sX3RvX3dlY19hbmRfd2ViX3RvX29mZmljZV9hY3Rpdml0eV9vbl9ob3N0X2luX3Nob3J0X3RpbWVmcmFtZSQkIgogICAgICAgICAgICBdC iAgICAgICAgfSwKICAgICAgICAic3RlcC0tYTkyYTNlZmQtNzUxOS01NjI1LWIzMTktMjcyNjdiYzY20DdkIjogewogICAgICAgICAgICA idHlwZSI6ICJwYXJhbGxlbCIsCiAgICAgICAgICAgICJuZXh0X3N0ZXBzIjogWwogICAgICAgICAgICAgICAGIN0ZXAtLWU5MTRhMTczL TBhYmYtNWI0YS1iODA2LTk4NjdkMWYwNzkwYiIsCiAgICAgICAgICAgICAGICAic3RlcCOtZGZiNWFlMTctOWRmYy01OTFjLWEyZWUtMmR kN2NkMzc3ZDQwIgogICAgICAgICAgICBdCiAgICAgICAgfSwKICAgICAgICAic3RlcC0tYWE3MDY2MTQtMGUzZi010WRkLWEyYjEtNWMw0 nIEFzc29jaWF0ZWQgd2l0aCBvdGhlciBiZWhhdmlvcnMgKGFkZCAxIHBvaW50KSIsCiAgICAgICAgICAgICJvbl9jb21wbGV0aW9uIjogI nN0ZXAtLTVhOTkyMzM5LTM3ZGEtNWUzZS1iYjhmLTVlM2IwNmMzNWYxMSIsCiAgICAgICAgICAgICJjb21tYW5kcyI6IFsKICAgICAgICA gICAgICAgIHsKICAgICAgICAgICAgICAgICAgICAidHlwZSI6ICJtYW51YWwiLAogICAgICAgICAgICAgICAgICAgICJjb21tYW5kIjogI lJ1Y29yZCBCZWFjb25pbmcgQXNzb2NpYXR1ZCB3aXRoIG90aGVyIGJ1aGF2aW9ycyAoYWRkIDEgcG9pbnQpIiwKICAgICAgICAgICAgICA gICAgICAiZGVzY3JpcHRpb24iOiAiIgogICAgICAgICAgICAgICAgfQogICAgICAgICAgICBdCiAgICAgICAgfSwKICAgICAgICAic3Rlc C0tYWQwNWQ4ZjAtNmNiNC01M2I5LTg3N2UtMGJmZGZjM2IwMWUZIjogewogICAgICAgICAgICAidHlwZSI6ICJlbmQiLAogICAgICAgICA gICAibmFtZSI6ICJFbmQiCiAgICAgICAgfSwKICAgICAgICAic3RlcC0tYWVmMWM5ZTctZTAxYi01ZjEzLWFiZTktNTc0NzMwNmQ3ZTQ1I jogewogICAgICAgICAgICAidHlwZSI6ICJzaW5nbGUiLAogICAgICAgICAgICAibmFtZSI6ICJSZWNvcmQgYSBwb3RlbnRpYWwgTWFjcm8 gU3B1YXJQaG1zaCBkZXR1Y3Rpb24gKEFkZCAxIHBvaW50PykiLAogICAgICAgICAgICAib25fY29tcGxldG1vbiI6ICJzdGVwLS01YTk5M jMzOS0zN2RhLTVlM2UtYmI4Zi01ZTNiMDZjMzVmMTEiLAogICAgICAgICAGICAiY29tbWFuZHMi0iBbCiAgICAgICAgICAGICAGICAGICACAA gICAgICAgICAgICAgICAgICAgInR5cGUiOiAibWFudWFsIiwKICAgICAgICAgICAgICAgICAgICAiY29tbWFuZCI6ICJSZWNvcmQgYSBwb 3RlbnRpYWwgTWFjcm8gU3BlYXJQaGlzaCBkZXRlY3Rpb24gKEFkZCAxIHBvaW50PykiLAogICAgICAgICAgICAgICAgICAgICJkZXNjcml wdGlvbi16ICIiCiAgICAgICAgICAgICAgICB9CiAgICAgICAgICAgICAgICAgICB9LAogICB9LAogICAgICJzdGVwLS1iNGMzY2E3NS0zNLS1iNGMzY2E3NS0ZNLS1iNGMzY2NS0ZNLS1iNGMzYNS0ZNLS1iNGMzYNS0ZNLS1iNGMzYNS0ZNLS1iNGMzYNS0ZNLS1iNGMzYNS0ZNLS1iNGMzYNS0ZNLS1iNGMzYNS0ZNLS1iNGMzYNS0ZNjRlLTVlYzctOGZhMC0zMjlmMWYyMjEwMjciOiB7CiAgICAgICAgICAJCOeXBlIjogInNpbmdsZSIsCiAgICAgICAgICAJCUYW1lIjo gIlJlY29yZCBQcml2RXNjIEFjY291bnQgYWNjZXNzaW5nIEhhc2hlcyAoYWRkIDEgcG9pbnQpIiwKICAgICAgICAgICAgIM9uX2NvbXBsZ XRpb24iOiAic3RlcC0tNWE5OTIzMzktMzdkYS01ZTN1LWJiOGYtNWUzYjA2YzM1ZjExIiwKICAgICAgICAgICAgImNvbW1hbmRzIjogWwo gICAgICAgICAgICAgICAgewogICAgICAgICAgICAgICAgICAGICJ0eXBlIjogIm1hbnVhbCIsCiAgICAgICAgICAgICAgICAgICAgIMNVb W1hbmQiOiAiUmVjb3JkIFByaXZFc2MgQWNjb3VudCBhY2Nlc3NpbmcgSGFzaGVzIChhZGQgMSBwb2ludCkiLAogICAgICAgICAgICAgICA gICAgICJkZXNjcmlwdGlvbiI6ICIiCiAgICAgICAgICAgICBgCiAgICAgICAgICAgICAgIF0KICAgICAgICB9LAogICAgICAgICJzdGVwL S1iOTQwNTU5Ny1hYjczLTVmNjAtODc1ZS05ODVkYzUyOWUwNGUiOiB7CiAgICAgICAgICAgICJ0eXBlIjogInNpbmdsZSIsCiAgICAgICA gICAgICJuYW11IjogIlJlY29yZCBBYm5vcm1hbCBQcml2IEVzYyAoQWRkIDEgUG9pbnQpIiwKICAgICAgICAgICAgIM9uX2NvbXBsZXRpb 24iOiAic3RlcC0tNWE5OTIzMzktMzdkYS01ZTNlLWJiOGYtNWUzYjA2YzM1ZjExIiwKICAgICAgICAgICAgImNvbW1hbmRzIjogWwogICA mQiOiAiUmVjb3JkIEFibm9ybWFsIFByaXYgRXNjIChBZGQgMSBQb2ludCkiLAogICAgICAgICAgICAgICAgICAgICJkZXNjcmlwdGlvbiI 6ICIiCiAgICAgICAgICAgICAgICB9CiAgICAgICAgICAgIF0KICAgICAgICB9LAogICAgICAgICJzdGVwLS1jMDIwNjU5Ni04ZTE1LTU00 DktYjAwOC11MDA1MzhiZWQxNjgiOiB7CiAgICAgICAgICAgICJ0eXBlIjogImlmLWNvbmRpdGlvbiIsCiAgICAgICAgICAgICJuYW1lIjo gIklzIGhvc3Qgb3IgVXNlciBhY2NvdW50IGFzc29jaWF0ZWQgd2l0aCBvdGhlciBhbGVydHMgcmVjZW50bHk/IiwKICAgICAgICAgICAgI mNvbmRpdGlvbiI6ICIkJGlzX2hvc3Rfb3JfdXNlcl9hY2NvdW50X2Fzc29jaWF0ZWRfd2l0aF9vdGhlcl9hbGVydHNfcmVjZW50bHkkJCA 9PSAxIiwKICAgICAgICAgICAgIm9uX3RydWUiOiAic3RlcCOtYzcwOTJmMTktMWRkOSO1ZDczLWFinjMtZTRlZWU3ODQ0YWRhIiwKICAgI CAgICAgICAgIm9uX2ZhbHNlljogInN0ZXAtLTMwZmIwMmM0LThiNzUtNTI0YS1iNWJjLWU3YTQyZDhiY2NiOSIsCiAgICAgICAgICAGICA pbl9hcmdzIjogWwogICAgICAgICAgICAgICAgIiQkaXNfaG9zdF9vcl91c2VyX2FjY291bnRfYXNzb2NpYXR1ZF93aXRoX290aGVyX2FsZ XJ0c19yZWNlbnRseSQkIgogICAgICAgICAgICAgICAgICAgICAgFSwKICAgICAGICAic3RlcC0tYzFmM2NkNzAtMTM0My00MTNhLWIxM2Y tMmIxOGViNzkwMTRlIjogewogICAgICAgICAgICAidHlwZSI6ICJlbmQiLAogICAgICAgICAgICAibmFtZSI6ICJFbmQiCiAgICAgICAgF SwKICAgICAgICAic3RlcC0tYzJiNmIyMDItOGVhYS01MzdiLWI4ZmItNTVlM2RjN2ViZDU2IjogewogICAgICAgICAgICAidHlwZSI6ICJ CAgICAib25fY29tcGxldGlvbiI6ICJzdGVwLS1hOTJhM2VmZC03NTE5LTU2MjUtYjMxOS0yNzI2N2JjNjY4N2QiLAogICAgICAgICAGICA iY29tbWFuZHMiOiBbCiAgICAgICAgICAgICAgICB7CiAgICAgICAgICAgICAgICAgICAgInR5cGUiOiAibWFudWFsIiwKICAgICAgICAgI CAgICAgICAgICAiY29tbWFuZCI6ICJDb2xsZWN0IEludGVybmFsIGFuZCBFeHRlcm5hbCBIb3N0IEluZm8iLAogICAgICAgICAgICAGICA gICAgICJkZXNjcmlwdGlvbiI6ICIiCiAgICAgICAgICAgICBgCiAgICAgICAgICAgICAgIF0KICAgICAgICB9LAogICAgICAgICJzdGVwL S1jM2NiYmQ5ZC0zMzU4LTVmMGUtOTgwMC1lNDg4YmUyNTMyZTMiOiB7CiAgICAgICAgICAgICJ0eXBlIjogImVuZCIsCiAgICAgICAgICA gICJuYW11IjogIkVuZCIKICAgICAgICB9LAogICAgICAgICJzdGVwLS1jNzA5MmYxOS0xZGQ5LTVkNzMtYWI2My11NGVlZTc4NDRhZGEiO iB7CiAgICAgICAgICAgCJ0eXBlIjogInNpbmdsZSIsCiAgICAgICAgICJuYW1lIjogIlJlY29yZCBFeGZpbCBhc3NvY2lhdGVkIHd pdGggb3RoZXIgYWN0aXZpdHkgKEFkZCAxIHBvaW50KSIsCiAgICAgICAgICAgICJvbl9jb21wbGV0aW9uIjogInN0ZXAtLTVhOTkyMzM5L TM3ZGEtNWUzZS1iYjhmLTVlM2IwNmMzNWYxMSIsCiAgICAgICAgICAJib21tYW5kcyI6IFsKICAgICAgICAgICAgICAgIHsKICAGICA gICAgICAgICAgICAGICAidHlwZSI6ICJtYW51YWwiLAogICAgICAgICAgICAgICAgICAJib21tYW5kIjogIlJlY29yZCBFeGZpbCBhc 3NvY2lhdGVkIHdpdGggb3RoZXIgYWN0aXZpdHkgKEFkZCAxIHBvaW50KSIsCiAgICAgICAgICAgICAgICAgICAgIMRlc2NyaXB0aW9uIjo gIiIKICAgICAgICAgICAgICAgIH0KICAgICAgICAgXQogICAgICAgIH0sCiAgICAgICAgIN0ZXAtLWM4YTNkMDgwLTUwNWEtNTI5Y i05NzlmLTkwYjRiN2RkZjMwYS16IHsKICAgICAgICAgICAgInR5cGUi0iAiZW5kIiwKICAgICAgICAgICAgIM5hbWUi0iAiRW5kIgogICA gICAgIH0sCiAgICAgICAgInN0ZXAtLWNhMGFiMTBlLThjM2MtNTgyYS1iNTdiLTdlOWZIZjllZGI0NSI6IHsKICAgICAgICAgICAgInR5c GUiOiAic2luZ2xlIiwKICAgICAgICAgICAgIm5hbWUiOiAiUXVlcnkgQWdhaW5zdCBNYWNybyBFeGVjdXRpb24gQWxlcnQiLAogICAgICA gICAgICAib25fY29tcGxldGlvbiI6ICJzdGVwLS0wYzYzNjdiYi03YTE5LTU2YWItYTYxMY1iZGU1NzEwYmEwZjgiLAogICAgICAgICAgI





gICAgICAgICAgICAiY29tbWFuZCI6ICJRdWVyeSBBZ2FpbnN0IE1hY3JvIEV4ZWN1dGlvbiBBbGVydCIsCiAgICAgICAgICAgICAgICAgICAgI CAgImRlc2NyaXB0aW9uIjogIiIKICAgICAgICAgICAgICAgIH0KICAgICAgICAgICAgXQogICAgICAgIH0sCiAgICAgICAgIN0ZXAtLWN jN2YzNjUwLWM3MzEtNTcyMy05MmQ3LTk2ZTBkNWUyNzBmOSI6IHsKICAgICAgICAgICAgInR5cGUiOiAic2luZ2xlIiwKICAgICAgICAgI CAgIm5hbWUiOiAiUmVjb3JkIERvd25sb2FkZWQgRmlsZSBDcmVhdGluZyBFeGUgKEFkZCAxIFBvaW50KSIsCiAgICAgICAgICAgICJvbl9 jb21wbGV0aW9uIjogInN0ZXAtLTVhOTkyMzM5LTM3ZGEtNWUzZS1iYjhmLTV1M2IwNmMzNWYxMSIsCiAgICAgICAgICAgICJjb21tYW5kc gICJjb21tYW5kIjogIlJlY29yZCBEb3dubG9hZGVkIEZpbGUgQ3JlYXRpbmcgRXhlIChBZGQgMSBQb2ludCkiLAogICAgICAgICAgICAgI CAgICAgICJkZXNjcmlwdGlvbiI6ICIiCiAgICAgICAgICAgICAgICB9CiAgICAgICAgICAgIF0KICAgICB9LAogICB9LAogICAgICJzdGV CAgICAgICAgIm5leHRfc3RlcHMi0iBbCiAgICAgICAgICAgICAgICAic3RlcC0tZmM10GRkMmItZTkzMi01NzE0LTg3ZTEtZjBjYzQ5OTN iMDQ1IiwKICAgICAgICAgICAgICJzdGVwLS0z0GZlZDJl0C0yZGZmLTUxYjktYTUxMi1kNmNlZjZhOTYzNjgiLAogICAgICAgICAgI CAgICAgInN0ZXAtLTM2OWNkMzZmLTU1N2ItNTI4MC1iZGZiLWJhZmU0ODUzY2IxYiIKICAgICAgICAgICAgXQogICAgICAgIH0sCiAgICA gICAgInN0ZXAtLWQwMDdkNzBlLTdlNTAtNWE4Yi04N2VmLWM3NjY5NWU5ZTdiMSI6IHsKICAgICAgICAgICAgInR5cGUi0iAic2luZ2xlI iwKICAgICAgICAgICAgIm5hbWUiOiAiU2VhcmNoIGZvciBQSUQgdGhhdCBjcmVhdGVkIHRoaXMgcHJvY2VzcyIsCiAgICAgICAgICAgICJ vbl9jb21wbGV0aW9uIjogInN0ZXAtLWNhMGFiMTBlLThjM2MtNTgyYS1iNTdiLTdlOWZlZjllZGI0NSIsCiAgICAgICAgICAgICJjb21tY gICAgICAgImNvbW1hbmQiOiAiU2VhcmNoIGZvciBQSUQgdGhhdCBjcmVhdGVkIHRoaXMgcHJvY2VzcyIsCiAgICAgICAgICAgICAgICAgICAgI CAgImRlc2NyaXB0aW9uIjogIiIKICAgICAgICAgICAgICAgIH0KICAgICAgICAgICAgICAgXQogICAgICAgIH0sCiAgICAgICAgINN0ZXAtLWQ xNjVlM2U1LTE1NzctNTAwYi1iOTF1LTkwZjgwM2M5N2MzNCI6IHsKICAgICAgICAgICAgInR5cGUi0iAic2luZ2xlIiwKICAgICAgICAgI CAgIm5hbWUiOiAiU2V0IENvcnJlbGF0aW9uIHRvIE1lZGl1bSIsCiAgICAgICAgICAgICJvbl9jb21wbGV0aW9uIjogInN0ZXAtLTZlNGE 3YmF1LWI3MWQtNTNmYS04MGNhLWU0NTd1ZWE4MGI2ZCIsCiAgICAgICAgICAgICJjb21tYW5kcyI6IFsKICAgICAgICAgICAgICAGIHsKI CAgICAgICAgICAgICAGICAGICAidHlwZSI6ICJtYW51YWwiLAogICAgICAGICAGICAGICAGICAGICJjb21tYW5kIjogIlNldCBDb3JyZWx hdGlvbiB0byBNZWRpdW0iLAogICAgICAgICAgICAgICAgICAgICJkZXNjcmlwdGlvbiI6ICIiCiAgICAgICAgICAgICAgICB9CiAgICAgI CAgICAgIF0KICAgICAgICB9LAogICAgICAgICJzdGVwLS1kN2NjZGU3OC1mZWYwLTVjM2Ut0DA2My00YjgxM2M5NmU1OTci0iB7CiAgICA ${\tt gICAgICAgICJ0eXB1IjogInNpbmdsZSIsCiAgICAgICAgICAgICJuYW11IjogIlF1ZXJ5IGFnYWluc3QgUmVnaXN0cnkgTW9kIEFsZXJ0II} \\$ iwKICAgICAgICAgICAgIm9uX2NvbXBsZXRpb24iOiAic3RlcC0tMGM2MzY3YmItN2ExOS01NmFiLWE2MTMtYmRlNTcxMGJhMGY4IiwKICA ${\tt gICAgICAgICAgImNvbW1hbmRzIjogWwogICAgICAgICAgICAgICAgewogICAgICAgICAgICAgICAgICAgICJ0eXBlIjogIm1hbnVhbCIsC}$ iAgICAgICAgICAgICAgICAgICAgIMNvbW1hbmQiOiAiUXVlcnkgYWdhaW5zdCBSZWdpc3RyeSBNb2QgQWxlcnQiLAogICAgICAgICAgICA gICAgICAgICJkZXNjcmlwdGlvbiI6ICIiCiAgICAgICAgICAgICAgICB9CiAgICAgICAgIF0KICAgICAgICB9LAogICAgICAgICJzd gICAgICAgICJuYW11IjogIlF1ZXJ5IEFnYWluc3QgRENTeW5jIEFsZXJ0cyIsCiAgICAgICAgICAgICJvbl9jb21wbGV0aW9uIjogInN0Z XAtLTQ2OGM5YzYwLTYwOTEtNGU0Zi1iMDQ4LWY4YjY4NmY1ZWIwYyIsCiAgICAgICAgICAgICJjb21tYW5kcyI6IFsKICAgICAgICAgICA gICAgIHsKICAgICAgICAgICAgICAgICAGICAidHlwZSI6ICJtYW51YWwiLAogICAgICAgICAGICAGICAGICAGICAJib21tYW5kIjogIlF1Z XJ51EFnYWluc3QgRENTeW5j1EFsZXJ0cyIsCiAgICAgICAgICAgICAgICAgICAgImRlc2NyaXB0aW9uIjogIiIKICAgICAgICAgICA gIH0KICAgICAgICAgICAgXQogICAgICAgIH0sCiAgICAgICAGINN0ZXAtLWRmYjVhZTE3LTlkZmMtNTkxYy1hMmVlLTJkZDdjZDM3N2Q0M CI6IHsKICAgICAgICAgICAgInR5cGUi0iAic2luZ2xlIiwKICAgICAgICAgICAgIm5hbWUi0iAiUXVlcnkgYWdhaW5zdCBvdGhlciBhbGV ydHMiLAogICAgICAgICAGICAib25fY29tcGxldGlvbiI6ICJzdGVwLS02YjhhYzVmZC02NzhkLTUwMGMtYTRkMC11ZmM2MzM5YjU4NzkiL sIiwKICAgICAgICAgICAgICAgICAgICAiY29tbWFuZCI6ICJRdWVyeSBhZ2FpbnN0IG90aGVyIGFsZXJ0cyIsCiAgICAgICAgICAgICAgICAgI ${\tt CAgICAgImR1c2NyaXB0aW9uIjogIiIKICAgICAgICAgICAgICAgIH0KICAgICAgICAgICAgXQogICAgIH0sCiAgICAgICAgICAgINN0ZXA}$ tLWUxZTZhOWQ2LTk5MTYtNTM1ZS1hNzkyLTgzOGZmZGE5ODExNSI6IHsKICAgICAgICAgICAgInR5cGUi0iAic2luZ2xlIiwKICAgICAgI CAgICAgIm5hbWUiOiAiQ29sbGVjdCAoVGltZSwgSG9zdCwgUHJvY2VzcyBJRHMpIGZyb20gYnJvd3NlciBvcGVuaW5nIG1hY3JvIGRvYyI CAgICAgICAgICJjb21tYW5kcyI6IFsKICAgICAgICAgICAgICAgIHsKICAgICAgICAgICAgICAgICAGICAIdHlwZSI6ICJtYW51YWwiLAo gICAgICAgICAgICAgICAgICAgICJjb21tYW5kIjogIkNvbGxlY3QgKFRpbWUsIEhvc3QsIFByb2Nlc3MgSURzKSBmcm9tIGJyb3dzZXIgb 3B1bmluZyBtYWNybyBkb2MiLAogICAgICAgICAgICAgICAgICJkZXNjcmlwdGlvbiI6ICIiCiAgICAgICAgICAgICAGICB9CiAgICA gICAgICAgIF0KICAgICAgICB9LAogICAgICAgICJzdGVwLS11OTE0YTE3My0wYWJmLTViNGEtYjgwNi05ODY3ZDFmMDc5MGIiOiB7CiAgI CAgICAgICAgICJ0eXBlIjogInNpbmdsZSIsCiAgICAgICAgICAgICJuYW1lIjogIlJlY29yZCBQb3RlbnRpYWwgQmVhY29uaW5nIChBZGQ gMSBwb2ludCkiLAogICAgICAgICAgICAib25fY29tcGxldGlvbiI6ICJzdGVwLS01YTk5MjMzOS0zN2RhLTVlM2UtYmI4Zi01ZTNiMDZjM zVmMTEiLAogICAgICAgICAgICAiY29tbWFuZHMiOiBbCiAgICAgICAgICAgICAgICB7CiAgICAgICAgICAgICAGICAgICAgInR5cGUiOiA ibWFudWFsIiwKICAgICAgICAgICAgICAgICAgICAiY29tbWFuZCI6ICJSZWNvcmQgUG90ZW50aWFsIEJlYWNvbmluZyAoQWRkIDEgcG9pb gICAgfSwKICAgICAgICAic3RlcC0tZWQ1NzBhMGItZjBkZC01NTQxLTk0NWMtNGU4OTc4MDIxOTRkIjogewogICAgICAgICAgICAidHlwZ SI6ICJzaW5nbGUiLAogICAgICAgICAgICAibmFtZSI6ICJRdWVyeSBBZ2FpbnN0IERDIFN5bmMgQWxlcnRzIiwKICAgICAgICAgICAgIm9 uX2NvbXBsZXRpb24i0iAic3RlcC0tNjk2NDEyNTctOTFkMS01MzE2LWFhOWUtODNmYzVjYTZhMmQ0IiwKICAgICAgICAgICAgImNvbW1hb gICAgImNvbW1hbmQiOiAiUXVlcnkgQWdhaW5zdCBEQyBTeW5jIEFsZXJ0cyIsCiAgICAgICAgICAgICAgICAgICAgIMRlc2NyaXB0aW9uI jogIiIKICAgICAgICAgICAgICAgIH0KICAgICAgICAgICAgXQogICAgIH0SCiAgICAgICAgINN0ZXAtLWVmMjM1YmNhLTZhYmEtNTE 4Ny05MmNiLTQ0MTBjNzc4NGRlMyI6IHsKICAgICAgICAgICAgInR5cGUiOiAic2luZ2xlIiwKICAgICAgICAgICAgIm5hbWUiOiAiQ29sb $\label{eq:gvjdcb0aw11lcb0b3N0lcb1c2vyIGFjY291bnQgYXNzb2NpYXRlzCB3aXRoIGV4ZmlsIiwKICAgICAgICAgICAgIm9uX2NvbXBsZXRpb24$ iOiAic3RlcC0tZjIxZTMzMDktZjk1Yi01MmVlLWE5NjMtZDZ1ZDQxZDNjY2E4IiwKICAgICAgICAgICAgImNvbW1hbmRzIjogWwogICAgI CAgICAgICAgICAgewogICAgICAgICAgICAgICAgICJ0eXBlIjogIm1hbnVhbCIsCiAgICAgICAgICAgICAgICAgICAgICAgIMNVbW1hbmQ iOiAiQ29sbGVjdCB0aW11LCBob3N0LCB1c2VyIGFjY291bnQgYXNzb2NpYXR1ZCB3aXRoIGV4ZmlsIiwKICAgICAgICAgICAgICAgICAgICAgA CAiZGVzY3JpcHRpb24i0iAiIgogICAgICAgICAgICAgICAgfQogICAgICAgICAgICBdCiAgICAgICAgFSwKICAgICAgICAGICAIc3RlcC0tZjI xZTMzMDktZjk1Yi01MmVlLWE5NjMtZDZlZDQxZDNjY2E4IjogewogICAgICAgICAgICAidHlwZSI6ICJwYXJhbGxlbCIsCiAgICAgICAgI CAgICJuZXh0X3N0ZXBzIjogWwogICAgICAgICAgICAgICAGIN0ZXAtLTU4YTM5YWE5LTUZMzQtNTRmYy04ODQyLWEzMDRkOGY5NWUwOCI sCiAgICAgICAgICAgICAgICAic3RlcC0tNzEwZTFlNjktMjQ3NS01ZDY2LWEzODUtNWU2ZmMwNmQ2NTdlIiwKICAgICAgICAgICAgICAgI





zdGVwLS1mMmI0ZTJjMC1hNDIzLTVhZDYtYjM5ZS01OTdkZGNiNmQxYTAiOiB7CiAgICAgICAgICAgICJ0eXBlIjogImVuZCIsCiAgICAgI CAgICAgICJuYW11IjogIkVuZCIKICAgICAgICB9LAogICAgICAgICJzdGVwLS1mM2ViMWYxZC11NTU3LTVjZmItYmR10C0zZTRhNTQ3YTI 1MGEiOiB7CiAgICAgICAgICAgICJ0eXBlIjogInNpbmdsZSIsCiAgICAgICAgICJuYW1lIjogIlNldCBDb3JyZWxhdGlvbiB0byBIa WdoIiwKICAgICAgICAgICAgIM9uX2NvbXBsZXRpb24iOiAic3RlcC0tNmU0YTdiYWUtYjcxZC01M2ZhLTgwY2EtZTQ1N2VlYTgwYjZkIiw KICAgICAgICAgICAgIMNvbW1hbmRzIjogWwogICAgICAgICAgICAgICAgewogICAgICAgICAgICAgICAgICAGICAGICJ0eXBlIjogIm1hbnVhb CISCIAGICAGICAGICAGICAGICAGICAGIMNvbW1hbmQi0iAiU2V0IENvcnJlbGF0aW9uIHRvIEhpZ2giLAogICAGICAGICAGICAGICAGICAGICA $\verb|giC]kZXNjcmlwdGlvbi16ICIiCiAgICAgICAgICAgICAgICB9CiAgICAgICAgICAgIF0KICAgICAgICB9LAogICAgICAgICAgICJzdGVwLS1mN| \\$ GExZmZkYy02ZjA4LTVhYjItYmEzMC1mMTMxNDM00GQ5MmUi0iB7CiAgICAgICAgICAgICJ0eXBlIjogInNpbmdsZSIsCiAgICAgICAgICA gICJuYW1lIjogIlF1ZXJ5IGFnYWluc3QgU3BlYXJwaGlzaCAyIEFsZXJ0cyIsCiAgICAgICAgICAgICJvbl9jb21wbGV0aW9uIjogInN0Z XAtLWE5MjdmOWM1LWQ5ZjctNWZ1NC04ZDQ4LTc5Zjh1MDA0ZWMzYiIsCiAgICAgICAgICAgICJjb21tYW5kcyI6IFsKICAgICAgICAgICA gICAgIHsKICAgICAgICAgICAgICAgICAgICAidHlwZSI6ICJtYW51YWwiLAogICAgICAgICAgICAgICAgICAgICJjb21tYW5kIjogIlF1Z XJ5IGFnYWluc3QgU3BlYXJwaGlzaCAyIEFsZXJ0cyIsCiAgICAgICAgICAgICAgICAgICAgImRlc2NyaXB0aW9uIjogIiIKICAgICAgICA gICAgICAgIH0KICAgICAgICAgICAgXQogICAgICAgIH0sCiAgICAgICAgInN0ZXAtLWZjNThkZDJiLWU5MzItNTcxNC04N2UxLWYwY2M00 TkzYjA0NSI6IHsKICAgICAgICAgICAgInR5cGUi0iAic2luZ2xlIiwKICAgICAgICAgICAgIm5hbWUi0iAiUmVjb3JkIFBvdGVudGlhbCB IYXNoIGNvbXByb21pc2UgKEFkZCAxIFBvaW50KSIsCiAgICAgICAgICJvb19jb21wbGV0aW9uIjogInN0ZXAtLTVhOTkyMzM5LTM3Z GEtNWUzZS1iYjhmLTVlM2IwNmMzNWYxMSIsCiAgICAgICAgICAgICJjb21tYW5kcyI6IFsKICAgICAgICAgICAgICAgIHsKICAgICAgICA gICAgICAgICAgICAidHlwZSI6ICJtYW51YWwiLAogICAgICAgICAgICAgICAgICAgICJjb21tYW5kIjogIlJlY29yZCBQb3RlbnRpYWwgS GFzaCBjb21wcm9taXNlIChBZGQgMSBQb2ludCkiLAogICAgICAgICAgICAgICAgICAgICAgICJkZXNjcmlwdGlvbiI6ICIiCiAgICAgICAgICA gICAgICB9CiAgICAgICAgICAgIF0KICAgICAgICB9LAogICAgICAgICJzdGVwLS1mZTMxNmIxNy1kODU3LTU3ZmItOTNjZS1iZTJkYzgxN DM5ZTAiOiB7CiAgICAgICAgICAGICJ0eXBlIjogInNpbmdsZSIsCiAgICAgICAgICAGICJuYW1lIjogIlJlY29yZCBEQyBTeW5jIGxlZCB 0byBMYXRlcmFsIE1vdmVtZW50IChBZGQgMSBQb2ludCkiLAogICAgICAgICAgICAgICAtb25fY29tcGxldGlvbiI6ICJzdGVwLS01YTk5MjMzO S0zN2RhLTV1M2UtYmI4Zi01ZTNiMDZjMzVmMTEiLAogICAgICAgICAGICAiY29tbWFuZHMi0iBbCiAgICAgICAgICAGICAGICB7CiAgICA gICAgICAgICAgICAgICAGINR5cGUiOiAibWFudWFsIiwKICAgICAgICAGICAGICAGICAGICAIY29tbWFuZCI6ICJSZWNvcmQgREMgU3luY yBsZWQgdG8gTGF0ZXJhbCBNb3Z1bWVudCAoQWRkIDEgUG9pbnQpIiwKICAgICAgICAgICAgICAgICAiCAiZGVzY3JpcHRpb24i0iAiIgo

},
{
 "type": "BPMN - base64 encoded .bmpn (XML) file",
 "note": "Decode base64 string and save as .bpmn file",
 "workflow":

"PD94bWwgdmVyc2lvbj0iMS4wIiBlbmNvZGluZz0iVVRGLTgiPz4KPGJwbW46ZGVmaW5pdGlvbnMgeG1sbnM6YnBtbj0iaHR0cDovL3d3d y5vbWcub3JnL3NwZWMvQlBNTi8yMDEwMDUyNC9NT0RFTCIgeG1sbnM6YnBtbmRpPSJodHRwOi8vd3d3Lm9tZy5vcmcvc3B1Yy9CUE10LzI wMTAwNTI0L0RJIiB4bWxuczpkYz0iaHR0cDovL3d3dy5vbWcub3JnL3NwZWMvREQvMjAxMDA1MjQvREMiIHhtbG5zOmRpPSJodHRwOi8vd 3d3Lm9tZy5vcmcvc3B1Yy9ERC8yMDEwMDUyNC9ESSIgeG1sbnM6YmlvYz0iaHR0cDovL2JwbW4uaW8vc2NoZW1hL2JwbW4vYmlvY29sb3I vMS4wIiB4bWxuczpjb2xvcj0iaHR0cDovL3d3dy5vbWcub3JnL3NwZWMvQlBNTi9ub24tbm9ybWF0aXZ1L2NvbG9yLzEuMCIgaWQ9IkR1Z $\verb|mluaXRpb25zXzFsbDdmbXoiIHRhcmdldE5hbWVzcGFjZT0iaHR0cDovL2JwbW4uaW8vc2NoZW1hL2JwbW4iIGV4cG9ydGVyPSJDYW11bmR|$ hIE1vZGVsZXIiIGV4cG9ydGVyVmVyc2lvbj0iNS41LjEiPgogIDxicG1uOnByb2Nlc3MgaWQ9IlByb2Nlc3NfMXFuZWd0aiIgaXNFeGVjd XRhYmxlPSJ0cnVlIj4KICAgIDxicG1uOnN0YXJ0RXZlbnQgaWQ9IlN0YXJ0RXZlbnRfMSIgbmFtZT0iT2ZmaWNlIE1hY3JvIFNwZWFycGh pc2ggMSBBbGVydCI+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMTdqcm43ejwvYnBtbjpvdXRnb2luZz4KICAgICAgPGJwbW46c2lnb mFsRXZlbnREZWZpbml0aW9uIGlkPSJTaWduYWxFdmVudERlZmluaXRpb25fMXdlYnRscCIgLz4KICAgIDwvYnBtbjpzdGFydEV2ZW50Pgo gICAgPGJwbW46c3RhcnRFdmVudCBpZD0iRXZlbnRfMTQ0cjZ6aiIgbmFtZT0iT2ZmaWNlIE1hY3JvIEV4ZWN1dGlvbiBBbGVydCI+CiAgI CAgIDxicG1uOm91dGdvaW5nPkZsb3dfMHo1MjBmaTwvYnBtbjpvdXRnb2luZz4KICAgICAgPGJwbW46c2lnbmFsRXZlbnREZWZpbml0aW9 $u \\ IG1kPSJTaWduYWxFdmVudER1Zm1uaXRpb25fMW81cm5xdiIgLz4KICAgIDwvYnBtbjpzdGFydEV2ZW50PgogICAgPGJwbW46c3RhcnRFd$ mVudCBpZD0irXZlbnRfMTMwcWx0MSIgbmFtZT0iT2ZmaWNlIE1hY3JvIFNwZWFycGhpc2ggMiBBbGVydCI+CiAgICAgIDxicG1u0m91dGd vaW5nPkZsb3dfMWs3bXRocDwvYnBtbjpvdXRnb2luZz4KICAgICAgPGJwbW46c2lnbmFsRXZlbnREZWZpbml0aW9uIGlkPSJTaWduYWxFd mVudERlZmluaXRpb25fMHV0dHQyMyIgLz4KICAgIDwvYnBtbjpzdGFydEV2ZW50PgogICAgPGJwbW46c3RhcnRFdmVudCBpZD0iRXZlbnR fMXBwOGtnciIgbmFtZT0iUmVnaXN0cnkgTW9kIEFsZXJ0Ij4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xM3dmczA4PC9icG1uOm91dAgrams and the control of the conGdvaW5nPgogICAgICA8YnBtbjpzaWduYWxFdmVudERlZmluaXRpb24gaWQ9IlNpZ25hbEV2ZW50RGVmaW5pdGlvbl8xcHl0bmptIiAvPgo gICAgPC9icG1uOnN0YXJ0RXZlbnQ+CiAgICA8YnBtbjpzdGFydEV2ZW50IGlkPSJFdmVudF8wbGF2YzkxIiBuYW11PSJEQ1N5bmMgQWxlc nQiPgogICAgICA8YnBtbjpvdXRnb21uZz5GbG93XzFsazV2MHg8L2JwbW46b3V0Z29pbmc+CiAgICAgIDxicG1uOnNpZ25hbEV2ZW50RGV maW5pdGlvbiBpZD0iU2lnbmFsRXZlbnReZWZpbml0aW9uXzBsYTNrYzQiIC8+CiAgICA8L2JwbW46c3RhcnRFdmVudD4KICAgIDxicG1u0 nN0YXJ0RXZ1bnQgaWQ9IkV2ZW50XzFyN3k4djgiIG5hbWU9IkV4ZmlsIEFsZXJ0Ij4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18wZGw 5eWJyPC9icG1uOm91dGdvaW5nPgogICAgICA8YnBtbjpzaWduYWxFdmVudERlZmluaXRpb24gaWQ9IlNpZ25hbEV2ZW50RGVmaW5pdGlvb l8wcmU5Z3FnIiAvPgogICAgPC9icG1uOnN0YXJ0RXZlbnQ+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMTdqcm43eiIgc29 1cmNlUmVmPSJTdGFydEV2ZW50XzEiIHRhcmdldFJlZj0iQWN0aXZpdHlfMHQ5cGhjbSIgLz4KICAgIDxicG1uOnRhc2sgaWQ9IkFjdGl2a XR5XzB00XBoY20iIG5hbWU9IkNvbGx1Y3QgKFRpbWUsIEhvc3QsIFByb2N1c3MgSUQpIGZvciBXZWIgQnJvd3N1ciBjYWxsZWQgZnJvbSBFbWFpbCI+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMTdqcm43ejwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+R mxvd18wYnZrdWszPC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnRhc2s+CiAgICA8YnBtbjp0YXNrIG1kPSJBY3Rpdm10eV8wcHRjOTM 3IiBuYW11PSJRdWVyeSBhZ2FpbnN0IFNwZWFycGhpc2ggMiBBbGVydHMiPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzBidmt1azM8L 2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMTA4MGx5aTwvYnBtbjpvdXRnb21uZz4KICAgIDwvYnBtbjp0YXN rPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzBidmt1azMiIHNvdXJjZVJlZj@iQWN@aXZpdHlfMHQ5cGhjbSIgdGFyZ2V@U mVmPSJBY3Rpdml0eV8wcHRjOTM3IiAvPgogICAgPGJwbW46dGFzayBpZD0iQWN0aXZpdHlfMXFkc3NidiIgbmFtZT0iQ29sbGVjdCAoVGl tZSwgSG9zdCwgUHJvY2VzcyBJRHMpIGZyb20gYnJvd3NlciBvcGVuaW5nIG1hY3JvIGRvYyI+CiAgICAgIDxicG1uOmluY29taW5nPkZsb 3dfMWs3bXRocDwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18wd29oMGp0PC9icG1uOm91dGdvaW5nPgogICA gPC9icG1uOnRhc2s+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMWs3bXRocCIgc291cmN1UmVmPSJFdmVudF8xMzBxbHQxI iB0YXJnZXRSZWY9IkFjdG12aXR5XzFxZHNzYnYiIC8+CiAgICA8YnBtbjpleGNsdXNpdmVHYXRld2F5IGlkPSJHYXRld2F5XzE3ZmZzeGU ${\tt iIG5hbWU9IklzIHRoZXJlIGFuIEVtYWlsIHRvIFdlYiBhbmQgV2ViIHRvIE9mZmljZSBhY3Rpdml0eSBvbiBob3N0IGluIHNob3J0IHRpb}$ WVmcmFtZT8iPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzEwODBseWk8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOmluY29taW5





nPkZsb3dfMGg4eDN6dDwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xdml5bzY2PC9icG1uOm91dGdvaW5nP gogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzFydTcwZGg8L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46ZXhjbHVzaXZlR2F0ZXdheT4 KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18xMDgwbHlpIiBzb3VyY2VSZWY9IkFjdGl2aXR5XzBwdGM5MzciIHRhcmdldFJlZ j0iR2F0ZXdheV8xN2Zmc3hlIiAvPgogICAgPGJwbW46ZW5kRXZlbnQgaWQ9IkV2ZW50XzBqOHhkdnIiIG5hbWU9IlN0b3AiPgogICAgICA 8YnBtbjppbmNvbWluZz5GbG93XzF2aXlvNjY8L2JwbW46aW5jb21pbmc+CiAgICA8L2JwbW46ZW5kRXZlbnQ+CiAgICA8YnBtbjpzZXF1Z W5jZUZsb3cgaWQ9IkZsb3dfMXZpeW82NiIgbmFtZT0iTk8iIHNvdXJjZVJlZj0iR2F0ZXdheV8xN2Zmc3hlIiB0YXJnZXRSZWY9IkV2ZW5 $0 \\ XzBqOHhkdnIiIC8+CiAgICA8YnBtbjpwYXJhbGxlbEdhdGV3YXkgaWQ9IkdhdGV3YXlfMWYzNGNwNCI+CiAgICAgIDxicG1uOmluY29ta$ W5nPkZsb3dfMHdvaDBqdDwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xcmNsenBoPC9icG1uOm91dGdvaW5 nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzE0ZmdxN3E8L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46cGFyYWxsZWxHYXR1d2F5P gogICAgPGJwbW46dGFzayBpZD0iQWN0aXZpdHlfMGo4NjFubSIgbmFtZT0iUXVlcnkgYWdhaW5zdCBTcGVhcnBoaXNoIDEgQWxlcnRzIj4 KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18xcmNsenBoPC9icG1u0mluY29taW5nPgogICAgICA8YnBtbjpvdXRnb21uZz5GbG93XzBoO HgzenQ8L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46dGFzaz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18xcmNsenBoIiB zb3VyY2VSZWY9IkdhdGV3YXlfMWYzNGNwNCIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8wajg2MW5tIiAvPgogICAgPGJwbW46c2VxdWVuY2VGb G93IGlkPSJGbG93XzBoOHgzenOiIHNvdXJjZVJlZj0iOWN0aXZpdHlfMGo4NjFubSIgdGFyZ2V0UmVmPSJHYXRld2F5XzE3ZmZzeGUiIC8 +CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMXJ1NzBkaCIgbmFtZT0iWUVTIiBzb3VyY2VSZWY9IkdhdGV3YXlfMTdmZnN4Z ${\tt SIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8xdHc5aGJ11iAvPgogICAgPGJwbW46dGFzayBpZD0iQWN0aXZpdHlfMXR30WhidSIgbmFtZT0iUmVagaranteed and the statement of the statement of$ jb3JkIGEgcG90ZW50aWFsIE1hY3JvIFNwZWFyUGhpc2ggZGV0ZWN0aW9uIChBZGQgMSBwb2ludD8pIj4KICAgICAgPGJwbW46aW5jb21pb +CiAgICA8L2JwbW46dGFzaz4KICAgIDxicG1uOnRhc2sgaWQ9IkFjdG12aXR5XzFmZzEwenQiIG5hbWU9IkNvbGxlY3QgVG1tZSwgUHJvY 2VzcyBOYW11LCBQcm9jZXNzIE1ELCBIb3N0Ij4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18wejUyMGZpPC9icG1uOmluY29taW5nPgo gICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzE0Y3dlMm48L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46dGFzaz4KICAgIDxicG1uOnNlc XVlbmNlRmxvdyBpZD0iRmxvd18wejUyMGZpIiBzb3VyY2VSZWY9IkV2ZW50XzE0NHI2emoiIHRhcmdldFJlZj0iQWN0aXZpdHlfMWZnMTB 6dCIgLz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18wd29oMGp0IiBzb3VyY2VSZWY9IkFjdG12aXR5XzFxZHNzYnYiIHRhc mdldFJlZj0iR2F0ZXdheV8xZjM0Y3A0IiAvPgogICAgPGJwbW46dGFzayBpZD0iQWN0aXZpdHlfMXRjY3RqcyIgbmFtZT0iUXVlcnkgYWd haW5zdCBNYWNybyBFeGVjdXRpb24gQWxlcnRzIj4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18xNGZncTdxPC9icG1uOmluY29taW5nP gogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzBzMTFxeTI8L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46dGFzaz4KICAgIDxicG1uOnN lcXVlbmNlRmxvdyBpZD0iRmxvd18xNGZncTdxIiBzb3VyY2VSZWY9IkdhdGV3YXlfMWYzNGNwNCIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8xd GNjdGpzIiAvPgogICAgPGJwbW46ZXhjbHVzaXZlR2F0ZXdheSBpZD0iR2F0ZXdheV8weThqMWJiIiBuYW11PSJJcyB0aGUgc3Bhd251ZCB wcm9jZXNzIG5hbWUgZG1mZmVyZW50IHRoYW4gdGhlIE9mZmljZSBBcHAgZm9yIENyZWF0ZWQgUHJvY2Vzcz8iPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzE0Y3dlMm48L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMXR6OWc2dzwvYnBtbjpvdXR nb2luZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18wd2dlZng5PC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOmV4Y2x1c2l2ZUdhd GV3YXk+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMTRjd2UybiIgc291cmNlUmVmPSJBY3Rpdml0eV8xZmcxMHp0IiB0YXJ nZXRSZWY9IkdhdGV3YXlfMHk4ajFiYiIgLz4KICAgIDxicG1uOmVuZEV2ZW50IGlkPSJFdmVudF8wdGxodjlmIiBuYW1lPSJTdG9wIj4KI CAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18xdHo5ZzZ3PC9icG1uOmluY29taW5nPgogICAgPC9icG1uOmVuZEV2ZW50PgogICAgPGJwbW4 6c2VxdWVuY2VGbG93IGlkPSJGbG93XzF0ejlnNnciIG5hbWU9Ik5vIiBzb3VyY2VSZWY9IkdhdGV3YXlfMHk4ajFiYiIgdGFyZ2V0UmVmP SJFdmVudF8wdGxodjlmIiAvPgogICAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzB3Z2VmeDkiIHNvdXJjZVJ1Zj0iR2F0ZXdheV8 weThqMWJiIiB0YXJnZXRSZWY9IkdhdGV3YXlfMW5paHRiOCIgLz4KICAgIDxicG1uOnBhcmFsbGVsR2F0ZXdheSBpZD0iR2F0ZXdheV8xb GbG93XzExcnh4MWU8L2JwbW46b3V0Z29pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMHJseTYwbDwvYnBtbjpvdXRnb2luZz4KI CAgIDwvYnBtbjpwYXJhbGxlbEdhdGV3YXk+CiAgICA8YnBtbjp0YXNrIGlkPSJBY3Rpdml0eV8xNWl5Y245IiBuYW1lPSJRdWVyeSBBZ2F pbnN0IFNwZWFycGhpc2ggMiBBbGVydHMiPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzExcnh4MWU8L2JwbW46aW5jb21pbmc+CiAgI CAgIDxicG1uOm91dGdvaW5nPkZsb3dfMWxlcDc10TwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjp0YXNrPgogICAgPGJwbW46c2VxdWV uY2VGbG93IGlkPSJGbG93XzExcnh4MWUiIHNvdXJjZVJlZj0iR2F0ZXdheV8xbmlodGI4IiB0YXJnZXRSZWY9IkFjdGl2aXR5XzE1aXljb jkiIC8+CiAgICA8YnBtbjpleGNsdXNpdmVHYXRld2F5IGlkPSJHYXRld2F5XzFrMzhhMnEiIG5hbWU9IkRpZCB0aGUgT2ZmaWNlIFByb2N lc3MgQ3JlYXRlIGFuIGV4ZSBvciBETEw/Ij4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18wczExcXkyPC9icG1uOmluY29taW5nPgogI CAgICA8YnBtbjppbmNvbWluZz5GbG93XzFsZXA3NTk8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMDVyYWU @cDwvYnBtbjpvdXRnb2luZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18wb3NqM29qPC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uO mV4Y2x1c2l2ZUdhdGV3YXk+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMHMxMXF5MiIgc291cmNlUmVmPSJBY3Rpdml0eV8 xdGNjdGpzIiB0YXJnZXRSZWY9IkdhdGV3YXlfMWszOGEycSIgLz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18xbGVwNzU5I iBzb3VyY2VSZWY9IkFjdGl2aXR5XzE1aXljbjkiIHRhcmdldFJlZj0iR2F0ZXdheV8xazM4YTJxIiAvPgogICAgPGJwbW46ZW5kRXZlbnQ gaWQ9IkV2ZW50XzFsZjh2OWMiIG5hbWU9IlN0b3AiPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzA1cmFlNHA8L2JwbW46aW5jb21pb mc+CiAgICA8L2JwbW46ZW5kRXZlbnQ+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMDVyYWU0cCIgbmFtZT0iTm8iIHNvdXJ jZVJlZj0iR2F0ZXdheV8xazM4YTJxIiB0YXJnZXRSZWY9IkV2ZW50XzFsZjh2OWMiIC8+CiAgICA8YnBtbjp0YXNrIGlkPSJBY3Rpdml0e V8xZHJxMGUyIiBuYW11PSJSZWNvcmQgRG93bmxvYWR1ZCBGaWx1IENyZWF0aW5nIEV4ZSAoQWRkIDEgUG9pbnQpIj4KICAgICAgPGJwbW4 6aW5jb21pbmc+Rmxvd18wb3NqM29qPC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzBzcWMzeHI8L2JwbW46b vdXJjZVJlZj0iR2F0ZXdheV8xazM4YTJxIiB0YXJnZXRSZWY9IkFjdGl2aXR5XzFkcnEwZTIiIC8+CiAgICA8YnBtbjp0YXNrIGlkPSJBY 3Rpdml0eV8xMmVrb3F1IiBuYW11PSJSZWNvcmQgT2ZmaWN1IEFwcCBjcmVhdG1uZyBFWEUgb3IgRExMwqAmIzEwOyhBZGQgMSBQb21udCk iPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzBybHk2MGw8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfM DQ0bzJyZzwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjp0YXNrPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzBybHk2MGw iIHNvdXJjZVJlZj0iR2F0ZXdheV8xbmlodGI4IiB0YXJnZXRSZWY9IkFjdGl2aXR5XzEyZWtvcXUiIC8+CiAgICA8YnBtbjp0YXNrIGlkP SJBY3Rpdml0eV8wdDlwMHUzIiBuYW11PSJRdWVyeSBhZ2FpbnN0IFJ1Z2lzdHJ5IE1vZCBBbGVydCI+CiAgICAgIDxicG1uOmluY29taW5 nPkZsb3dfMTIxOThrZTwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xOTNleWx3PC9icG1uOm91dGdvaW5nP gogICAgPC9icG1uOnRhc2s+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMDQ0bzJyZyIgc291cmNlUmVmPSJBY3Rpdml0eV8 xMmVrb3F1IiB0YXJnZXRSZWY9IkdhdGV3YXlfMGZzbmJqMSIgLz4KICAgIDxicG1uOnRhc2sgaWQ9IkFjdG12aXR5XzBvbTV1MWQiIG5hb WU9IkNvbGx1Y3QgVG1tZSwgSG9zdCwgUE1ELCB0ZXdfVmFsdWUiPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzEzd2ZzMDg8L2JwbW4 6aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMWp2eXFuYjwvYnBtbjpvdXRnb21uZz4KICAgIDwvYnBtbjp0YXNrPgogI CAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzEzd2ZzMDgiIHNvdXJjZVJ1ZjØiRXZ1bnRfMXBwOGtnciIgdGFyZ2V0UmVmPSJBY3R





pdml0eV8wb201dTFkIiAvPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzFqdnlxbmIiIHNvdXJjZVJlZj0i0WN0aXZpdHlfM G9tNXUxZCIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8xMHFmeHIzIiAvPgogICAgPGJwbW46c2VydmljZVRhc2sgaWQ9IkFjdG12aXR5XzEwcWZ zFqdnlxbmI8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMDhubGR1azwvYnBtbjpvdXRnb21uZz4KICAgIDw vYnBtbjpzZXJ2aWNlVGFzaz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18wOG5sZHVrIiBzb3VyY2VSZWY9IkFjdGl2aXR5X zEwcWZ4cjMiIHRhcmdldFJlZj0iQWN0aXZpdHlfMWI1dGV4bSIgLz4KICAgIDxicG1uOnRhc2sgaWQ9IkFjdGl2aXR5XzFiNXRleG0iIG5 hbWU9IlF1ZXJ5IEFnYWluc3QgTWFjcm8gRXhlY3V0aW9uIEFsZXJ0Ij4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18wOG5sZHVrPC9ic G1uOmluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzBhMWlvc3o8L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46dGFzaz4 KICAgIDxicG1uOmV4Y2x1c212ZUdhdGV3YXkgaWQ9IkdhdGV3YXlfMTVvMzRjOSIgbmFtZT0iRGlkIHRoYXQgRVhFIG9yIERMTCBzcGF3b iBhIHByb2Nlc3MgdGhhdCBtb2RkZWQgUmVnaXN0cnk/Ij4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18xOTNleWx3PC9icG1uOmluY29 taW5nPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzBhMWlvc3o8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb 3dfMXAOazI5MjwvYnBtbjpvdXRnb2luZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xcXdpa3ZjPC9icG1uOm91dGdvaW5nPgogICA gPC9icG1uOmV4Y2x1c2l2ZUdhdGV3YXk+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMTkzZXlsdyIgc291cmNlUmVmPSJBY 3Rpdml0eV8wdDlwMHUzIiB0YXJnZXRSZWY9IkdhdGV3YXlfMTVvMzRjOSIgLz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18 wYTFpb3N6IiBzb3VyY2VSZWY9IkFjdGl2aXR5XzFiNXRleG0iIHRhcmdldFJlZj0iR2F0ZXdheV8xNW8zNGM5IiAvPgogICAgPGJwbW46d GFzayBpZD0iQWN0aXZpdH1fMWtjOWFhaCIgbmFtZT0iUmVjb3JkIE1hY3JvIHNwYXduZWQgcHJvY2VzcyB0aGF0IG1vZGR1ZCBSZWcgKEFkZCAxIHBvaW50KSI+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMXA0azI5MjwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z 29pbmc+Rmxvd18xZjlkbDJtPC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnRhc2s+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZ sb3dfMXA0azI5MiIgbmFtZT0iWWVzIiBzb3VyY2VSZWY9IkdhdGV3YX1fMTVvMzRjOSIgdGFyZ2V0UmVmPSJBY3Rpdm10eV8xa2M5YWFoI iAvPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzEyMTk4a2UiIHNvdXJjZVJlZj0iR2F0ZXdheV8wZnNuYmoxIiB0YXJnZXR SZWY9IkFjdG12aXR5XzB00XAwdTMiIC8+CiAgICA8YnBtbjpwYXJhbGxlbEdhdGV3YXkgaWQ9IkdhdGV3YXlfMGZzbmJqMSI+CiAgICAgI DxicG1uOmluY29taW5nPkZsb3dfMDQ0bzJyZzwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xMjE5OGtlPC9 icG1uOm91dGdvaW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzFtMXJycGo8L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46cGFyY WxsZWxHYXRld2F5PgogICAgPGJwbW46ZW5kRXZlbnQgaWQ9IkV2ZW50XzFkbm1iNHUiIG5hbWU9IlN0b3AiPgogICAgICA8YnBtbjppbmN vbWluZz5GbG93XzFxd2lrdmM8L2JwbW46aW5jb21pbmc+CiAgICA8L2JwbW46ZW5kRXZlbnQ+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cga WQ9IkZsb3dfMXF3aWt2YyIgbmFtZT0iTm8iIHNvdXJjZVJlZj0iR2F0ZXdheV8xNW8zNGM5IiB0YXJnZXRSZWY9IkV2ZW50XzFkbm1iNHU iIC8+CiAgICA8YnBtbjpzdGFydEV2ZW50IGlkPSJFdmVudF8wNGVoemFvIiBuYW11PSJCZWFjb25BbGVydCI+CiAgICAgIDxicG1u0m91d GdvaW5nPkZsb3dfMW1odGlkNzwvYnBtbjpvdXRnb2luZz4KICAgICAgPGJwbW46c2lnbmFsRXZlbnREZWZpbm1@aW9uIGlkPSJTaWduYWx nRfMTl5a2QwdyIgbmFtZT0iUHJpdkVzYyBBbGVydCI+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMXAydjhzYjwvYnBtbjpvdXRnb2l uZz4KICAgICAgPGJwbW46c2lnbmFsRXZlbnREZWZpbml0aW9uIGlkPSJTaWduYWxFdmVudERlZmluaXRpb25fMW1ic21pMSIgLz4KICAgI DwvYnBtbjpzdGFydEV2ZW50PgogICAgPGJwbW46dGFzayBpZD0iQWN0aXZpdHlfMXY5bXNwZCIgbmFtZT0iQ29sbGVjdCBUaW1lLCBIb3N 0LCB0b2tlbiBpbmZvLCBhY2NvdW50IGluZm8iPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzFwMnY4c2I8L2JwbW46aW5jb21pbmc+C iAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMW00MnFuczwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjp0YXNrPgogICAgPGJwbW46c2V xdWVuY2VGbG93IG1kPSJGbG93XzFwMnY4c2IiIHNvdXJjZVJ1Zj0iRXZ1bnRfMT15a2QwdyIgdGFyZ2V0UmVmPSJBY3Rpdm10eV8xdj1tc 3BkIiAvPgogICAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzFtNDJxbnMiIHNvdXJjZVJ1Zj0iQWN0aXZpdHlfMXY5bXNwZCIgdGF yZ2V0UmVmPSJHYXRld2F5XzAxNHA0ZnEiIC8+CiAgICA8YnBtbjpwYXJhbGxlbEdhdGV3YXkgaWQ9IkdhdGV3YXlfMDE0cDRmcSI+CiAgI CAgIDxicG1uOmluY29taW5nPkZsb3dfMW00MnFuczwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xcHMxczlvPC9icG1uOm91dGdvaW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzBiandvNnY8L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46c GFyYWxsZWxHYXR1d2F5PgogICAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzFwczFzOW8iIHNvdXJjZVJ1Zj0iR2F0ZXdheV8wMTRwNGZxIiB0YXJnZXRSZWY9IkFjdG12aXR5XzBpZjMxcmMiIC8+CiAgICA8YnBtbjpzZXJ2aWNlVGFzayBpZD0iQWN0aXZpdHlfMGlmMzFyY yIgbmFtZT0iQ3JlYXRlIGNhc2Uvbm90aWZpY2F0aW9uIHRvIGludmVzdGlnYXRlIFByaXYgRXNjIj4KICAgICAgPGJwbW46aW5jb21pbmc +Rmxvd18xcHMxczlvPC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzB5bzd4MTI8L2JwbW46b3V0Z29pbmc+C iAgICA8L2JwbW46c2Vydm1jZVRhc2s+CiAgICA8YnBtbjpleGNsdXNpdmVHYXRld2F5IGlkPSJHYXRld2F5XzB00WZjN20iIG5hbWU9Ild hcyBQcml2IEVzYyBmcm9tIE5vbi10b3JtYWwgQWN0aXZpdHk/Ij4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18weW83eDEyPC9icG1u0 $\verb|mluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzF1NWRlcHM8L2JwbW46b3V0Z29pbmc+CiAgICAgIDxicG1uOm91dGdvaW5|| Construction of the contraction o$ nPkZsb3dfMHljbGp3NDwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjpleGNsdXNpdmVHYXRld2F5PgogICAgPGJwbW46c2VxdWVuY2VGb G93IGlkPSJGbG93XzB5bzd4MTIiIHNvdXJjZVJlZj0iQWN0aXZpdHlfMGlmMzFyYyIgdGFyZ2V0UmVmPSJHYXRld2F5XzB0OWZjN20iIC8 +CiAgICA8YnBtbjp@YXNrIGlkPSJBY3Rpdml@eV8wdTF2MHE2IiBuYW1lPSJSZWNvcmQgQWJub3JtYWwgUHJpdiBFc2MgKEFkZCAxIFBva W50KSI+CiAgICAgIDxicG1u0mluY29taW5nPkZsb3dfMXU1ZGVwczwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmx vd18xd3UxZW8yPC9icG1u0m91dGdvaW5nPgogICAgPC9icG1u0nRhc2s+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMXU1Z GVwcyIgbmFtZT0iWWVzIiBzb3VyY2VSZWY9IkdhdGV3YX1fMHQ5ZmM3bSIgdGFyZ2V0UmVmPSJBY3Rpdm10eV8wdTF2MHE2IiAvPgogICA gPGJwbW46ZW5kRXZlbnQgaWQ9IkV2ZW50XzAwdXAyNjMiIG5hbWU9IlN0b3AiPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzB5Y2xqd zQ8L2JwbW46aW5jb21pbmc+CiAgICA8L2JwbW46ZW5kRXZlbnQ+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMHljbGp3NCI gbmFtZT0iTm8vVW5rbm93biIgc291cmN1UmVmPSJHYXRld2F5XzB0OWZjN20iIHRhcmdldFJlZj0iRXZlbnRfMDB1cDI2MyIgLz4KICAgI DxicG1uOnRhc2sgaWQ9IkFjdG12aXR5XzB1dDA1d24iIG5hbWU9IlF1ZXJ5IEFnYWluc3QgRENTeW5jIEFsZXJ0cyI+CiAgICAgIDxicG1 uOmluY29taW5nPkZsb3dfMGJqd282djwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xZjBydTNjPC9icG1uO m91dGdvaW5nPgogICAgPC9icG1uOnRhc2s+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMGJqd282diIgc291cmNlUmVmPSJ HYXRld2F5XzAxNHA0ZnEiIHRhcmdldFJlZj0iQWN0aXZpdHlfMHV0MDV3biIgLz4KICAgIDxicG1uOnRhc2sgaWQ9IkFjdGl2aXR5XzF4N 2E4ZWUiIG5hbWU9IkNvbGxlY3QgVG1tZSwgYWNjb3VudCByZXF1ZXN0aW5nJiMxMDtIb3N0IHN1bmRpbmcsIHRyYWZmaWMgdG8gREMmIzEwOyhNdWx0aXBsZSBMb2dzKSI+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMWxrNXYweDwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwb W46b3V0Z29pbmc+Rmxvd18xeTVuaGI4PC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnRhc2s+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3c gaWQ9IkZsb3dfMWxrNXYweCIgc291cmNlUmVmPSJFdmVudF8wbGF2YzkxIiB0YXJnZXRSZWY9IkFjdGl2aXR5XzF4N2E4ZWUiIC8+CiAgI CA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMXk1bmhiOCIgc291cmNlUmVmPSJBY3Rpdml0eV8xeDdhOGVlIiB0YXJnZXRSZWY9Ikd hdGV3YX1fMhc5aXBsdiIgLz4KICAgIDxicG1u0mV4Y2x1c212ZUdhdGV3YXkgaWQ9IkdhdGV3YX1fMhc5aXBsdiIgbmFtZT0iV2FzIHJlcXVlc3QgZnJvbSBhYm5vcm1hbCB0aW11L3BsYWNlPyI+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMXk1bmhiODwvYnBtbjppbmNvbWl uZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18weDI2eGNhPC9icG1uOm91dGdvaW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93X zA5N2UzbWE8L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46ZXhjbHVzaXZlR2F0ZXdheT4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0





iRmxvd18weDI2eGNhIiBuYW11PSJZZXMiIHNvdXJjZVJ1Zj0iR2F0ZXdheV8wdzlpcGx2IiB0YXJnZXRSZWY9IkdhdGV3YXlfMXduaW14N SIgLz4KICAgIDxicG1uOnBhcmFsbGVsR2F0ZXdheSBpZD0iR2F0ZXdheV8xd25pbXg1Ij4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18 weDI2eGNhPC9icG1u0mluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzEyZ3p6bzg8L2JwbW46b3V0Z29pbmc+CiAgICAgI DxicG1uOm91dGdvaW5nPkZsb3dfMDVneG5zbDwvYnBtbjpvdXRnb2luZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xdWJidWt1PC9 icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnBhcmFsbGVsR2F0ZXdheT4KICAgIDxicG1uOmVuZEV2ZW50IG1kPSJFdmVudF8xY3J1dWpjI iBuYW11PSJTdG9wIj4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18wOTdlM21hPC9icG1uOmluY29taW5nPgogICAgPC9icG1uOmVuZEV 2ZW50PgogICAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzA5N2UzbWEiIG5hbWU9Ik5vIiBzb3VyY2VSZWY9IkdhdGV3YX1fMHc5a XBsdiIgdGFyZ2V0UmVmPSJFdmVudF8xY3JldWpjIiAvPgogICAgPGJwbW46dGFzayBpZD0iQWN0aXZpdHlfMTNvdzhhciIgbmFtZT0iUmV jb3JkIFBvdGVudG1hbCBIYXNoIGNvbXByb21pc2UgKEFkZCAxIFBvaW50KSI+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMTJnenpv0 DwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xbzV5MG91PC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnR hc2s+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMTJnenpvOCIgc291cmNlUmVmPSJHYXRld2F5XzF3bmlteDUiIHRhcmdld FJ1ZjØiQWN@aXZpdHlfMTNvdzhhciIgLz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD@iRmxvd18wNWd4bnNsIiBzb3VyY2VSZWY9Ikd hdGV3YX1fMXduaW14NSIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8xaGYzZ3djIiAvPgogICAgPGJwbW46c2VydmljZVRhc2sgaWQ9IkFjdGl2a XR5XzFoZjNnd2MiIG5hbWU9IlB1bGwgVXNlciBJRCBhbmQgSGFzaGVzIGZyb20gcmVxdWVzdCI+CiAgICAgIDxicG1u0mluY29taW5nPkZ sb3dfMDVneG5zbDwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xZ3c1eGw1PC9icG1uOm91dGdvaW5nPgogI Qcml2RXNjIEFsZXJ0cyI+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMWd3NXhsNTwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b 3V0Z29pbmc+Rmxvd18xYzJhb2JxPC9icG1u0m91dGdvaW5nPgogICAgPC9icG1u0nRhc2s+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ 9IkZsb3dfMWd3NXhsNSIgc291cmNlUmVmPSJBY3Rpdml0eV8xaGYzZ3djIiB0YXJnZXRSZWY9IkFjdGl2aXR5XzB0NWhqOWYiIC8+CiAgI CA8YnBtbjpleGNsdXNpdmVHYXRld2F5IGlkPSJHYXRld2F5XzA3YmhlcmMiIG5hbWU9IkRpZCB0aGUgaG9zdCB3aXRoIFByaXYgRXNjYWx hdGlvbiBydW4gRENzeW5jPyI+CiAgICAgIDxicG1u0mluY29taW5nPkZsb3dfMWMyYW9icTwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwb W46aW5jb21pbmc+Rmxvd18xZjBydTNjPC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjpvdXRnb21uZz5GbG93XzBva2NjNHo8L2JwbW4 6b3V0Z29pbmc+CiAgICAgIDxicG1u0m91dGdvaW5nPkZsb3dfMGlscjg1ZzwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjpleGNsdXNpd mVHYXRld2F5PgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XZFjMmFvYnEiIHNvdXJjZVJlZj0iQWN0aXZpdHlfMHQ1aGo5ZiI mVmPSJBY3Rpdml0eV8wdXQwNXduIiB0YXJnZXRSZWY9IkdhdGV3YXlfMDdiaGVyYyIgLz4KICAgIDxicG1uOnRhc2sgaWQ9IkFjdG12aXR 5XzFyd3JtOHkiIG5hbWU9I1JJY29yZCBQcml2RXNjIEFjY291bnQgYWNjZXNzaW5nIEhhc2hlcyAoYWRkIDEgcG9pbnQpIj4KICAgICAgP GJwbW46aW5jb21pbmc+Rmxvd18wb2tjYzR6PC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzF3eDIycGU8L2J XMiIHNvdXJjZVJlZj@iR2F@ZXdheV8wN2JoZXJjIiB@YXJnZXRSZWY9IkFjdGl2aXR5XzFyd3JtOHkiIC8+CiAgICA8YnBtbjp@YXNrIGl kPSJBY3Rpdml0eV8wanpnbXdqIiBuYW11PSJDb2xsZWN0IEludGVybmFsIGFuZCBFeHRlcm5hbCBIb3N0IEluZm8iPgogICAgICA8YnBtb jppbmNvbWluZz5GbG93XzFtaHRpZDc8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMGdzN3ByYjwvYnBtbjp vdXRnb2luZz4KICAgIDwvYnBtbjp0YXNrPgogICAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzFtaHRpZDciIHNvdXJjZVJ1Zj0iR XZlbnRfMDRlaHphbyIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8wanpnbXdqIiAvPgogICAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzB nczdwcmIiIHNvdXJjZVJlZj0iQWN0aXZpdHlfMGp6Z213aiIgdGFyZ2V0UmVmPSJHYXRld2F5XzFzbHoyOWMiIC8+CiAgICA8YnBtbjp0Y XNrIGlkPSJBY3Rpdml0eV8xcmp4cjRlIiBuYW11PSJSZWNvcmQgUG90ZW50aWFsIEJlYWNvbmluZyAoQWRkIDEgcG9pbnQpIj4KICAgICA gPGJwbW46aW5jb21pbmc+Rmxvd18wdHYwODRqPC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzFrbWRqaGI8L 2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46dGFzaz4KICAgIDxicG1uOnBhcmFsbGVsR2F0ZXdheSBpZD0iR2F0ZXdheV8xc2x6MjljIj4 KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18wZ3M3cHJiPC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzB0d jA4NGo8L2JwbW46b3V0Z29pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMHA3Zjd0MzwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnB tbjpwYXJhbGxlbEdhdGV3YXk+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMHR2MDg0aiIgc291cmNlUmVmPSJHYXRld2F5X zFzbHoyOWMiIHRhcmdldFJlZj0iQWN0aXZpdHlfMXJqeHI0ZSIgLz4KICAgIDxicG1uOnRhc2sgaWQ9IkFjdG12aXR5XzBqdmE0Ym8iIG5 hbWU9IlF1ZXJ5IGFnYWluc3Qgb3RoZXIgYWxlcnRzIj4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18wcDdmN3QzPC9icG1uOmluY29ta W5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzFvcW9lem48L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46dGFzaz4KICAgIDxicG1 uOnNlcXVlbmNlrmxvdyBpZD0iRmxvd18wcDdmN3QzIiBzb3VyY2VSZWY9IkdhdGV3YXlfMXNsejI5YyIgdGFyZ2V0UmVmPSJBY3Rpdml0e V8wanZhNGJvIiAvPgogICAgPGJwbW46ZXhjbHVzaXZlR2F0ZXdheSBpZD0iR2F0ZXdheV8xZ2xrZG5iIiBuYW1lPSJIYXMgSW50ZXJuYWw gaG9zdCBiZWVuIGFzc29jaWF0ZWQgd210aCBvdGhlciBhbGVydHMgcmVjZW50bHk/Ij4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18xb 3FvZXpuPC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzF2b2trNHo8L2JwbW46b3V0Z29pbmc+CiAgICAgIDx icG1uOm91dGdvaW5nPkZsb3dfMWJiYjdrZDwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjpleGNsdXNpdmVHYXRld2F5PgogICAgPGJwb W46c2VxdWVuY2VGbG93IG1kPSJGbG93XzFvcW91em4iIHNvdXJjZVJ1ZjøiQWN0aXZpdH1fMGp2YTRibyIgdGFyZ2V0UmVmPSJHYXR1d2F 5XzFnbGtkbmIiIC8+CiAgICA8YnBtbjp0YXNrIGlkPSJBY3Rpdml0eV8wbGs4NnlmIiBuYW11PSJSZWNvcmQgQmVhY29uaW5nIEFzc29ja WF0ZWQgd2l0aCBvdGhlciBiZWhhdmlvcnMgKGFkZCAxIHBvaW50KSI+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMXZva2s0ejwvYnB tbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xNDE0bDY5PC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnRhc2s+C iAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMXZva2s0eiIgbmFtZT0iWWVzIiBzb3VyY2VSZWY9IkdhdGV3YXlfMWdsa2RuYiI gdGFyZ2V0UmVmPSJBY3Rpdm10eV8wbGs4Nn1mIiAvPgogICAgPGJwbW46ZW5kRXZlbnQgaWQ9IkV2ZW50XzBwY2tqNHUiIG5hbWU9IlN0b 3AiPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzFiYmI3a2Q8L2JwbW46aW5jb21pbmc+CiAgICA8L2JwbW46ZW5kRXZlbnQ+CiAgICA 8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMWJiYjdrZCIgbmFtZT0iTm8iIHNvdXJjZVJlZj0iR2F0ZXdheV8xZ2xrZG5iIiB0YXJnZ XRSZWY9IkV2ZW50XzBwY2tqNHUiIC8+CiAgICA8YnBtbjp0YXNrIGlkPSJBY3Rpdml0eV8wM3QycTh0IiBuYW1lPSJDb2xsZWN0IHRpbWU sIGhvc3QsIHVzZXIgYWNjb3VudCBhc3NvY2lhdGVkIHdpdGggZXhmaWwiPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzBkbDl5YnI8L 2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMWNrOHBqODwvYnBtbjpvdXRnb21uZz4KICAgIDwvYnBtbjp0YXN rPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzBkbDl5YnIiIHNvdXJjZVJlZj@iRXZlbnRfMXI3eTh2OCIgdGFyZ2V@UmVmP SJBY3Rpdml0eV8wM3QycTh0IiAvPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzFjazhwajgiIHNvdXJjZVJlZj0iQWN0aXZ pdHlfMDN0MnE4dCIgdGFyZ2V0UmVmPSJHYXRld2F5XzFkZmNzYzEiIC8+CiAgICA8YnBtbjpwYXJhbGxlbEdhdGV3YXkgaWQ9IkdhdGV3Y XlfMWRmY3NjMSI+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMWNrOHBqODwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29 pbmc+Rmxvd18xdDFhYmQ1PC9icG1uOm91dGdvaW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzF4cTMzdjc8L2JwbW46b3V0Z29pb mc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMTUwYXcydzwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjpwYXJhbGxlbEdhdGV3YXk +CiAgICA8YnBtbjp@YXNrIGlkPSJBY3Rpdml@eV8xcm5wOGg4IiBuYW1lPSJSZWNvcmQgcG90ZW50aWFsIEV4ZmlsIChBZGQgMSBQb2lud CkiPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzF4cTMzdjc8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3d





fMGNlYWkxbzwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjp0YXNrPgogICAgPGJwbW46dGFzayBpZD0iOWN0aXZpdHlfMXFiaGxpdSIgb mFtZT0iUXVlcnkgQWdhaW5zdCBvdGhlciBhbGVydHMiPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzF0MWFiZDU8L2JwbW46aW5jb21 pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMGpkN2ltbDwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjp0YXNrPgogICAgPGJwb W46c2VxdWVuY2VGbG93IG1kPSJGbG93XzF0MWFiZDUiIHNvdXJjZVJlZj0iR2F0ZXdheV8xZGZjc2MxIiB0YXJnZXRSZWY9IkFjdGl2aXR 5XzFxYmhsaXUiIC8+CiAgICA8YnBtbjpleGNsdXNpdmVHYXRld2F5IGlkPSJHYXRld2F5XzB3MGowMmsiIG5hbWU9IklzIGhvc3Qgb3IgV XNlciBhY2NvdW50IGFzc29jaWF0ZWQgd2l0aCBvdGhlciBhbGVydHMgcmVjZW50bHk/Ij4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18 wamQ3aW1sPC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzBtNWgxNWM8L2JwbW46b3V0Z29pbmc+CiAgICAgI DxicG1uOm91dGdvaW5nPkZsb3dfMGh3dGdtYzwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjpleGNsdXNpdmVHYXRld2F5PgogICAgPGJ wbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzBqZDdpbWwiIHNvdXJjZVJ1Zj0iQWN0aXZpdHlfMXFiaGxpdSIgdGFyZ2V0UmVmPSJHYXRld 2F5XzB3MGowMmsiIC8+CiAgICA8YnBtbjp0YXNrIGlkPSJBY3Rpdml0eV8xZXRlbGI0IiBuYW1lPSJSZWNvcmQgRXhmaWwgYXNzb2NpYXR 1ZCB3aXRoIG90aGVyIGFjdG12aXR5IChBZGQgMSBwb2ludCkiPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzBtNWgxNWM8L2JwbW46a W5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMTMwb3Z3bTwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjp0YXNrPgogICA gPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzBtNWgxNWMiIG5hbWU9Ill1cyIgc291cmN1UmVmPSJHYXR1d2F5XzB3MGowMmsiIHRhc mdldFJlZj0iQWN0aXZpdHlfMWV0ZWxiNCIgLz4KICAgIDxicG1uOmVuZEV2ZW50IGlkPSJFdmVudF8xN2c3dmgwIiBuYW11PSJTdG9wIj4 KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18waHd0Z21jPC9icG1uOmluY29taW5nPgogICAgPC9icG1uOmVuZEV2ZW50PgogICAgPGJwb W46c2VxdWVuY2VGbG93IG1kPSJGbG93XzBod3RnbWMiIG5hbWU9Ik5vIiBzb3VyY2VSZWY9IkdhdGV3YX1fMHcwajAyayIgdGFyZ2V0UmV mPSJFdmVudF8xN2c3dmgwIiAvPgogICAgPGJwbW46dGFzayBpZD0iQWN0aXZpdHlfMWltdGhzOSIgbmFtZT0iVGFsbHkgUG9pbnRzIj4KI CAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18wdmV1MDQ2PC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzBzcWM zeHI8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMW0xcnJwajwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwb W46aW5jb21pbmc+Rmxvd18xZjlkbDJtPC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzFvNXkwb3U8L2JwbW4 6aW5jb21pbmc+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMXd4MjJwZTwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46aW5jb21pb +CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMTQxNGw2OTwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18wY 2VhaTFvPC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzEzMG92d208L2JwbW46aW5jb21pbmc+CiAgICAgIDx icG1uOmluY29taW5nPkZsb3dfMHE2aDNqOTwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18xbnluaXczPC9ic G1uOmluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzFndnE5Y3A8L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46dGFzaz4 KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18wdmVlMDQ2IiBzb3VyY2VSZWY9IkFjdGl2aXR5XzF0dzloYnUiIHRhcmdldFJlZ j0iQWN0aXZpdHlfMWltdGhzOSIgLz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18wc3FjM3hyIiBzb3VyY2VSZWY9IkFjdGl 2aXR5XzFkcnEwZTIiIHRhcmdldFJlZj0iQWN0aXZpdHlfMWltdGhzOSIgLz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18xb TFycnBqIiBzb3VyY2VSZWY9IkdhdGV3YX1fMGZzbmJqMSIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8xaW10aHM5IiAvPgogICAgPGJwbW46c2V xdWVuY2VGbG93IG1kPSJGbG93XzFmOWRsMm0iIHNvdXJjZVJ1Zj0iQWN0aXZpdHlfMWtjOWFhaCIgdGFyZ2V0UmVmPSJBY3Rpdm10eV8xa W10aHM5IiAvPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzFvNXkwb3UiIHNvdXJjZVJlZj0iQWN0aXZpdHlfMTNvdzhhciI gdGFyZ2V0UmVmPSJBY3Rpdm10eV8xaW10aHM5IiAvPgogICAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzF3eDIycGUiIHNvdXJjZ VJlZj0iQWN0aXZpdHlfMXJ3cm04eSIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8xaW10aHM5IiAvPgogICAgPGJwbW46c2VxdWVuY2VGbG93IG1 kPSJGbG93XzF3dTFlbzIiIHNvdXJjZVJlZj0iQWN0aXZpdHlfMHUxdjBxNiIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8xaW10aHM5IiAvPgogI CAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzFrbWRqaGIiIHNvdXJjZVJlZj0iQWN0aXZpdHlfMXJqeHI0ZSIgdGFyZ2V0UmVmPSJ BY3Rpdml0eV8xaW10aHM5IiAvPgogICAgPGJWbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzE0MTRsNjkiIHNvdXJjZVJlZj0iQWN0aXZpd pMW8iIHNvdXJjZVJlZj0iQWN0aXZpdHlfMXJucDhoOCIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8xaW10aHM5IiAvPgogICAgPGJwbW46c2Vxd WVuY2VGbG93IG1kPSJGbG93XzEzMG92d20iIHNvdXJjZVJ1Zj0iQWN0aXZpdH1fMWV0ZWxiNCIgdGFyZ2V0UmVmPSJBY3Rpdm10eV8xaW1@aHM5IiAvPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzFndnE5Y3AiIHNvdXJjZVJlZj@iQWN@aXZpdHlfMWltdGhzOSIgd GFyZ2V0UmVmPSJHYXRld2F5XzByOGJhMDkiIC8+CiAgICA8YnBtbjppbmNsdXNpdmVHYXRld2F5IGlkPSJHYXRld2F5XzByOGJhMDkiIG5 hbWU9I1N1dCBDb3JyZWxhdG1vbiBmb3IgQmVoYXZpb3IgU2V0IGJhc2VkIG9uIFBvaW50IFRhbGx5Ij4KICAgICAgPGJwbW46aW5jb21pb +CiAgICAgIDxicG1u0m91dGdvaW5nPkZsb3dfMGczZnl0ZDwvYnBtbjpvdXRnb2luZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18wa nBuOGoyPC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOmluY2x1c2l2ZUdhdGV3YXk+CiAgICA8YnBtbjp@YXNrIGlkPSJBY3Rpdml@eV8 xN204NDc4IiBuYW11PSJTZXQgQ29ycmVsYXRpb24gdG8gTWVkaXVtIj4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18xeTJrMHYzPC9ic G1uOmluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzE3NHU3czI8L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46dGFzaz4 KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18xeTJrMHYzIiBuYW1lPSJCZXR3ZWVuIDMgYW5kIDggcG9pbnRzIiBzb3VyY2VSZ WY9IkdhdGV3YX1fMHI4YmEwOSIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8xN204NDc4IiAvPgogICAgPGJwbW46dGFzayBpZD0iQWN0aXZpdHl fMTAwbTF1ZiIgbmFtZT0iU2V0IENvcnJlbGF0aW9uIHRvIExvdyI+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMGczZnl0ZDwvYnBtb jppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xYXppczliPC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnRhc2s+CiA gICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMGczZnl0ZCIgbmFtZT0iQmV0d2VlbiAwIGFuZCAzIHBvaW50cyIgc291cmNlUmVmP SJHYXRld2F5XzByOGJhMDkiIHRhcmdldFJlZj0iQWN0aXZpdHlfMTAwbTF1ZiIgLz4KICAgIDxicG1uOnRhc2sgaWQ9IkFjdGl2aXR5XzE @cHVqc28iIG5hbWU9IlNldCBDb3JyZWxhdGlvbiB0byBIaWdoIj4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18wanBu0GoyPC9icG1u0 gIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18wanBuOGoyIiBuYW1lPSJNb3JlIHRoYW4gOCBwb2ludHMiIHNvdXJjZVJlZj0iR2F0Z XdheV8wcjhiYTA5IiB0YXJnZXRSZWY9IkFjdGl2aXR5XzE0cHVqc28iIC8+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMTc OdTdzMiIgc291cmNlUmVmPSJBY3Rpdml0eV8xN204NDc4IiB0YXJnZXRSZWY9IkFjdGl2aXR5XzEzc3B2ZTMiIC8+CiAgICA8YnBtbjpzZ XJ2aWN1VGFzayBpZD0iQWN0aXZpdH1fMTNzcHZ1MyIgbmFtZT0iR2VuZXJhdGUgQ29ycmVsYXR1ZCBCZWhhdm1vciB0b3RpZm1jYXRpb24iPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzE3NHU3czI8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfM WF6aXM5YjwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18xZzRjeDh6PC9icG1uOmluY29taW5nPgogICAgICA 8YnBtbjpvdXRnb2luZz5GbG93XzA3OHY1NWs8L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46c2VydmljZVRhc2s+CiAgICA8YnBtbjpzZ XF1ZW5jZUZsb3cgaWQ9IkZsb3dfMWF6aXM5YiIgc291cmNlUmVmPSJBY3Rpdml0eV8xMDBtMXVmIiB0YXJnZXRSZWY9IkFjdGl2aXR5XzE zc3B2ZTMiIC8+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMWc0Y3g4eiIgc291cmNlUmVmPSJBY3Rpdml0eV8xNHB1anNvI iB0YXJnZXRSZWY9IkFjdGl2aXR5XzEzc3B2ZTMiIC8+CiAgICA8YnBtbjplbmRFdmVudCBpZD0iRXZlbnRfMGI5c25yNSIgbmFtZT0iU3R $\verb|vcCI+CiAgICAgIDxicGiuOmluY29taW5nPkZsb3dfMDc4djU1azwvYnBtbjppbmNvbWluZz4KICAgIDwvYnBtbjplbmRFdmVudD4KICAgIDwvYnBtbjplbmRfdmVudD4KICAgIDwvYnBtbjplbmRfdmVudD4KICAgIDwvYnBtbjplbmRfdmVudD4KICAgIDwvYnBtbjplbmRfdmVudD4KICAgIDwvYnBtbjplbmRfdmVudD4KICAgIDwvYnBtbjplbmRfdmVudD4KICAgIDwvYnBtbjplbmRfdmVudD4KICAgIDwvYnBtbjplbmRfdmVudD4KICAgIDwvYnBtbjplbmWAAgIDwvYnBtbjplbmWAAgIDwvYnBtbjplbmWAAgIDwvYnB$ DxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18wNzh2NTVrIiBzb3VyY2VSZWY9IkFjdG12aXR5XzEzc3B2ZTMiIHRhcmdldFJ1Zj0iRXZ





lbnRfMGI5c25yNSIgLz4KICAgIDxicG1u0nN0YXJ0RXZlbnOgaWO9IkV2ZW50XzB0d3o2MjAiIG5hbWU9IkxhdGVyYWxNb3ZlbWVudCBBb GVydCI+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMHJzYXVrdDwvYnBtbjpvdXRnb2luZz4KICAgICAgPGJwbW46c2lnbmFsRXZlbnR EZWZpbml0aW9uIGlkPSJTaWduYWxFdmVudERlZmluaXRpb25fMW8ycmNmayIgLz4KICAgIDwvYnBtbjpzdGFydEV2ZW50PgogICAgPGJwb W46dGFzayBpZD0iQWN0aXZpdHlfMXF5cXp3ZiIgbmFtZT0iQ29sbGVjdCB0aW1lLCBzb3VyY2UsIGFuZCBkZXN0aW5hdGlvbiBmb3IgbW9 2ZW11bnQiPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzByc2F1a3Q8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1u0m91dGdvaW5nP kZsb3dfMDJnczB1bzwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjp0YXNrPgogICAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzB WVuY2VGbG93IGlkPSJGbG93XzAyZ3MwdW8iIHNvdXJjZVJlZj@iQWN@aXZpdHlfMXF5cXp3ZiIgdGFyZ2V@UmVmPSJHYXRld2F5XzF@cTV vNjAiIC8+CiAgICA8YnBtbjpwYXJhbGxlbEdhdGV3YXkgaWQ9IkdhdGV3YXlfMXRxNW82MCI+CiAgICAgIDxicG1uOmluY29taW5nPkZsb 3dfMDJnczB1bzwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18wcno2b3Q5PC9icG1uOm91dGdvaW5nPgogICA gICA8YnBtbjpvdXRnb21uZz5GbG93XzEwanNwbnA8L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46cGFyYWxsZWxHYXR1d2F5PgogICAgP GJwbW46dGFzayBpZD0iQWN0aXZpdHlfMHQ2aGJ6cCIgbmFtZT0iUXVlcnkgQWdhaW5zdCBEQyBTeW5jIEFsZXJ0cyI+CiAgICAgIDxicG1 uOmluY29taW5nPkZsb3dfMHJ6Nm900TwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xZGwwdDRpPC9icG1uO m91dGdvaW5nPgogICAgPC9icG1uOnRhc2s+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMHJ6Nm90OSIgc291cmNlUmVmPSJ HYXRld2F5XzF0cTVvNjAiIHRhcmdldFJlZj0iQWN0aXZpdHlfMHQ2aGJ6cCIgLz4KICAgIDxicG1u0mV4Y2x1c2l2ZUdhdGV3YXkgaWQ9I kdhdGV3YX1fMTh1aWR5cyIgbmFtZT0iSXMgdGhlIHNvdXJjZSBvZiBMYXRlcmFsIE1vdmVtZW50IHRoZSBIb3N0IGNvbmR1Y3RpbmcgREM gU3luYz8iPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzFkbDB0NGk8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOmluY29taW5nP kZsb3dfMW01N2s2MDwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18wc2NsNmt0PC9icG1uOm91dGdvaW5nPgo gICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzB5dDRvODc8L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46ZXhjbHVzaXZlR2F0ZXdheT4KI CAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18xZGwwdDRpIiBzb3VyY2VSZWY9IkFjdGl2aXR5XzB0NmhienAiIHRhcmdldFJlZj0 iR2F0ZXdheV8xOHVpZHlzIiAvPgogICAgPGJwbW46dGFzayBpZD0iQWN0aXZpdHlfMXFxY2Q1biIgbmFtZT0iUXVlcnkgQWdhaW5zdCBFe GZpbCBBbGVydHMiPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzEwanNwbnA8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGd vaW5nPkZsb3dfMHZqaHJvaTwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjp0YXNrPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGb G93XzEwanNwbnAiIHNvdXJjZVJlZj0iR2F0ZXdheV8xdHE1bzYwIiB0YXJnZXRSZWY9IkFjdGl2aXR5XzFxcWNkNW4iIC8+CiAgICA8YnB tbjp@YXNrIGlkPSJBY3Rpdml@eV8wcnYzYW5xIiBuYW1lPSJRdWVyeSBBZ2FpbnN@IExhdGVyYWwgTW92ZW1lbnQgQWxlcnRzIj4KICAgI CAgPGJwbW46aW5jb21pbmc+Rmxvd18xdWJidWt1PC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzFtNTdrNjA 8L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46dGFzaz4KICAgIDxicG1uOnN1cXVlbmN1RmxvdyBpZD0iRmxvd18xdWJidWt1IiBzb3VyY 2VSZWY9IkdhdGV3YX1fMXduaW14NSIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8wcnYzYW5xIiAvPgogICAgPGJwbW46c2VxdWVuY2VGbG93IG1 kPSJGbG93XzFtNTdrNjAiIHNvdXJjZVJlZj0iQWN0aXZpdHlfMHJ2M2FucSIgdGFyZ2V0UmVmPSJHYXRld2F5XzE4dWlkeXMiIC8+CiAgI CA8YnBtbjp@YXNrIGlkPSJBY3Rpdml@eV8wMWFpNmtkIiBuYW11PSJSZWNvcmQgREMgU3luYyBsZWQgdG8gTGF0ZXJhbCBNb3ZlbWVudCA oQWRkIDEgUG9pbnQpIj4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18wc2NsNmt0PC9icG1u0mluY29taW5nPgogICAgICA8YnBtbjpvd XRnb2luZz5GbG93XzBxNmgzajk8L2JwbW46b3V0Z29pbmc+CiAgICA8L2JwbW46dGFzaz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0 iRmxvd18wc2NsNmt0IiBuYW11PSJZZXMiIHNvdXJjZVJ1Zj0iR2F0ZXdheV8xOHVpZHlzIiB0YXJnZXRSZWY9IkFjdG12aXR5XzAxYWk2a 2QiIC8+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMHE2aDNqOSIgc291cmNlUmVmPSJBY3Rpdml0eV8wMWFpNmtkIiB0YXJ nZXRSZWY9IkFjdGl2aXR5XzFpbXRoczkiIC8+CiAgICA8YnBtbjplbmRFdmVudCBpZD0iRXZlbnRfMTI1Z3dqYiIgbmFtZT0iU3RvcCI+C iAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMHl0NG84NzwvYnBtbjppbmNvbWluZz4KICAgIDwvYnBtbjplbmRFdmVudD4KICAgIDxicG1 uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18weXQ0bzg3IiBuYW11PSJObyIgc291cmNlUmVmPSJHYXRld2F5XzE4dWlkeXMiIHRhcmdldFJlZ j0iRXZlbnRfMTI1Z3dqYiIgLz4KICAgIDxicG1u0mV4Y2x1c2l2ZUdhdGV3YXkgaWQ9IkdhdGV3YXlfMGd5NTR0eSIgbmFtZT0iSXMgRGV zdGluYXRpb24gd2hlcmUgRXhmaWwgb2NjdXJzPyI+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMHZqaHJvaTwvYnBtbjppbmNvbWluZ z4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18wZW0xZXNsPC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzF jZngycDg8L2JwbW46b3V0Z29pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMGJrOGo5ZjwvYnBtbjpvdXRnb21uZz4KICAgIDwvY nBtbjpleGNsdXNpdmVHYXRld2F5PgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzB2amhyb2kiIHNvdXJjZVJlZj0iQWN0aXZ pdHl¹MXFxY2Q1biIgdGFyZ2V0UmVmPSJHYXR1d2F5XzBneTU0dHkiIC8+CiAgICA8YnBtbjp0YXNrIGlkPSJBY3Rpdml0eV8wY2w2NDhlI iBuYW11PSJSZWNvcmQgTGF0IE1vdmUgTGVkIHRvIEV4ZmlsIChBZGQgMSBQb2ludCkiPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzF jZngycDg8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMW55bml3MzwvYnBtbjpvdXRnb2luZz4KICAgIDwvY nBtbjp0YXNrPgogICAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzFjZngycDgiIG5hbWU9IlllcyIgc291cmNlUmVmPSJHYXRld2F 5XzBneTU0dHkiIHRhcmdldFJlZj0iQWN0aXZpdHlfMGNsNjQ4ZSIgLz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18xbnlua XczIiBzb3VyY2VSZWY9IkFjdGl2aXR5XzBjbDY00GUiIHRhcmdldFJlZj0iQWN0aXZpdHlfMWltdGhzOSIgLz4KICAgIDxicG1uOnRhc2s gaWQ9IkFjdGl2aXR5XzBlYWZrbnQiIG5hbWU9IlF1ZXJ5IEFnYWluc3QgTGF0ZXJhbCBNb3ZlbWVudCBBbGVydHMiPgogICAgICA8YnBtb jppbmNvbWluZz5GbG93XzE1MGF3Mnc8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMGVtMWVzbDwvYnBtbjp vdXRnb2luZz4KICAgIDwvYnBtbjp0YXNrPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzBlbTFlc2wiIHNvdXJjZVJlZj0iQ WNOaXZpdHlfMGVhZmtudCIgdGFyZ2V0UmVmPSJHYXRld2F5XzBneTU0dHkiIC8+CiAgICA8YnBtbjplbmRFdmVudCBpZD0iRXZlbnRfMWV sbjcyaCIgbmFtZT0iU3RvcCI+CiAgICAgIDxicG1u0mluY29taW5nPkZsb3dfMGJrOGo5ZjwvYnBtbjppbmNvbWluZz4KICAgIDwvYnBtb jplbmRFdmVudD4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18wYms4ajlmIiBuYW1lPSJObyIgc291cmNlUmVmPSJHYXRld2F 5XzBneTU0dHkiIHRhcmdldFJlZj0iRXZlbnRfMWVsbjcyaCIgLz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18xeHEzM3Y3I iBzb3VyY2VSZWY9IkdhdGV3YX1fMWRmY3NjMSIgdGFyZ2V0UmVmPSJBY3Rpdm10eV8xcm5wOGg4IiAvPgogICAgPGJwbW46c2VxdWVuY2V GbG93IGlkPSJGbG93XzE1MGF3MnciIHNvdXJjZVJlZj0iR2F0ZXdheV8xZGZjc2MxIiB0YXJnZXRSZWY9IkFjdGl2aXR5XzBlYWZrbnQiI C8+CiAgICA8YnBtbjplbmRFdmVudCBpZD0iRXZlbnRfMWZjOTlweSIgbmFtZT0iU3RvcCI+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3d fMGlscjg1ZzwvYnBtbjppbmNvbWluZz4KICAgIDwvYnBtbjplbmRFdmVudD4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18wa $\label{thm:wyodvniibu} WxyODVnIiBuYW11PSJObyIgc291cmN1UmVmPSJHYXR1d2F5XzA3YmhlcmMiIHRhcmdldFJ1Zj0iRXZlbnRfMWZj0TlweSIgLz4KICAgIDx$ icG1uOnRleHRBbm5vdGF0aW9uIGlkPSJUZXh0QW5ub3RhdGlvbl8waTQzdzM5Ij4KICAgICAgPGJwbW46dGV4dD5DaGVjayBpbnRlcm5hb CBob3N0IGFnYWluc3QgU3B1YXJwaGlzaCwgTWFjcm8sIFJlZ2lzdHJ5IE1vZCwgUHJpdkVzYywgRENTeW5jLCBhbmQgTGF0ZXJhbCBNb3Z lbWVudDwvYnBtbjp0ZXh0PgogICAgPC9icG1uOnRleHRBbm5vdGF0aW9uPgogICAgPGJwbW46YXNzb2NpYXRpb24gaWQ9IkFzc29jaWF0a W9uXzE1cnBzazAiIHNvdXJjZVJlZj0iQWN0aXZpdHlfMGp2YTRibyIgdGFyZ2V0UmVmPSJUZXh0QW5ub3RhdGlvb18waTQzdzM5IiAvPgo gIDwvYnBtbjpwcm9jZXNzPgogIDxicG1uZGk6QlBNTkRpYWdyYW0gaWQ9IkJQTU5EaWFncmFtXzEiPgogICAgPGJwbW5kaTpCUE10UGxhb mUgaWQ9IkJQTU5QbGFuZV8xIiBicG1uRWxlbWVudD0iUHJvY2Vzc18xcW5lZ3RqIj4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkV 2ZW50XzF3NWlxazZfZGkiIGJwbW5FbGVtZW50PSJTdGFydEV2ZW50XzEiIGJpb2M6c3Ryb2tlPSJyZ2IoNjcsIDE2MCwgNzEpIiBiaW9j0 mZpbGw9InJnYigyMDAsIDIzMCwgMjAxKSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSIxNzIiIHk9IjE1MiIgd2lkdGg9IjM2IiBoZWlnaHQ





9IjM2IiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgPGRjOkJvdW5kcyB4PSIxNTgiIHk9IjE5NSIgd2lkdGg9I jY1IiBoZWlnaHQ9IjQwIiAvPgogICAgICAgIDwvYnBtbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA 8YnBtbmRpOkJQTU5TaGFwZSBpZD0iRXZlbnRfMTQ0cjZ6al9kaSIgYnBtbkVsZW1lbnQ9IkV2ZW50XzE0NHI2emoiIGJpb2M6c3Ryb2tlP SJyZ2IoNjcsIDE2MCwgNzEpIiBiaW9j0mZpbGw9InJnYigyMDAsIDIzMCwgMjAxKSI+CiAgICAgICAgPGRj0kJvdW5kcyB4PSIxNzIiIHk 9IjYwOSIgd2lkdGg9IjM2IiBoZWlnaHQ9IjM2IiAvPgogICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgICAgPGRjOkJvdW5kc yB4PSIxNTQiIHk9IjY1MiIgd2lkdGg9Ijc0IiBoZWlnaHQ9IjI3IiAvPgogICAgICAgIDwvYnBtbmRpOkJQTU5MYWJlbD4KICAgICAgPC9 icG1uZGk6Q1BNT1NoYXB1PgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iRXZ1bnRfMTMwcWx0MV9kaSIgYnBtbkVsZW11bnQ9IkV2Z W50XzEzMHFsdDEiIGJpb2M6c3Ryb2tlPSJyZ2IoNjcsIDE2MCwgNzEpIiBiaW9j0mZpbGw9InJnYigyMDAsIDIzMCwgMjAxKSI+CiAgICA gICAgPGRjOkJvdW5kcyB4PSIxNzIiIHk9IjQzMiIgd2lkdGg9IjM2IiBoZWlnaHQ9IjM2IiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhY tbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iRXZlbnRfMXBwO Gtncl9kaSIgYnBtbkVsZW1lbnQ9IkV2ZW50XzFwcDhrZ3IiIGJpb2M6c3Ryb2tlPSJyZ2IoNjcsIDE2MCwgNzEpIiBiaW9jOmZpbGw9InJ nYigyMDAsIDIzMCwgMjAxKSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSIxNzIiIHk9IjgwMiIgd2lkdGg9IjM2IiBoZWlnaHQ9IjM2IiAvP gogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgPGRjOkJvdW5kcyB4PSIxNTkiIHk9Ijg0NSIgd2lkdGg9IjY1IiBoZWl naHQ9IjI3IiAvPgogICAgICAgIDwvYnBtbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRpO kJQTU5TaGFwZSBpZD0iRXZlbnRfMGxhdmM5MV9kaSIgYnBtbkVsZW1lbnQ9IkV2ZW50XzBsYXZjOTEiIGJpb2M6c3Ryb2tlPSJyZ2IoNjc sIDE2MCwgNzEpIiBiaW9jOmZpbGw9InJnYigyMDAsIDIzMCwgMjAxKSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSIxNzIiIHk9IjEyNzIiI HdpZHRoPSIzNiIgaGVpZ2h0PSIzNiIgLz4KICAgICAgICASYnBtbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3VuZHMgeD0iMTU 4IiB5PSIxMzE1IiB3aWR0aD0iNjciIGhlaWdodD0iMTQiIC8+CiAgICAgICAgPC9icG1uZGk6Q1BNTkxhYmVsPgogICAgICA8L2JwbW5ka TpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJFdmVudF8xcjd50HY4X2RpIiBicG1uRWxlbWVudD0iRXZlbnRfMXI 3eTh2OCIgYmlvYzpzdHJva2U9InJnYig2NywgMTYwLCA3MSkiIGJpb2M6ZmlsbD0icmdiKDIwMCwgMjMwLCAyMDEpIj4KICAgICAgICA8Z GM6Qm91bmRzIHg9IjE4MiIgeT0iMjA4MiIgd2lkdGg9IjM2IiBoZWlnaHQ9IjM2IiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgo gICAgICAgICAgPGRjOkJvdW5kcyB4PSIxNzkiIHk9IjIxMjUiIHdpZHRoPSI0NyIgaGVpZ2h0PSIxNCIgLz4KICAgICAgICA8L2JwbW5ka TpCUE1OTGFiZWw+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE1OU2hhcGUgaWQ9IkFjdGl2aXR5XzFmMjN oMW9fZGkiIGJwbW5FbGVtZW50PSJBY3Rpdml0eV8wdD1waGNtIj4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjI1MCIget0iMTMwIiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJBY3R pdml0eV8wcHRjOTM3X2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMHB0YzkzNyI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSI00DAiIHk9I jEzMCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRpOkJQTU5TaGF D0iMjYwIiB5PSI0MTAiIHdpZHRoPSIxMDAiIGhlaWdodD0i0DAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5 kaTpCUE10U2hhcGUgaWQ9IkdhdGV3YXlfMTdmZnN4ZV9kaSIgYnBtbkVsZW1lbnQ9IkdhdGV3YXlfMTdmZnN4ZSIgaXNNYXJrZXJWaXNpY mxlPSJ0cnV1Ij4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjYyNSIgeT0iMTQ1IiB3aWR0aD0iNTAiIGhlaWdodD0iNTAiIC8+CiAgICAgICA gPGJwbW5kaTpCUE10TGFiZWw+CiAgICAgICAgICA8ZGM6Qm91bmRzIHg9IjYwOCIgeT0iNzciIHdpZHRoPSI4MyIgaGVpZ2h0PSI2NiIgL $z 4 \texttt{KICAgICAgICAgLC3} \\ \texttt{WbW5kaTpCUE10TGFiZWw+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGU} \\ \texttt{WbW5kaTpCUE10U2hhcGU} \\$ gaWQ9IkV2ZW50XzBqOHhkdnJfZGkiIGJwbW5FbGVtZW50PSJFdmVudF8wajh4ZHZyIiBiaW9jOnN0cm9rZT0icmdiKDIyOSwgNTcsIDUzK SIgYmlvYzpmaWxsPSJyZ2IoMjU1LCAyMDUsIDIxMCkiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iNzgyIiB5PSIyMjIiIHdpZHRoPSIzNiI gaGVpZ2h0PSIzNiIgLz4KICAgICAgICA8YnBtbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3VuZHMgeD0iNzg5IiB5PSIyNjUiI HdpZHRoPSIyMyIgaGVpZ2h0PSIxNCIgLz4KICAgICAgICA8L2JwbW5kaTpCUE1OTGFiZWw+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4 KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkdhdGV3YXlfMHJiZHhwM19kaSIgYnBtbkVsZW11bnQ9IkdhdGV3YXlfMWYzNGNwNCI+C iAgICAgICAgPGRjOkJvdW5kcyB4PSI2MDUiIHk9IjQyNSIgd2lkdGg9IjUwIiBoZWlnaHQ9IjUwIiAvPgogICAgICA8L2JwbW5kaTpCUE1 OU2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJBY3Rpdml@eV8wajg2MW5tX2RpIiBicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWVudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWvudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWvudD@iQWN@aXZpdHlfMagAgIDxicG1uRWxlbWxldAgIDxicG1uRWxlbWxldAgIDxicG1uRWxlbWxldAgIDxicG1uRWxlbWxldAgIDxicG1uRWxlbWxldAgIDxicG1uRWxlbWxldAgIDxicG1uRWxlbWxldAgIDxicG1uRWxlbWxldAgIDxicG1uRWxlbWxldAgIDxicG1uRWxlbWxldAgIDxicG1uRWxlbWxldAgIDxicG1uRWxlbWxldAgIDxicG1uRWxldAgIDxicG1uRWxlbWxldAgIDxicG1uRWxlbWxldAgIDxicG1uRXxldAgIDxicG1uRWxldAgIDxiGo4NjFubSI+CiAgICAgICAgPGRj0kJvdW5kcyB4PSI10DAiIHk9IjMxMCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLZ4KICAgICAgPC9 icG1uZGk6Q1BNT1NoYXB1PgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iQWN0aXZpdH1fMXR3OWhidV9kaSIgYnBtbkVsZW11bnQ9I kFjdGl2aXR5XzF0dzloYnUiIGJpb2M6c3Ryb2tlPSJyZ2IoMzAsIDEzNiwgMjI5KSIgYmlvYzpmaWxsPSJyZ2IoMTg3LCAyMjIsIDI1MSk iPgogICAgICAgIDxkYzpCb3VuZHMgeD@iNzUwIiB5PSIxMzAiIHdpZHRoPSIxMDAiIGhlaWdodD@iODAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE1OU2hhcGUgaWQ9IkFjdGl2aXR5XzFmZzEwenRfZGkiIGJwbW5FbGVtZW50PSJBY3Rpdml 0eV8xZmcxMHp0Ij4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjI2MCIgeT0iNTg3IiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgI CA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJBY3Rpdml0eV8xdGNjdGpzX2RpIiBicG1uRWxlbWV udD0iQWN0aXZpdHlfMXRjY3RqcyI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSI3NDAiIHk9IjQxMCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4M CIgLz4KICAgICAgPC9icG1uZGk6QlBNT1NoYXB1PgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iR2F0ZXdheV8weThqMWJiX2RpIiB icG1uRWxlbWVudD0iR2F0ZXdheV8weThqMWJiIiBpc01hcmtlclZpc2libGU9InRydWUiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iNDE1I iB5PSI2MDIiIHdpZHRoPSI1MCIgaGVpZ2h0PSI1MCIgLz4KICAgICAgICA8YnBtbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3V uZHMgeD0iMzk1IiB5PSI1MjciIHdpZHRoPSI4OSIgaGVpZ2h0PSI2NiIgLz4KICAgICAgICA8L2JwbW5kaTpCUE1OTGFiZWw+CiAgICAgI FdmVudF8wdGxodjlmIiBiaW9jOnN0cm9rZT0icmdiKDIyOSwgNTcsIDUzKSIgYmlvYzpmaWxsPSJyZ2IoMjU1LCAyMDUsIDIxMCkiPgogI CAgICAgIDxkYzpCb3VuZHMgeD0iNTIyIiB5PSI2OTIiIHdpZHRoPSIzNiIgaGVpZ2h0PSIzNiIgLz4KICAgICAgICA8YnBtbmRpOkJQTU5 2JwbW5kaTpCUE1OTGFiZWw+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE1OU2hhcGUgaWQ9IkdhdGV3YXl fMGJicnk4aF9kaSIgYnBtbkVsZW1lbnQ9IkdhdGV3YXlfMW5paHRiOCI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSI2MDUiIHk9IjYwMiIgd 2lkdGg9IjUwIiBoZWlnaHQ9IjUwIiAvPgogICAgICA8L2JwbW5kaTpCUE1OU2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJ BY3Rpdml0eV8xNWl5Y245X2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMTVpeWNuOSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSI3NDAiI Hk9IjU4NyIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRp0kJQTU5 TaGFwZSBpZD0iR2F0ZXdheV8xazM4YTJxX2RpIiBicG1uRWxlbWVudD0iR2F0ZXdheV8xazM4YTJxIiBpc01hcmtlclZpc2libGU9InRyd WUiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iOTI11iB5PSI0MjUiIHdpZHRoPSI1MCIgaGVpZ2h0PSI1MCIgLz4KICAgICAgICA8YnBtbmR pOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3VuZHMgeD0iOTEyIiB5PSIzODAiIHdpZHRoPSI3NiIgaGVpZ2h0PSI0MCIgLz4KICAgI CAgICA8L2JwbW5kaTpCUE10TGFiZWw+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkV 2ZW50XzFsZjh2OWNfZGkiIGJwbW5FbGVtZW50PSJFdmVudF8xbGY4djljIiBiaW9jOnN0cm9rZT0icmdiKDIyOSwgNTcsIDUzKSIgYmlvY zpmaWxsPSJyZ2IoMjU1LCAyMDUsIDIxMCkiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iMTAxMiIgeT0iNDkyIiB3aWR0aD0iMzYiIGhlaWd





odD0iMzYiIC8+CiAgICAgICAgPGJwbW5kaTpCUE1OTGFiZWw+CiAgICAgICAgICA8ZGM6Om91bmRzIHg9IjEwMTkiIHk9IjUzNSIgd2lkd Gg9IjIzIiBoZWlnaHQ9IjE0IiAvPgogICAgICAgIDwvYnBtbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICA gICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iQWN0aXZpdHlfMWRycTBlMl9kaSIgYnBtbkVsZW1lbnQ9IkFjdGl2aXR5XzFkcnEwZTIiIGJpb 2M6c3Ryb2t1PSJyZ2IoMzAsIDEzNiwgMjI5KSIgYmlvYzpmaWxsPSJyZ2IoMTg3LCAyMjIsIDI1MSkiPgogICAgICAgIDxkYzpCb3VuZHM geD0iMTE1MCIgeT0iNDEwIiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE1OU2hhcGU+CiAgICAgIDxic G1uZGk6QlBNTlNoYXBlIGlkPSJBY3Rpdml0eV8xMmVrb3F1X2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMTJla29xdSIgYmlvYzpzdHJ va2U9InJnYigzMCwgMTM2LCAyMjkpIiBiaW9jOmZpbGw9InJnYigxODcsIDIyMiwgMjUxKSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSI5N TAiIHk9IjU4NyIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRpOkJ QTU5TaGFwZSBpZD0iQWN0aXZpdHlfMHQ5cDB1M19kaSIgYnBtbkVsZW1lbnQ9IkFjdGl2aXR5XzB00XAwdTMiPgogICAgICAgIDxkYzpCb 3VuZHMgeD0iMTE1MCIgeT0iNTg3IiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICA gIDxicG1uZGk6Q1BNT1NoYXB1IG1kPSJBY3Rpdml0eV8wb201dTFkX2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMG9tNXUxZCI+CiAgI CAgICAgPGRjOkJvdW5kcyB4PSIyNjAiIHk9Ijc4MCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTlN oYXBlPgogICAgICA8YnBtbmRp0kJQTU5TaGFwZSBpZD0iQWN0aXZpdHlfMDFpeWRzb19kaSIgYnBtbkVsZW1lbnQ9IkFjdGl2aXR5XzEwc WZ4cjMiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iNDIwIiB5PSI3ODAiIHdpZHRoPSIxMDAiIGhlaWdodD0i0DAiIC8+CiAgICAgIDwvYnB tbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkFjdGl2aXR5XzFiNXRleG1fZGkiIGJwbW5FbGVtZW50PSJBY 3Rpdml0eV8xYjV0ZXhtIj4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjcwMCIgeT0iNzgwIiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjgwIiAvPgo gICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJHYXRld2F5XzE1bzM0YzlfZGkiIGJwbW5Fb GVtZW50PSJHYXRld2F5XzE1bzM0YzkiIGlzTWFya2VyVmlzaWJsZT0idHJ1ZSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSIxMzA1IiB5PSI 2MDIiIHdpZHRoPSI1MCIgaGVpZ2h0PSI1MCIgLz4KICAgICAgICA8YnBtbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3VuZHMge D0iMTI4NSIgeT0iNTQzIiB3aWR0aD0iOTAiIGhlaWdodD0iNTMiIC8+CiAgICAgICAgPC9icG1uZGk6QlBNTkxhYmVsPgogICAgICA8L2J wbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6Q1BNTlNoYXBlIG1kPSJBY3Rpdml0eV8xa2M5YWFoX2RpIiBicG1uRWxlbWVudD0iO WN0aXZpdHlfMWtjOWFhaCIgYmlvYzpzdHJva2U9InJnYigzMCwgMTM2LCAyMjkpIiBiaW9jOmZpbGw9InJnYigxODcsIDIyMiwgMjUxKSI +CiAgICAgICAgPGRjOkJvdW5kcyB4PSIxNDEwIiB5PSI1ODciIHdpZHRoPSIxMDAiIGhlaWdodD@iODAiIC8+CiAgICAgIDwvYnBtbmRpO kJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkdhdGV3YXlfMW84NXpt0F9kaSIgYnBtbkVsZW1lbnQ9IkdhdGV3YXl fMGZzbmJqMSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSIxMDc1IiB5PSI2MDIiIHdpZHRoPSI1MCIgaGVpZ2h0PSI1MCIgLz4KICAgICAgP C9icG1uZGk6Q1BNT1NoYXB1PgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iRXZ1bnRfMWRubWI0dV9kaSIgYnBtbkVsZW11bnQ91kV 2ZW50XzFkbm1iNHUiIGJpb2M6c3Ryb2tlPSJyZ2IoMjI5LCA1NywgNTMpIiBiaW9jOmZpbGw9InJnYigyNTUsIDIwNSwgMjEwKSI+CiAgI CAgICAgPGRjOkJvdW5kcyB4PSIxNDQyIiB5PSI2ODIiIHdpZHRoPSIzNiIgaGVpZ2h0PSIzNiIgLz4KICAgICAgICA8YnBtbmRpOkJQTU5 MYWJlbD4KICAgICAgICAgIDxkYzpCb3VuZHMgeD0iMTQ00SIgeT0iNzI1IiB3aWR0aD0iMjMiIGhlaWdodD0iMTQiIC8+CiAgICAgICAgP C9icG1uZGk6Q1BNTkxhYmVsPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6Q1BNT1NoYXB1IG1kPSJFdmVudF8 wNGVoemFvX2RpIiBicG1uRWxlbWVudD0iRXZlbnRfMDRlaHphbyIgYmlvYzpzdHJva2U9InJnYig2NywgMTYwLCA3MSkiIGJpb2M6Zmlsb D0icmdiKDIwMCwgMjMwLCAyMDEpIj4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjE4MiIgeT0iMjQwMiIgd2lkdGg9IjM2IiBoZWlnaHQ9IjM 2IiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgPGRj0kJvdW5kcyB4PSIxNzIiIHk9IjI0NDUiIHdpZHRoPSI2M CIgaGVpZ2h0PSIxNCIgLz4KICAgICAgICA8L2JwbW5kaTpCUE10TGFiZWw+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJ wbW5kaTpCUE10U2hhcGUgaWQ9IkV2ZW50XzE5eWtkMHdfZGkiIGJwbW5FbGVtZW50PSJFdmVudF8x0XlrZDB3IiBiaW9jOnN0cm9rZT0ic mdiKDY3LCAxNjAsIDcxKSIgYmlvYzpmaWxsPSJyZ2IoMjAwLCAyMzAsIDIwMSkiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iMTcyIiB5PSI 5NjIiIHdpZHRoPSIzNiIgaGVpZ2h0PSIzNiIgLz4KICAgICAgICA8YnBtbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3VuZHMge D0iMTYwIiB5PSIxMDA1IiB3aWR0aD0iNjMiIGhlaWdodD0iMTQiIC8+CiAgICAgICAgPC9icG1uZGk6QlBNTkxhYmVsPgogICAgICA8L2J wbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6Q1BNTlNoYXBlIG1kPSJBY3Rpdml0eV8xdjltc3BkX2RpIiBicG1uRWxlbWVudD0iQ WN0aXZpdHlfMXY5bXNwZCI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSIyNjAiIHk9Ijk0MCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLz4 KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iR2F0ZXdheV8xbmtmaTRlX2RpIiBicG1uR WxlbWVudD0iR2F0ZXdheV8wMTRwNGZxIj4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjQ0NSIgeT0iOTU1IiB3aWR0aD0iNTAiIGhlaWdodD0 iNTAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkFjdG12aXR5XzEydmxobzhfZ GkiIGJwbW5FbGVtZW50PSJBY3Rpdml0eV8waWYzMXJjIj4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjU2MCIgeT0i0TQwIiB3aWR0aD0iMTA wIiBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJHYXRld2F5X zB0OWZjN21fZGkiIGJwbW5FbGVtZW50PSJHYXRld2F5XzB0OWZjN20iIGlzTWFya2VyVmlzaWJsZT0idHJ1ZSI+CiAgICAgICAgPGRjOkJ vdW5kcyB4PSI3NDUiIHk9Ijk1NSIgd2lkdGg9IjUwIiBoZWlnaHQ9IjUwIiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgI CAgICAgPGRjOkJvdW5kcyB4PSI3MjcuNSIgeT0iOTA1IiB3aWR0aD0iODUiIGhlaWdodD0iNDAiIC8+CiAgICAgICAgPC9icG1uZGk6QlB NTkxhYmVsPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJBY3Rpdml0eV8wdTF2MHE2X 2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMHUxdjBxNiIgYmlvYzpzdHJva2U9InJnYigzMCwgMTM2LCAyMjkpIiBiaW9jOmZpbGw9InJ nYigxODcsIDIyMiwgMjUxKSI+CiAgICAgPGRjOkJvdW5kcyB4PSI5MzAiIHk9Ijk0MCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgL z4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iRXZlbnRfMDB1cDI2M19kaSIgYnBtbkV sZW1lbnQ9IkV2ZW50XzAwdXAyNjMiIGJpb2M6c3Ryb2tlPSJyZ2IoMjI5LCA1NywgNTMpIiBiaW9jOmZpbGw9InJnYigyNTUsIDIwNSwgM jEwKSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSI4OTIiIHk9IjEwNTIiIHdpZHRoPSIzNiIgaGVpZ2h0PSIzNiIgLz4KICAgICAgICA8YnB tbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3VuZHMgeD0iODk5IiB5PSIxMDk1IiB3aWR0aD0iMjMiIGhlaWdodD0iMTQiIC8+C iAgICAgICAgPC9icG1uZGk6Q1BNTkxhYmVsPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6Q1BNT1NoYXBlIG1 kPSJBY3Rpdml0eV8wdXQwNXduX2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMHV0MDV3biI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSIxM TMwIiB5PSIxMTAwIiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk 6Q1BNTlNoYXBlIG1kPSJBY3Rpdml0eV8xeDdhOGVlX2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMXg3YThlZSI+CiAgICAgICAgPGRjO kJvdW5kcyB4PSIyNjAiIHk9IjEyNTAiIHdpZHRoPSIxMDAiIGhlaWdodD0iODAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICA gICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkdhdGV3YXlfMHc5aXBsdl9kaSIgYnBtbkVsZW1lbnQ9IkdhdGV3YXlfMHc5aXBsdiIgaXNNY XJrZXJWaXNpYmxlPSJ0cnVlIj4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjQyNSIgeT0iMTI2NSIgd2lkdGg9IjUwIiBoZWlnaHQ9IjUwIiA vPgogICAgICAgIDxicG1uZGk6Q1BNTkxhYmVsPgogICAgICAgICAgPGRjOkJvdW5kcyB4PSI0MDYiIHk9IjEyMjAiIHdpZHRoPSI4NyIga GVpZ2h0PSI0MCIgLz4KICAgICAgICABL2JwbW5kaTpCUE10TGFiZWw+CiAgICAgIDwvYnBtbmRp0kJQTU5TaGFwZT4KICAgICAgPGJwbW5 kaTpCUE10U2hhcGUgaWQ9IkdhdGV3YXlfMHI1bnRxbl9kaSIgYnBtbkVsZW1lbnQ9IkdhdGV3YXlfMXduaW14NSI+CiAgICAgICAgPGRjO kJvdW5kcyB4PSI10DUiIHk9IjEyNjUiIHdpZHRoPSI1MCIgaGVpZ2h0PSI1MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICA gICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iRXZlbnRfMWNyZXVqY19kaSIgYnBtbkVsZW1lbnQ9IkV2ZW50XzFjcmV1amMiIGJpb2M6c3Ryb 2tlPSJyZ2IoMjI5LCA1NywgNTMpIiBiaW9jOmZpbGw9InJnYigyNTUsIDIwNSwgMjEwKSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSI1MTI





iIHk9IjEzODIiIHdpZHRoPSIzNiIgaGVpZ2h0PSIzNiIgLz4KICAgICAgICA8YnBtbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb 3VuZHMgeD0iNTE5IiB5PSIxNDI1IiB3aWR0aD0iMjMiIGhlaWdodD0iMTQiIC8+CiAgICAgICAgPC9icG1uZGk6QlBNTkxhYmVsPgogICA gICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJBY3Rpdml0eV8xM293OGFyX2RpIiBicG1uRWxlb WVudD0iQWN0aXZpdHlfMTNvdzhhciIgYmlvYzpzdHJva2U9InJnYigzMCwgMTM2LCAyMjkpIiBiaW9jOmZpbGw9InJnYigxODcsIDIyMiw gMjUxKSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSI3NTAiIHk9IjEzOTAiIHdpZHRoPSIxMDAiIGhlaWdodD0iODAiIC8+CiAgICAgIDwvY nBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkFjdGl2aXR5XzAzZHR3azFfZGkiIGJwbW5FbGVtZW50PSJ BY3Rpdml0eV8xaGYzZ3djIj4KICAgICAgICA8ZGM6Qm91bmRzIHg9Ijc1MCIgeT0iMTI1MCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgL $z 4 \texttt{KICAgICAgPC9} \\ i c 6 1 u Z G k 6 Q 1 B N T 1 N o YX B 1 P g o g I C A g I C A S Y n B t b m R p O k J Q T U S T A G F w Z S B p Z D 0 i Q W N 0 a X Z p d H 1 f M H Q 1 a G O S Z 1 9 k a S I g Y n B t b m R p O k J Q T U S T A G F w Z S B p Z D 0 i Q W N 0 a X Z p d H 1 f M H Q 1 a G O S Z 1 9 k a S I g Y n B t b m R p O k J Q T U S T A G F W Z S B P Z D 0 i Q W N 0 a X Z p d H 1 f M H Q 1 a G O S Z 1 9 k a S I g Y n B T D 0 i Q W N 0 a X Z p d H 1 f M H Q 1 a G O S Z 1 9 k a S I g Y n B T D 0 i Q W N 0 a X Z p d H 1 f M H Q 1 a G O S Z 1 9 k a S I g Y n B T D 0 i Q W N 0 a X Z p d H 1 f M H Q 1 a G O S Z 1 9 k a S I g Y n B T D 0 i Q W N 0 a X Z p d H 1 f M H Q 1 a G O S Z 1 9 k a S I g Y n B T D 0 i Q W N 0 a X Z p d H 1 f M H Q 1 a G O S Z 1 9 k a S I g Y n B T D 0 i Q W N 0 a X Z p d H 1 f M H Q 1 a G O S Z 1 9 k a S I g Y n B T D 0 i Q W N 0 a X Z p d H 1 f M H Q 1 a G O S Z 1 9 k a S I g Y n B T D 0 i Q W N 0 a X Z p d H 1 f M H Q 1 a G O S Z 1 9 k a S I g Y n B T D 0 i Q W N 0 a X Z p d H 1 f M H Q 1 a G O S Z 1 9 k a S I g Y n B T D 0 i Q W N 0 a X Z p d H 1 f M H Q 1 a G O S Z 1 9 k a S I g Y n B T D 0 i Q W N 0 a X Z p d H 1 f M H Q 1 a G O S Z P D 0 i Q W N 0 a X Z p d H 1 f M D 0 i Q W N 0 a X P D 0 i Q W N$ tbkVsZW1lbnQ9IkFjdGl2aXR5XzB0NWhqOWYiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iOTUwIiB5PSIxMjUwIiB3aWR0aD0iMTAwIiBoZ WlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJHYXRld2F5XzA3Ymh lcmNfZGkiIGJwbW5FbGVtZW50PSJHYXRld2F5XzA3YmhlcmMiIGlzTWFya2VyVmlzaWJsZT0idHJ1ZSI+CiAgICAgICAgPGRj0kJvdW5kc yB4PSIxMTU1IiB5PSIxMjY1IiB3aWR0aD0iNTAiIGhlaWdodD0iNTAiIC8+CiAgICAgPGJwbW5kaTpCUE1OTGFiZWw+CiAgICAgICA gICA8ZGM6Qm91bmRzIHg9IjExMzkiIHk9IjEzMzAiIHdpZHRoPSI4MiIgaGVpZ2h0PSI0MCIgLz4KICAgICAgICA8L2JwbW5kaTpCUE1OT GFiZWw+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkFjdGl2aXR5XzFyd3Jt0HlfZGk iIGJwbW5FbGVtZW50PSJBY3Rpdml0eV8xcndybTh5IiBiaW9jOnN0cm9rZT0icmdiKDMwLCAxMzYsIDIyOSkiIGJpb2M6ZmlsbD0icmdiK ${\tt DE4NywgMjIyLCAyNTEpIj4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjE0MDAiIHk9IjEyNTAiIHdpZHRoPSIxMDAiIGhlaWdodD@iODAiIC8}$ +CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE1OU2hhcGUgaWQ9IkFjdGl2aXR5XzBqemdtd2pfZGkiIGJwb W5FbGVtZW50PSJBY3Rpdml0eV8wanpnbXdqIj4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjMwMCIgeT0iMjM4MCIgd2lkdGg9IjEwMCIgaGV pZ2h0PSI4MCIgLz4KICAgICAgPC9icG1uZGk6Q1BNT1NoYXB1PgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iQWN0aXZpdHlfMXJqe HI0ZV9kaSIgYnBtbkVsZW1lbnQ9IkFjdGl2aXR5XzFyanhyNGUiIGJpb2M6c3Ryb2tlPSJyZ2IoMzAsIDEzNiwgMjI5KSIgYmlvYzpmaWx sPSJyZ2IoMTg3LCAyMjIsIDI1MSkiPgogICAgICAgIDxkYzpCb3VuZHMgeD0i0TkwIiB5PSIyMzgwIiB3aWR0aD0iMTAwIiBoZWlnaHQ9I jgwIiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIG1kPSJHYXRld2F5XzBzZmZmajRfZGk iIGJwbW5FbGVtZW50PSJHYXRld2F5XzFzbHoyOWMiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iNTA1IiB5PSIyMzk1IiB3aWR0aD0iNTAiI GhlaWdodD0iNTAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkFjdGl2aXR5XzB qdmE0Ym9fZGkiIGJwbW5FbGVtZW50PSJBY3Rpdml0eV8wanZhNGJvIj4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjYwMCIgeT0iMjQ5MCIgd 2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0 iR2F0ZXdheV8xZ2xrZG5iX2RpIiBicG1uRWxlbWVudD0iR2F0ZXdheV8xZ2xrZG5iIiBpc01hcmtlclZpc2libGU9InRydWUiPgogICAgI CAgIDxkYzpCb3VuZHMgeD0iMTE5NSIgeT0iMjUwNSIgd2lkdGg9IjUwIiBoZWlnaHQ9IjUwIiAvPgogICAgICAgIDxicG1uZGk6QlBNTkx hYmVsPgogICAgICAgICAgPGRjOkJvdW5kcyB4PSIxMTc4IiB5PSIyNDUzIiB3aWR0aD0i0DQiIGhlaWdodD0iNTMiIC8+CiAgICAgICAgP C9icG1uZGk6Q1BNTkxhYmVsPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6Q1BNT1NoYXB1IG1kPSJBY3Rpdml 0eV8wbGs4NnlmX2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMGxrODZ5ZiIgYmlvYzpzdHJva2U9InJnYigzMCwgMTM2LCAyMjkpIiBia W9jOmZpbGw9InJnYigxODcsIDIyMiwgMjUxKSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSIxMzQwIiB5PSIyNDkwIiB3aWR0aD0iMTAwIiB oZWlnaHQ9IjgwIiAvPgogICAgICAgL2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6Q1BNT1NoYXB1IG1kPSJFdmVudF8wcGNraunderf8wcGNraujR1X2RpIiBicG1uRWxlbWVudD0iRXZlbnRfMHBja2o0dSIgYmlvYzpzdHJva2U9InJnYigyMjksIDU3LCA1MykiIGJpb2M6ZmlsbD0icmd iKDI1NSwgMjA1LCAyMTApIj4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjEyODIiIHk9IjI1OTIiIHdpZHRoPSIzNiIgaGVpZ2h0PSIzNiIgL z4KICAgICAgICA8YnBtbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3VuZHMgeD0iMTI4OSIgeT0iMjYzNSIgd2lkdGg9IjIzIiB oZWlnaHQ9IjE0IiAvPgogICAgICAgIDwvYnBtbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtb mRpOkJQTU5TaGFwZSBpZD0iQWN0aXZpdHlfMDN0MnE4dF9kaSIgYnBtbkVsZW1lbnQ9IkFjdGl2aXR5XzAzdDJxOHQiPgogICAgICAgIDx kYzpCb3VuZHMgeD0iMjkwIiB5PSIyMDYwIiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE1OU2hhcGU+C iAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJHYXRld2F5XzAweTN4c2VfZGkiIGJwbW5FbGVtZW50PSJHYXRld2F5XzFkZmNzYzEiPgo gICAgICAgIDxkYzpCb3VuZHMgeD0iNTI1IiB5PSIyMDc1IiB3aWR0aD0iNTAiIGhlaWdodD0iNTAiIC8+CiAgICAgIDwvYnBtbmRpOkJQT U5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkFjdGl2aXR5XzFybnA4aDhfZGkiIGJwbW5FbGVtZW50PSJBY3Rpdml0eV8 xcm5w0Gg4IiBiaW9j0nN0cm9rZT0icmdiKDMwLCAxMzYsIDIyOSkiIGJpb2M6ZmlsbD0icmdiKDE4NywgMjIyLCAyNTEpIj4KICAgICAgI CA8ZGM6Qm91bmRzIHg9Ijc5MCIgeT0iMjA2MCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLz4KICAgICAgPC9icG1uZGk6QlBNT1NoYXB lPgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iQWN0aXZpdHlfMXFiaGxpdV9kaSIgYnBtbkVsZW1lbnQ9IkFjdGl2aXR5XzFxYmhsa XUiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iNjMwIiB5PSIyMTcwIiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5 kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJHYXRld2F5XzB3MGowMmtfZGkiIGJwbW5FbGVtZW50PSJHYXRld 2F5XzB3MGowMmsiIG1zTWFya2VyVmlzaWJsZT0idHJ1ZSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSIxMTY1IiB5PSIyMTg1IiB3aWR0aD0 iNTAiIGhlaWdodD0iNTAiIC8+CiAgICAgICAgPGJwbW5kaTpCUE1OTGFiZWw+CiAgICAgICAgICA8ZGM6Qm91bmRzIHg9IjExNTIiIHk9I jIxMDciIHdpZHRoPSI3NiIgaGVpZ2h0PSI2NiIgLz4KICAgICAgICA8L2JwbW5kaTpCUE1OTGFiZWw+CiAgICAgIDwvYnBtbmRpOkJQTU5 TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkFjdGl2aXR5XzFldGVsYjRfZGkiIGJwbW5FbGVtZW50PSJBY3Rpdml0eV8xZ XRlbGI0IiBiaW9jOnN0cm9rZT0icmdiKDMwLCAxMzYsIDIyOSkiIGJpb2M6ZmlsbD0icmdiKDE4NywgMjIyLCAyNTEpIj4KICAgICAgICA 8ZGM6Qm91bmRzIHg9IjEzNjAiIHk9IjIxNzAiIHdpZHRoPSIxMDAiIGhlaWdodD0iODAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZ T4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkV2ZW50XzE3Zzd2aDBfZGkiIGJwbW5FbGVtZW50PSJFdmVudF8xN2c3dmgwIiBiaW9 jOnN0cm9rZT0icmdiKDIyOSwgNTcsIDUzKSIgYmlvYzpmaWxsPSJyZ2IoMjU1LCAyMDUsIDIxMCkiPgogICAgICAgIDxkYzpCb3VuZHMge D0iMTI3MiIgeT0iMjMwMiIgd2lkdGg9IjM2IiBoZWlnaHQ9IjM2IiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICA gPGRjOkJvdW5kcyB4PSIxMjc5IiB5PSIyMzQ1IiB3aWR0aD0iMjMiIGhlaWdodD0iMTQiIC8+CiAgICAgICAgPC9icG1uZGk6QlBNTkxhY mVsPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJBY3Rpdm10eV8xaW10aHM5X2RpIiB icG1uRWxlbWVudD0iQWN0aXZpdHlfMWltdGhzOSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSIyMjYwIiB5PSIxMDAwIiB3aWR0aD0iMTAwI iBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE1OU2hhcGU+CiAgICAgIDxicG1uZGk6Q1BNT1NoYXB1IG1kPSJHYXR1d2F5XzB tYTZhOGhfZGkiIGJwbW5FbGVtZW50PSJHYXRld2F5XzByOGJhMDkiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iMjQ5NSIgeT0iMTAxNSIgd 2lkdGg9IjUwIiBoZWlnaHQ9IjUwIiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgPGRjOkJvdW5kcyB4PSIyNDE wIiB5PSI5NzMiIHdpZHRoPSI30SIgaGVpZ2h0PSI1MyIgLz4KICAgICAgICA8L2JwbW5kaTpCUE10TGFiZWw+CiAgICAgIDwvYnBtbmRpO kJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkFjdGl2aXR5XzE3bTg0NzhfZGkiIGJwbW5FbGVtZW50PSJBY3Rpdml 0eV8xN204NDc4Ij4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjI2ODAiIHk9IjEwMDAiIHdpZHRoPSIxMDAiIGhlaWdodD0i0DAiIC8+CiAgI CAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE1OU2hhcGUgaWQ9IkFjdGl2aXR5XzEwMG0xdWZfZGkiIGJwbW5FbGV tZW50PSJBY3Rpdml0eV8xMDBtMXVmIj4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjI2ODAiIHk9Ijg2MCIgd2lkdGg9IjEwMCIgaGVpZ2h0P SI4MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iQWN0aXZpdHlfMTRwdWpzb19





kaSIgYnBtbkVsZW1lbnQ9IkFjdGl2aXR5XzE0cHVqc28iPgogICAgICAgIDxkYzpCb3VuZHMgeD0iMjY4MCIgeT0iMTEyMCIgd2lkdGg9I jEwMCIgaGVpZ2h0PSI4MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iQWN0aXZ pdHlfMGdnOHExeV9kaSIgYnBtbkVsZW1lbnQ9IkFjdGl2aXR5XzEzc3B2ZTMiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iMjkyMCIgeT0iM TAWMCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRpOkJQTU5TaGF wZSBpZD0iRXZlbnRfMGI5c25yNV9kaSIgYnBtbkVsZW1lbnQ9IkV2ZW50XzBi0XNucjUiIGJpb2M6c3Ryb2tlPSJyZ2IoMjI5LCA1NywgN TMpIiBiaW9jOmZpbGw9InJnYigyNTUsIDIwNSwgMjEwKSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSIzMTYyIiB5PSIxMDIyIiB3aWR0aD0 iMzYiIGhlaWdodD0iMzYiIC8+CiAgICAgICAgPGJwbW5kaTpCUE1OTGFiZWw+CiAgICAgICAgICA8ZGM6Qm91bmRzIHg9IjMxNjkiIHk9I jEwNjUiIHdpZHRoPSIyMyIgaGVpZ2h0PSIxNCIgLz4KICAgICAgICA8L2JwbW5kaTpCUE1OTGFiZWw+CiAgICAgIDwvYnBtbmRpOkJQTU5 TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkV2ZW50XzB0d3o2MjBfZGkiIGJwbW5FbGVtZW50PSJFdmVudF8wdHd6NjIwI iBiaW9jOnN0cm9rZT0icmdiKDY3LCAxNjAsIDcxKSIgYmlvYzpmaWxsPSJyZ2IoMjAwLCAyMzAsIDIwMSkiPgogICAgICAgIDxkYzpCb3V uZHMgeD0iMTcyIiB5PSIxNjMyIiB3aWR0aD0iMzYiIGhlaWdodD0iMzYiIC8+CiAgICAgPCGJwbW5kaTpCUE1OTGFiZWw+CiAgICAgI CAgICA8ZGM6Qm91bmRzIHg9IjE1MCIgeT0iMTY3NSIgd2lkdGg9Ijg1IiBoZWlnaHQ9IjI3IiAvPgogICAgICAgIDwvYnBtbmRp0kJQTU5 MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRp0kJQTU5TaGFwZSBpZD0iQWN0aXZpdHlfMXF5cXp3Zl9ka SIgYnBtbkVsZW1lbnQ9IkFjdGl2aXR5XzFxeXF6d2YiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iMjYwIiB5PSIxNjEwIiB3aWR0aD0iMTA wIiBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJHYXRld2F5X zBv0Xl3bW1fZGkiIGJwbW5FbGVtZW50PSJHYXRld2F5XzF0cTVvNjAiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iNDE1IiB5PSIxNjI1IiB 3aWR0aD0iNTAiIGhlaWdodD0iNTAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9I kFjdGl2aXR5XzB0NmhienBfZGkiIGJwbW5FbGVtZW50PSJBY3Rpdml0eV8wdDZoYnpwIj4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjUyMCI geT0iMTYxMCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLz4KICAgICAgPC9icG1uZGk6Q1BNT1NoYXB1PgogICAgICA8YnBtbmRpOkJQT U5TaGFwZSBpZD0iR2F0ZXdheV8x0HVpZHlzX2RpIiBicG1uRWxlbWVudD0iR2F0ZXdheV8x0HVpZHlzIiBpc01hcmtlclZpc2libGU9InR ydWUiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iNjc1IiB5PSIxNjI1IiB3aWR0aD0iNTAiIGhlaWdodD0iNTAiIC8+CiAgICAgICAgPGJwb W5kaTpCUE1OTGFiZWw+CiAgICAgICAgICA8ZGM6Qm91bmRzIHg9IjcxNSIgeT0iMTU2NyIgd2lkdGg9Ijg5IiBoZWlnaHQ9IjY2IiAvPgo gICAgICAgIDwvYnBtbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZ D0iQWN0aXZpdHlfMXFxY2Q1bl9kaSIgYnBtbkVsZW1lbnQ9IkFjdGl2aXR5XzFxcWNkNW4iPgogICAgICAgIDxkYzpCb3VuZHMgeD0iMzk wIiB5PSIxNzcwIiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6Q lBNTlNoYXBlIGlkPSJBY3Rpdml0eV8wcnYzYW5xX2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMHJ2M2FucSI+CiAgICAgICAgPGRjOkJ vdW5kcyB4PSI1NjAiIHk9IjE0NjAiIHdpZHRoPSIxMDAiIGhlaWdodD0iODAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgI CAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkFjdGl2aXR5XzAxYWk2a2RfZGkiIGJwbW5FbGVtZW50PSJBY3Rpdml0eV8wMWFpNmtkIiBiaW9 jOnN0cm9rZT0iIzFlODhlNSIgYmlvYzpmaWxsPSIjYmJkZWZiIiBjb2xvcjpiYWNrZ3JvdW5kLWNvbG9yPSIjYmJkZWZiIiBjb2xvcjpib 3JkZXItY29sb3I9IiMxZTg4ZTUiPgogICAgICAgIDxkYzpCb3VuZHMgeD0i0DYwIiB5PSIxNjEwIiB3aWR0aD0iMTAwIiBoZWlnaHQ9Ijg wIiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJFdmVudF8xMjVnd2piX2RpIiBic G1uRWxlbWVudD0iRXZlbnRfMTI1Z3dqYiIgYmlvYzpzdHJva2U9IiNlNTM5MzUiIGJpb2M6ZmlsbD0iI2ZmY2RkMiIgY29sb3I6YmFja2d yb3VuZC1jb2xvcj0iI2ZmY2RkMiIgY29sb3I6Ym9yZGVyLWNvbG9yPSIjZTUzOTM1Ij4KICAgICAgICA8ZGM6Qm91bmRzIHg9Ijg2MiIge T0iMTcyMiIgd2lkdGg9IjM2IiBoZWlnaHQ9IjM2IiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgPGRj0kJvdW5 kcyB4PSI4NjkiIHk9IjE3NjUiIHdpZHRoPSIyMyIgaGVpZ2h0PSIxNCIgLz4KICAgICAgICA8L2JwbW5kaTpCUE1OTGFiZWw+CiAgICAgI DwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkdhdGV3YXlfMGd5NTR0eV9kaSIgYnBtbkVsZW1lbnQ 9IkdhdGV3YX1fMGd5NTR0eSIgaXNNYXJrZXJWaXNpYmxlPSJ0cnVlIj4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjU0NSIgeT0iMTc4NSIgd 2lkdGg9IjUwIiBoZWlnaHQ9IjUwIiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgPGRj0kJvdW5kcyB4PSI1MzY iIHk9IjE3NDAiIHdpZHRoPSI2NyIgaGVpZ2h0PSI0MCIgLz4KICAgICAgICA8L2JwbW5kaTpCUE1OTGFiZWw+CiAgICAgIDwvYnBtbmRpO kJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkFjdGl2aXR5XzBjbDY0OGVfZGkiIGJwbW5FbGVtZW50PSJBY3Rpdml 0eV8wY2w2NDhlIiBiaW9j0nN0cm9rZT0iIzFl0DhlNSIgYmlvYzpmaWxsPSIjYmJkZWZiIiBjb2xvcjpiYWNrZ3JvdW5kLWNvbG9yPSIjY mJkZWZiIiBjb2xvcjpib3JkZXItY29sb3I9IiMxZTg4ZTUiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iNjUwIiB5PSIxNzcwIiB3aWR0aD0 iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJBY3Rpd ml0eV8wZWFma250X2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMGVhZmtudCI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSI1MDAiIHk9IjE 5NDAiIHdpZHRoPSIxMDAiIGhlaWdodD@iODAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhc GUgaWQ9IkV2ZW50XzFlbG43MmhfZGkiIGJwbW5FbGVtZW50PSJFdmVudF8xZWxuNzJoIiBiaW9jOnN0cm9rZT0iI2U1MzkzNSIgYmlvYzp maWxsPSIjZmZjZGQyIiBjb2xvcjpiYWNrZ3JvdW5kLWNvbG9yPSIjZmZjZGQyIiBjb2xvcjpib3JkZXItY29sb3I9IiNlNTM5MzUiPgogI CAgICAgIDxkYzpCb3VuZHMgeD0iNjUyIiB5PSIxODYyIiB3aWR0aD0iMzYiIGhlaWdodD0iMzYiIC8+CiAgICAgICAgPGJwbW5kaTpCUE1 OTGFiZWw+CiAgICAgICAgICA8ZGM6Qm91bmRzIHg9IjY10SIgeT0iMTkwNSIgd2lkdGg9IjIzIiBoZWlnaHQ9IjE0IiAvPgogICAgICAgI DwvYnBtbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6Q1BNT1NoYXBlPgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iQ1BNT1N oYXB1XzA5aW1jNWkiIGJwbW5FbGVtZW50PSJFdmVudF8xZmM50XB5IiBiaW9jOnN0cm9rZT0icmdiKDIyOSwgNTcsIDUzKSIgYmlvYzpma WxsPSJyZ2IoMjU1LCAyMDUsIDIxMCkiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iMTMwMiIgeT0iMTM1MiIgd2lkdGg9IjM2IiBoZWlnaHQ 9IjM2IiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgPGRj0kJvdW5kcyB4PSIxMzA5IiB5PSIxMzk1IiB3aWR0a D0iMjMiIGhlaWdodD0iMTQiIC8+CiAgICAgICAgPC9icG1uZGk6QlBNTkxhYmVsPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICA gIDxicG1uZGk6Q1BNT1NoYXB1IG1kPSJUZXh0QW5ub3RhdG1vb18waTQzdzM5X2RpIiBicG1uRWx1bWVudD0iVGV4dEFubm90YXRpb25fM Gk0M3czOSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSI0NTAiIHk9IjI10TUiIHdpZHRoPSIxMDAiIGhlaWdodD0iMTI0IiAvPgogICAgICA 8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMTdqcm43el9kaSIgYnBtbkVsZW1lbnQ9IkZsb 3dfMTdqcm43eiI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjIwOCIgeT0iMTcwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIyNTA iIHk9IjE3MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMGJ2a3VrM19ka SIgYnBtbkVsZW1lbnQ9IkZsb3dfMGJ2a3VrMyI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjM1MCIgeT0iMTcwIiAvPgogICAgICAgIDx kaTp3YXlwb2ludCB4PSI0ODAiIHk9IjE3MCIgLz4KICAgICAgPC9icG1uZGk6Q1BNTkVkZ2U+CiAgICAgIDxicG1uZGk6Q1BNTkVkZ2Uga WQ9IkZsb3dfMWs3bXRocF9kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMWs3bXRocCI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjIwOCIgeT0 iNDUwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIyNjAiIHk9IjQ1MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgI DxicG1uZGk6Q1BNTkVkZ2UgaWQ91kZsb3dfMTA4MGx5aV9kaS1gYnBtbkVsZW11bnQ91kZsb3dfMTA4MGx5aS1+CiAg1CAg1CAgPGRpOnd heXBvaW50IHg9IjU4MCIgeT0iMTcwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI2MjUiIHk9IjE3MCIgLz4KICAgICAgPC9icG1uZ Gk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ91kZsb3dfMXZpeW82N19kaSIgYnBtbkVsZW11bnQ91kZsb3dfMXZpeW8 2NiI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjY1MCIgeT0iMTk1IiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI2NTAiIHk9IjI0M CIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNzgyIiB5PSIyNDAiIC8+CiAgICAgICAgPGJwbW5kaTpCUE10TGFiZWw+CiAgICAgICA





gICA8ZGM6Qm91bmRzIHg9IjY1NyIgeT0iMjE1IiB3aWR0aD0iMTciIGhlaWdodD0iMTQiIC8+CiAgICAgICAgPC9icG1uZGk6QlBNTkxhY mVsPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18xcmNsenBoX2RpIiBicG1uRWx lbWVudD0iRmxvd18xcmNsenBoIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNjMwIiB5PSI0MjUiIC8+CiAgICAgICAgPGRpOndheXBva W50IHg9IjYzMCIgeT0iMzkwIiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18 waDh4M3p0X2RpIiBicG1uRWxlbWVudD0iRmxvd18waDh4M3p0Ij4KICAgICAgICA8ZGK6d2F5cG9pbnQgeD0iNjMwIiB5PSIzMTAiIC8+C iAgICAgICAgPGRpOndheXBvaW50IHg9IjYzMCIgeT0iMTc1IiAvPgogICAgICA8L2JwbW5kaTpCUE1ORWRnZT4KICAgICAgPGJwbW5kaTp CUE10RWRnZSBpZD0iRmxvd18xcnU3MGRoX2RpIiBicG1uRWxlbWVudD0iRmxvd18xcnU3MGRoIj4KICAgICAgICA8ZGk6d2F5cG9pbnQge D0iNjc1IiB5PSIxNzAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9Ijc1MCIgeT0iMTcwIiAvPgogICAgICAgIDxicG1uZGk6Q1BNTkx hYmVsPgogICAgICAgICAgPGRj0kJvdW5kcyB4PSI20DkiIHk9IjE1MyIgd2lkdGg9IjIzIiBoZWlnaHQ9IjE0IiAvPgogICAgICAgIDwvY nBtbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMHo1MjB maV9kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMHo1MjBmaSI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjIwOCIgeT0iNjI3IiAvPgogICAgI CAgIDxkaTp3YXlwb2ludCB4PSIyNjAiIHk9IjYyNyIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkV kZ2UgaWQ9IkZsb3dfMHdvaDBqdF9kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMHdvaDBqdCI+CiAgICAgPGRpOndheXBvaW50IHg9IjM2M CIgeT0iNDUwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI2MDUiIHk9IjQ1MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiA gICAgIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMTRmZ3E3cV9kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMTRmZ3E3cSI+CiAgICAgICAgP GRpOndheXBvaW50IHg9IjY1NSIgeT0iNDUwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI3NDAiIHk9IjQ1MCIgLz4KICAgICAgPC9 icG1uZGk6Q1BNTkVkZ2U+CiAgICAgIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMTRjd2Uyb19kaSIgYnBtbkVsZW11bnQ9IkZsb3dfM TRjd2UybiI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjM2MCIgeT0iNjI3IiAvPgogICAgICAgIDxkaTp3YX1wb2ludCB4PSI0MTUiIHk 9IjYyNyIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMXR6OWc2d19kaSIgY nBtbkVsZW1lbnQ9IkZsb3dfMXR6OWc2dyI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjQ0MCIgeT0iNjUyIiAvPgogICAgICAgIDxkaTp 3YX1wb2ludCB4PSI0NDAiIHk9IjcxMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNTIyIiB5PSI3MTAiIC8+CiAgICAgICAgPGJwb W5kaTpCUE10TGFiZWw+CiAgICAgICAgICA8ZGM6Qm91bmRzIHg9IjQ00CIgeT0iNjc4IiB3aWR0aD0iMTUiIGhlaWdodD0iMTQiIC8+CiA gICAgICAgPC9icG1uZGk6Q1BNTkxhYmVsPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iR mxvd18wd2dlZng5X2RpIiBicG1uRWxlbWVudD0iRmxvd18wd2dlZng5Ij4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNDY1IiB5PSI2Mjc iIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjYwNSIgeT0iNjI3IiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwb W5kaTpCUE10RWRnZSBpZD0iRmxvd18xMXJ4eDFlX2RpIiBicG1uRWxlbWVudD0iRmxvd18xMXJ4eDFlIj4KICAgICAgICA8ZGk6d2F5cG9 pbnQgeD0iNjU1IiB5PSI2MjciIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9Ijc0MCIgeT0iNjI3IiAvPgogICAgICA8L2JwbW5kaTpCU E10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18wczExcXkyX2RpIiBicG1uRWxlbWVudD0iRmxvd18wczExcXkyIj4 KICAgICAgICA8ZGK6d2F5cG9pbnQgeD0iODQwIiB5PSI0NTAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjkyNSIgeT0iNDUwIiAvP gogICAgICA8L2JwbW5kaTpCUE1ORWRnZT4KICAgICAgPGJwbW5kaTpCUE1ORWRnZSBpZD0iRmxvd18xbGVwNzU5X2RpIiBicG1uRWxlbWV udD0iRmxvd18xbGVwNzU5Ij4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iODQwIiB5PSI2MjciIC8+CiAgICAgICAgPGRpOndheXBvaW50I Hg9IjkzMCIgeT0iNjI3IiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI5MzAiIHk9IjQ1NSIgLz4KICAgICAgPC9icG1uZGk6Q1BNTkV kZ2U+CiAgICAgIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMDVyYWU0cF9kaSIgYnBtbkVsZW11bnQ9IkZsb3dfMDVyYWU0cCI+CiAgI ${\tt CAgICAgPGRpOndheXBvaW50IHg9Ijk1MCIgeT0iNDc11iAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI5NTAiIHk9IjUxMCIgLz4KICAllored and {\tt CAgICAgPGRpOndheXBvaW50IHg9Ijk1MCIgeLz4KICAllored and {\tt CAgICAgPGRpOndheXBvaW50IHg9Ijk1MCIgeLz4K$ gICAgICA8ZGk6d2F5cG9pbnQgeD0iMTAxMiIgeT0iNTEwIiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgPGRjO kJvdW5kcyB4PSI5NTEiIHk9IjQ5MCIgd2lkdGg9IjE1IiBoZWlnaHQ9IjE0IiAvPgogICAgICAgIDwvYnBtbmRpOkJQTU5MYWJlbD4KICA gICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMG9zajNval9kaSIgYnBtbkVsZW1lbnQ9I kZsb3dfMG9zajNvaiI+CiAgICAgICAgPGRpOndheXBvaW50IHg9Ijk3NSIgeT0iNDUwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI xMTUwIiB5PSI0NTAiIC8+CiAgICAgICAgPGJwbW5kaTpCUE10TGFiZWw+CiAgICAgICAgICA8ZGM6Qm91bmRzIHg9IjEwNTQiIHk9IjQzM iIgd2lkdGg9IjE4IiBoZWlnaHQ9IjE0IiAvPgogICAgICAgIDwvYnBtbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U +CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMHJseTYwbF9kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMHJseTYwbCI+CiAgICAgI CAgPGRpOndheXBvaW50IHg9IjYzMCIgeT0iNjUyIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI2MzAiIHk9IjcxMCIgLz4KICAgICA gICA8ZGk6d2F5cG9pbnQgeD0iMTAwMCIgeT0iNzEwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxMDAwIiB5PSI2NjciIC8+CiAgI CAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzA0NG8ycmdfZGkiIGJwbW5FbGVtZW50PSJ GbG93XzA0NG8ycmciPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxMDUwIiB5PSI2MjciIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9I jEwNzUiIHk9IjYyNyIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMTN3ZnM CAgIDxkaTp3YXlwb2ludCB4PSIyNjAiIHk9IjgyMCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkV kZ2UgaWQ9IkZsb3dfMWp2eXFuY19kaSIgYnBtbkVsZW11bnQ9IkZsb3dfMWp2eXFuYiI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjM2M CIgeT0iODIwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI0MjAiIHk9IjgyMCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiA gICAgIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMDhubGR1a19kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMDhubGR1ayI+CiAgICAgICAgP GRpOndheXBvaW50IHg9IjUyMCIgeT0iODIwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI3MDAiIHk9IjgyMCIgLz4KICAgICAgPC9 icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMTkzZXlsd19kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfM TkzZXlsdyI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjEyNTAiIHk9IjYyNyIgLz4KICAgICAgICA8ZGK6d2F5cG9pbnQgeD0iMTMwNSI geT0iNjI3IiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18wYTFpb3N6X2RpI iBicG1uRWxlbWVudD0iRmxvd18wYTFpb3N6Ij4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iODAwIiB5PSI4MjAiIC8+CiAgICAgICAgPGR pOndheXBvaW50IHg9IjEzMTAiIHk9IjgyMCIgLz4KICAgICAgICA8ZGK6d2F5cG9pbnQgeD0iMTMxMCIgeT0iNjMyIiAvPgogICAgICA8L 2JwbW5kaTpCUE1ORWRnZT4KICAgICAgPGJwbW5kaTpCUE1ORWRnZSBpZD0iRmxvd18xcDRrMjkyX2RpIiBicG1uRWxlbWVudD0iRmxvd18 xcDRrMjkyIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTM1NSIgeT0iNjI3IiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxNDEwI iB5PSI2MjciIC8+CiAgICAgICAgPGJwbW5kaTpCUE1OTGFiZWw+CiAgICAgICAgICA8ZGM6Qm91bmRzIHg9IjEzNzQiIHk9IjYwOSIgd2l kdGg9IjE4IiBoZWlnaHQ9IjE0IiAvPgogICAgICAgIDwvYnBtbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgI CAgIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMTIxOThrZV9kaSIgYnBtbkVsZW11bnQ9IkZsb3dfMTIxOThrZSI+CiAgICAgICAgPGR pOndheXBvaW50IHg9IjExMjUiIHk9IjYyNyIgLz4KICAgICAgICA8ZGK6d2F5cG9pbnQgeD0iMTE1MCIgeT0iNjI3IiAvPgogICAgICA8L 2JwbW5kaTpCUE1ORWRnZT4KICAgICAgPGJwbW5kaTpCUE1ORWRnZSBpZD0iRmxvd18xcXdpa3ZjX2RpIiBicG1uRWxlbWVudD0iRmxvd18 xcXdpa3ZjIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTMzMCIgeT0iNjUyIiAvPgogICAgICAgIDxkaTp3YX1wb2ludCB4PSIxMzMwI iB5PSI3MDAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjE0NDIiIHk9IjcwMCIgLz4KICAgICAGICA8YnBtbmRpOkJQTU5MYWJlbD4 KICAgICAgICAgIDxkYzpCb3VuZHMgeD0iMTMzOCIgeT0iNjczIiB3aWR0aD0iMTUiIGhlaWdodD0iMTQiIC8+CiAgICAgICAgPC9icG1uZ Gk6Q1BNTkxhYmVsPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18xcDJ20HNiX2R





pIiBicG1uRWxlbWVudD0iRmxvd18xcDJ2OHNiIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjA4IiB5PSI50DAiIC8+CiAgICAgICAgP GRpOndheXBvaW50IHg9IjI2MCIgeT0iOTgwIiAvPgogICAgICA8L2JwbW5kaTpCUE1ORWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSB pZD0iRmxvd18xbTQycW5zX2RpIiBicG1uRWxlbWVudD0iRmxvd18xbTQycW5zIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMzYwIiB5P SI50DAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjQ0NSIgeT0i0TgwIiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICA gPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18xcHMxczlvX2RpIiBicG1uRWxlbWVudD0iRmxvd18xcHMxczlvIj4KICAgICAgICA8ZGk6d 2F5cG9pbnQgeD0iNDk1IiB5PSI5ODAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjU2MCIgeT0iOTgwIiAvPgogICAgICA8L2JwbW5 kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18weW83eDEyX2RpIiBicG1uRWxlbWVudD0iRmxvd18weW83e DEyIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNjYwIiB5PSI50DAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9Ijc0NSIgeT0iOTg WxlbWVudD0iRmxvd18xdTVkZXBzIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNzk1IiB5PSI50DAiIC8+CiAgICAgICAgPGRpOndheXB vaW50IHg9IjkzMCIgeT0iOTgwIiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgPGRjOkJvdW5kcyB4PSI4NDEiI Hk9Ijk2MyIgd2lkdGg9IjE4IiBoZWlnaHQ9IjE0IiAvPgogICAgICAgIDwvYnBtbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlB NTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMHljbGp3NF9kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMHljbGp3NCI+C iAgICAgICAgPGRpOndheXBvaW50IHg9Ijc3MCIgeT0iMTAwNSIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNzcwIiB5PSIxMDcwIiA vPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI4OTIiIHk9IjEwNzAiIC8+CiAgICAgICAgPGJwbW5kaTpCUE1OTGFiZWw+CiAgICAgICAgI CA8ZGM6Qm91bmRzIHg9IjY50SIgeT0iMTAzOCIgd2lkdGg9IjYzIiBoZWlnaHQ9IjE0IiAvPgogICAgICAgIDwvYnBtbmRpOkJQTU5MYWJ lbD4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMGJqd282dl9kaSIgYnBtbkVsZ W1lbnQ9IkZsb3dfMGJqd282diI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjQ3MCIgeT0iMTAwNSIgLz4KICAgICAgICAgICA8ZGk6d2F5cG9 pbnQgeD0iNDcwIiB5PSIxMTQwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxMTMwIiB5PSIxMTQwIiAvPgogICAgICA8L2JwbW5ka TpCUE1ORWRnZT4KICAgICAgPGJwbW5kaTpCUE1ORWRnZSBpZD0iRmxvd18xbGs1djB4X2RpIiBicG1uRWxlbWVudD0iRmxvd18xbGs1djB 4Ij4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjA4IiB5PSIxMjkwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIyNjAiIHk9IjEyO TAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzF5NW5oYjhfZGkiIGJwbW5 FbGVtZW50PSJGbG93XzF5NW5oYjgiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIzNjAiIHk9IjEy0TAiIC8+CiAgICAgICAgPGRpOndhe XBvaW50IHg9IjQyNSIgeT0iMTI5MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZ sb3dfMHgyNnhjYV9kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMHgyNnhjYSI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjQ3NSIgeT0iMTI5M CIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNTg1IiB5PSIxMjkwIiAvPgogICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICA gICAgPGRjOkJvdW5kcyB4PSI1NDkiIHk9IjEyNzIiIHdpZHRoPSIxOCIgaGVpZ2h0PSIxNCIgLz4KICAgICAgICA8L2JwbW5kaTpCUE1OT GFiZWw+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzA5N2UzbWFfZGkiIGJwbW5 FbGVtZW50PSJGbG93XzA5N2UzbWEiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI0NTAiIHk9IjEzMTUiIC8+CiAgICAgICAgPGRpOndhe XBvaW50IHg9IjQ1MCIgeT0iMTQwMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNTEyIiB5PSIxNDAwIiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgPGRjOkJvdW5kcyB4PSI0NTgiIHk9IjEzNTEiIHdpZHRoPSIxNSIgaGVpZ2h0PSIxNCIgLz4KI CAgICAgICA8L2JwbW5kaTpCUE10TGFiZWw+CiAgICAgIDwvYnBtbmRp0kJQTU5FZGdlPgogICAgICA8YnBtbmRp0kJQTU5FZGdlIGlkPSJ GbG93XzEyZ3p6bzhfZGkiIGJwbW5FbGVtZW50PSJGbG93XzEyZ3p6bzgiPgogICAgICxgIDxkaTp3YXlwb2ludCB4PSI2MjAiIHk9IjEzM DUiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjYyMCIgeT0iMTQzMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNzUwIiB5PSI xNDMwIiAvPgogICAgICA8L2JwbW5kaTpCUE1ORWRnZT4KICAgICAgPGJwbW5kaTpCUE1ORWRnZSBpZD0iRmxvd18wNWd4bnNsX2RpIiBic G1uRWxlbWVudD0iRmxvd18wNWd4bnNsIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNjM1IiB5PSIxMjkwIiAvPgogICAgICAgIDxkaTp 3YX1wb2ludCB4PSI3NTAiIHk9IjEyOTAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkP SJGbG93XzFndzV4bDVfZGkiIGJwbW5FbGVtZW50PSJGbG93XzFndzV4bDUiPgogICAgICAgIDxkaTp3YX1wb2ludCB4PSI4NTAiIHk9IjE yOTAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9Ijk1MCIgeT0iMTI5MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgI DxicG1uZGk6Q1BNTkVkZ2UgaWQ91kZsb3dfMWMyYW9icV9kaS1gYnBtbkVsZW11bnQ91kZsb3dfMWMyYW9icSI+CiAg1CAgPGRpOnd heXBvaW50IHg9IjEwNTAiIHk9IjEyOTAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjExNTUiIHk9IjEyOTAiIC8+CiAgICAgIDwvY nBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzFmMHJ1M2NfZGkiIGJwbW5FbGVtZW50PSJGbG93XzF iB5PSIxMjY1IiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18wb2tjYzR6X2R pIiBicG1uRWxlbWVudD0iRmxvd18wb2tjYzR6Ij4KICAgICAgICA8ZGK6d2F5cG9pbnQgeD0iMTIwNSIgeT0iMTI5MCIgLz4KICAgICAgI CA8ZGk6d2F5cG9pbnQgeD0iMTQwMCIgeT0iMTI5MCIgLz4KICAgICAgICA8YnBtbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3V uZHMgeD0iMTI5NCIgeT0iMTI3MiIgd2lkdGg9IjE4IiBoZWlnaHQ9IjE0IiAvPgogICAgICAgIDwvYnBtbmRp0kJQTU5MYWJlbD4KICAgI CAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMW1odG1kN19kaSIgYnBtbkVsZW1lbnQ9IkZ sb3dfMW1odGlkNyI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjIxOCIgeT0iMjQyMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iM zAwIiB5PSIyNDIwIiAvPgogICAgICA8L2JwbW5kaTpCUE1ORWRnZT4KICAgICAgPGJwbW5kaTpCUE1ORWRnZSBpZD0iRmxvd18wZ3M3cHJ iX2RpIiBicG1uRWxlbWVudD0iRmxvd18wZ3M3cHJiIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNDAwIiB5PSIyNDIwIiAvPgogICAgI CAgIDxkaTp3YXlwb2ludCB4PSI1MDUiIHk9IjI0MjAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5 FZGdlIGlkPSJGbG93XzB0djA4NGpfZGkiIGJwbW5FbGVtZW50PSJGbG93XzB0djA4NGoiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI1N TUiIHk9IjI0MjAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9Ijk5MCIgeT0iMjQyMCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U +CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMHA3Zjd0M19kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMHA3Zjd0MyI+CiAgICAgI CAgPGRpOndheXBvaW501Hg91jUzMCIgeT0iMjQ0NSIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNTMwIiB5PSIyNTMwIiAvPgogICA gICAgIDxkaTp3YXlwb2ludCB4PSI2MDAiIHk9IjI1MzAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQT U5FZGdlIGlkPSJGbG93XzFvcW9lem5fZGkiIGJwbW5FbGVtZW50PSJGbG93XzFvcW9lem4iPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI 3MDAiIHk9IjI1MzAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjExOTUiIHk9IjI1MzAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZ GdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzF2b2trNHpfZGkiIGJwbW5FbGVtZW50PSJGbG93XzF2b2trNHoiPgogICA gICAgIDxkaTp3YXlwb2ludCB4PSIxMjQ1IiB5PSIyNTMwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxMzQwIiB5PSIyNTMwIiAvP gogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgPGRj0kJvdW5kcyB4PSIxMjg0IiB5PSIyNTEyIiB3aWR0aD0iMTgiIGh laWdodD0iMTQiIC8+CiAgICAgICAgPC9icG1uZGk6QlBNTkxhYmVsPgogICAgICA8L2JwbW5kaTpCUE1ORWRnZT4KICAgICAgPGJwbW5ka TpCUE1ORWRnZSBpZD0iRmxvd18xYmJiN2tkX2RpIiBicG1uRWxlbWVudD0iRmxvd18xYmJiN2tkIj4KICAgICAgICA8ZGk6d2F5cG9pbnQ geD0iMTIyMCIgeT0iMjU1NSIgLz4KICAgICAgICA8ZGK6d2F5cG9pbnQgeD0iMTIyMCIgeT0iMjYxMCIgLz4KICAgICAgICA8ZGK6d2F5c G9pbnQgeD0iMTI4MiIgeT0iMjYxMCIgLz4KICAgICAgICA8YnBtbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3VuZHMgeD0iMTI y O C I g e T 0 i M j U 4 M C I g d 2 l k d G g 9 I j E 1 I i B o Z W l n a H Q 9 I j E 0 I i A V P g o g I C A g I D W V Y n B t b m R p 0 k J Q T U 5 M Y W J I b D 4 K I C A g I C A g P C 9 i c G 1 u Z G I u Z G I D W V Y n B t b m R p 0 k J Q T U 5 M Y W J I b D 4 K I C A g I C A g P C 9 i c G 1 u Z G I u Z G I C A g IGk6Q1BNTkVkZ2U+CiAgICAgIDxicG1uZGk6Q1BNTkVkZ2UgaWQ91kZsb3dfMGRsOXlic19kaSIgYnBtbkVsZW11bnQ91kZsb3dfMGRsOXl





iciI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjIxOCIgeT0iMjEwMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjkwIiB5PSIyM TAwIiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18xY2s4cGo4X2RpIiBicG1 Xlwb2ludCB4PSI1MjUiIHk9IjIxMDAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJ GbG93XzF0MWFiZDVfZGkiIGJwbW5FbGVtZW50PSJGbG93XzF0MWFiZDUiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI1NTAiIHk9IjIxM jUiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjU1MCIgeT0iMjIxMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNjMwIiB5PSI y MjEwIiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18wamQ3aW1sX2RpIiBic3YXlwb2ludCB4PSIxMTY1IiB5PSIyMjEwIiAvPgogICAgICA8L2JwbW5kaTpCUE1ORWRnZT4KICAgICAgPGJwbW5kaTpCUE1ORWRnZSBpZ D0iRmxvd18wbTVoMTVjX2RpIiBicG1uRWxlbWVudD0iRmxvd18wbTVoMTVjIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTIxNSIgeT0 iMjIxMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTM2MCIgeT0iMjIxMCIgLz4KICAgICAgICA8YnBtbmRpOkJQTU5MYWJlbD4KI CAgICAgICAgIDxkYzpCb3VuZHMgeD0iMTI3OSIgeT0iMjE5MiIgd2lkdGg9IjE4IiBoZWlnaHQ9IjE0IiAvPgogICAgICAgIDwvYnBtbmR pOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMGh3dGdtY19ka SIgYnBtbkVsZW1lbnQ9IkZsb3dfMGh3dGdtYyI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjExOTAiIHk9IjIyMzUiIC8+CiAgICAgICA gPGRpOndheXBvaW50IHg9IjExOTAiIHk9IjIzMjAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjEyNzIiIHk9IjIzMjAiIC8+CiAgI CAgICAgPGJwbW5kaTpCUE10TGFiZWw+CiAgICAgICAgICA8ZGM6Qm91bmRzIHg9IjEyMDIiIHk9IjIyNDMiIHdpZHRoPSIxNSIgaGVpZ2h 0PSIxNCIgLz4KICAgICAgICA8L2JwbW5kaTpCUE10TGFiZWw+CiAgICAgIDwvYnBtbmRp0kJQTU5FZGdlPgogICAgICA8YnBtbmRp0kJQT U5FZGdlIGlkPSJGbG93XzB2ZWUwNDZfZGkiIGJwbW5FbGVtZW50PSJGbG93XzB2ZWUwNDYiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI 4NTAiIHk9IjE3MCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMTcwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4P jM3hyX2RpIiBicG1uRWxlbWVudD0iRmxvd18wc3FjM3hyIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTI1MCIgeT0iNDUwIiAvPgogI CAgICAgIDxkaTp3YXlwb2ludCB4PSIyMzMwIiB5PSI0NTAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjIzMzAiIHk9IjEwMDAiIC8 + CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzFtMXJycGpfZGkiIGJwbW5FbGVtZW50PSJGbG93XzFtMXJycGoiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxMTAwIiB5PSI2MDIiIC8+CiAgICAgICAgPGRpOndheXBvaW5 @IHg9IjExMDAiIHk9IjUyMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD@iMjMxMCIgeT@iNTIwIiAvPgogICAgICAgIDxkaTp3YXlwb 2ludCB4PSIyMzEwIiB5PSIxMDAwIiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmx vd18xZjlkbDJtX2RpIiBicG1uRWxlbWVudD0iRmxvd18xZjlkbDJtIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTUxMCIgeT0iNjI3I iAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIyMjgwIiB5PSI2MjciIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjIyODAiIHk9IjE W5FbGVtZW50PSJGbG93XzFvNXkwb3UiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI4NTAiIHk9IjE0MzAiIC8+CiAgICAgICAgPGRpOnd heXBvaW50IHg9IjE4OTAiIHk9IjE0MzAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjE4OTAiIHk9IjEwNjAiIC8+CiAgICAgICAgP GRpOndheXBvaW50IHg9IjIyNjAiIHk9IjEwNjAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGd lIGlkPSJGbG93XzF3eDIycGVfZGkiIGJwbW5FbGVtZW50PSJGbG93XzF3eDIycGUiPgogICAgICAgIDxkaTp3YX1wb2ludCB4PSIxNTAwI iB5PSIxMjkwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxODc1IiB5PSIxMjkwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI xODc1IiB5PSIxMDQwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIyMjYwIiB5PSIxMDQwIiAvPgogICAgICA8L2JwbW5kaTpCUE1OR WRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18xd3UxZW8yX2RpIiBicG1uRWxlbWVudD0iRmxvd18xd3UxZW8yIj4KICA gICAgICA8ZGk6d2F5cG9pbnQgeD0iMTAzMCIgeT0iOTgwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxOTAwIiB5PSI5ODAiIC8+C iAgICAgICAgPGRpOndheXBvaW50IHg9IjE5MDAiIHk9IjEwMjAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjIyNjAiIHk9IjEwMjA iIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzFrbWRqaGJfZGkiIGJwbW5Fb GVtZW50PSJGbG93XzFrbWRqaGIiPgogICAgICAgIDxkaTp3YX1wb2ludCB4PSIxMDkwIiB5PSIyNDIwIiAvPgogICAgICAgIDxkaTp3YX1 wb2ludCB4PSIyMzQwIiB5PSIyNDIwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIyMzQwIiB5PSIxMDgwIiAvPgogICAgICA8L2Jwb W5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18xNDE0bDY5X2RpIiBicG1uRWxlbWVudD0iRmxvd18xNDE $\tt 0bDY5Ij4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTQ0MCIgeT0iMjUzMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMjUzMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMjUzMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMjUzMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMjUzMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMjUzMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMjUzMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMjUzMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMjUzMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMjUzMCIgLz4KICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMjUzMCIgLz4KICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMjUzMCIgLz4KICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMjUzMCIgLz4KICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMjUzMCIgLz4KICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMjUzMCIgLz4KICAgICA8ZGk6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMjUzMCigeT0iMjUzMCigeT0iMjUzMCigeT0iMjUzMCige$ T0iMjUzMCIgLz4KICAgICAgICA8ZGK6d2F5cG9pbnQgeD0iMjM1MCIgeT0iMTA4MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiA gICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMGNlYWkxb19kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMGNlYWkxbyI+CiAgICAgICAgP GRpOndheXBvaW50IHg9Ijg5MCIgeT0iMjEwMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjMxMCIgeT0iMjEwMCIgLz4KICAgICA gICA8ZGk6d2F5cG9pbnQgeD0iMjMxMCIgeT0iMTA4MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNT kVkZ2UgaWQ9IkZsb3dfMTMwb3Z3bV9kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMTMwb3Z3bSI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjE 0NjAiIHk9IjIyMTAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjIzMjAiIHk9IjIyMTAiIC8+CiAgICAgICAgPGRpOndheXBvaW50I Hg9IjIzMjAiIHk9IjEwODAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzF gogICAgICAgIDxkaTp3YXlwb2ludCB4PSIyNDk1IiB5PSIxMDQwIiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5 kaTpCUE10RWRnZSBpZD0iRmxvd18xeTJrMHYzX2RpIiBicG1uRWxlbWVudD0iRmxvd18xeTJrMHYzIj4KICAgICAgICA8ZGk6d2F5cG9pb nQgeD0iMjU0NSIgeT0iMTA0MCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjY4MCIgeT0iMTA0MCIgLz4KICAgICA8JCA8YnBtbmR pOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3VuZHMgeD0iMjU3MiIgeT0iMTAwNiIgd2lkdGg9IjgzIiBoZWlnaHQ9IjI3IiAvPgogI CAgICAgIDwvYnBtbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZ sb3dfMGczZn10ZF9kaSIgYnBtbkVsZW11bnQ9IkZsb3dfMGczZn10ZCI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjI1MjAiIHk9IjEwM TUiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjI1MjAiIHk9IjkwMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjY4MCIgeT0 iOTAwIiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgPGRjOkJvdW5kcyB4PSIyNTcyIiB5PSI4NzMiIHdpZHRoP SI4MyIgaGVpZ2h0PSIyNyIgLz4KICAgICAgICA8L2JwbW5kaTpCUE1OTGFiZWw+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA 8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzBqcG44ajJfZGkiIGJwbW5FbGVtZW50PSJGbG93XzBqcG44ajIiPgogICAgICAgIDxkaTp3Y Xlwb2ludCB4PSIyNTIwIiB5PSIxMDY1IiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIyNTIwIiB5PSIxMTYwIiAvPgogICAgICAgIDx kaTp3YXlwb2ludCB4PSIyNjgwIiB5PSIxMTYwIiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgPGRjOkJvdW5kc yB4PSIyNTg0IiB5PSIxMTMzIiB3aWR0aD0iNTkiIGhlaWdodD0iMjciIC8+CiAgICAgICAgPC9icG1uZGk6QlBNTkxhYmVsPgogICAgICA 8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18xNzR1N3MyX2RpIiBicG1uRWxlbWVudD0iRmxvd 18xNzR1N3MyIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjc4MCIgeT0iMTA0MCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjk y MCIgeT0iMTA0MCIgLz4KICAgICAgPC9icG1uZGk6Q1BNTkVkZ2U+CiAgICAgIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAKAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAM5AGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAGIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAGIDxicG1uZGk6Q1bNTkVkZ2UgaWQ9IkZsb3dfMWF6aXM5YAGIDxicG1uZGk6Q1bNTkVkZ2UgaWQ9IkZsb3dfMWfaxAgutAgaWqfMWfaxAgutAgaWqfMWfaxAgutAgaWqfMWfaxAgutAgaWqfMWfaxAgutAgaWqfMWfaxAgutAgaWqfMWfaxAgutAgaWqfMWfaxAgutAgaWqfMWfaxAgutAgaWqfMWfaxAgaWqfMWfaxAgaWqfWfaxAgaWqffWfaxAga19kaSIgYnBtbkVsZW11bnQ9IkZsb3dfMWF6aXM5YiI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjI30DAiIHk9IjkwMCIgLz4KICAgICA





gICA8ZGk6d2F5cG9pbnQgeD0iMjg1MCIgeT0iOTAwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIyODUwIiB5PSIxMDEwIiAvPgogI CAgICAgIDxkaTp3YXlwb2ludCB4PSIyOTIwIiB5PSIxMDEwIiAvPgogICAgICA8L2JwbW5kaTpCUE1ORWRnZT4KICAgICAgPGJwbW5kaTp CUE10RWRnZSBpZD0iRmxvd18xZzRjeDh6X2RpIiBicG1uRWxlbWVudD0iRmxvd18xZzRjeDh6Ij4KICAgICAgICA8ZGk6d2F5cG9pbnQge D0iMjc4MCIgeT0iMTE2MCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjg1MCIgeT0iMTE2MCIgLz4KICAgICAgICA8ZGk6d2F5cG9 pbnQgeD0iMjg1MCIgeT0iMTA3MCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjkyMCIgeT0iMTA3MCIgLz4KICAgICAgPC9icG1uZ Gk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMDc4djU1a19kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMDc4djU 1ayI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjMwMjAiIHk9IjEwNDAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjMxNjIiIHk9I jEwNDAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzByc2F1a3RfZGkiIGJ wbW5FbGVtZW50PSJGbG93XzByc2F1a3QiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIyMDgiIHk9IjE2NTAiIC8+CiAgICAgICAgPGRpO ndheXBvaW50IHg9IjI2MCIgeT0iMTY1MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ 9IkZsb3dfMDJnczB1b19kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMDJnczB1byI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjM2MCIgeT0iM TY1MCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNDE1IiB5PSIxNjUwIiAvPgogICAgICA8L2JwbW5kaTpCUE1ORWRnZT4KICAgICA gPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18wcno2b3Q5X2RpIiBicG1uRWxlbWVudD0iRmxvd18wcno2b3Q5Ij4KICAgICAgICA8ZGk6d 2F5cG9pbnQgeD0iNDY1IiB5PSIxNjUwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI1MjAiIHk9IjE2NTAiIC8+CiAgICAgIDwvYnB tbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzFkbDB0NGlfZGkiIGJwbW5FbGVtZW50PSJGbG93XzFkb DB0NGkiPgogICAgICAgIDxkaTp3YX1wb2ludCB4PSI2MjAiIHk9IjE2NTAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjY3NSIgeT0 iMTY1MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMTBqc3BucF9kaSIgY nBtbkVsZW11bnQ9IkZsb3dfMTBqc3BucCI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjQ0MCIgeT0iMTY3NSIgLz4KICAgICAgICA8ZGk 6d2F5cG9pbnQgeD0iNDQwIiB5PSIxNzcwIiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZ D0iRmxvd18xdWJidWt1X2RpIiBicG1uRWxlbWVudD0iRmxvd18xdWJidWt1Ij4KICAgICAgICA8ZGK6d2F5cG9pbnQgeD0iNjEWIiB5PSI xMzE1IiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI2MTAiIHk9IjE0NjAiIC8+CiAgICAgIDwvYnBtbmRp0kJQTU5FZGdlPgogICAgI CA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzFtNTdrNjBfZGkiIGJwbW5FbGVtZW50PSJGbG93XzFtNTdrNjAiPgogICAgICAgIDxkaTp 3YX1wb2ludCB4PSI2NjAiIHk9IjE1MDAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjcwMCIgeT0iMTUwMCIgLz4KICAgICAgICA8Z Gk6d2F5cG9pbnQgeD0iNzAwIiB5PSIxNjI1IiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSB pZD0iRmxvd18wc2NsNmt0X2RpIiBicG1uRWx1bWVudD0iRmxvd18wc2NsNmt0Ij4KICAgICAgICAgZGk6d2F5cG9pbnQgeD0iNzI1IiB5Packers and the context of the conSIxNjUwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI4NjAiIHk9IjE2NTAiIC8+CiAgICAgICAgPGJwbW5kaTpCUE1OTGFiZWw+CiA gICAgICAgICA8ZGM6Qm91bmRzIHg9Ijc4NCIgeT0iMTYzMiIgd2lkdGg9IjE4IiBoZWlnaHQ9IjE0IiAvPgogICAgICAgIDwvYnBtbmRpO kJQTU5MYWJ1bD4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMHE2aDNqOV9kaSI gYnBtbkVsZW1lbnQ9IkZsb3dfMHE2aDNqOSI+CiAgICAgICAgPGRpOndheXBvaW50IHg9Ijk2MCIgeT0iMTY1MCIgLz4KICAgICAgICA8Z gPC9icG1uZGk6Q1BNTkVkZ2U+CiAgICAgIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMH10NG84N19kaSIgYnBtbkVsZW11bnQ9IkZsb 3dfMHl0NG84NyI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjcwMCIgeT0iMTY3NSIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNzA wIiB5PSIxNzQwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI4NjIiIHk9IjE3NDAiIC8+CiAgICAgICAgPGJwbW5kaTpCUE10TGFiZ Ww+CiAgICAgICAgICABZGM6Qm91bmRzIHg9IjcwOCIgeT0iMTcwNCIgd2lkdGg9IjE1IiBoZWlnaHQ9IjE0IiAvPgogICAgICAgIDwvYnB tbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMHZqaHJva V9kaSIgYnBtbkVsZW11bnQ9IkZsb3dfMHZqaHJvaSI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjQ5MCIgeT0iMTgxMCIgLz4KICAgICA gICA8ZGk6d2F5cG9pbnQgeD0iNTQ1IiB5PSIxODEwIiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10R 1IiB5PSIxODEwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI2NTAiIHk9IjE4MTAiIC8+CiAgICAgICAgPGJwbW5kaTpCUE1OTGFiZ Ww+CiAgICAgICAgICABZGM6Qm91bmRzIHg9IjYxMSIgeT0iMTc5MyIgd2lkdGg9IjE4IiBoZWlnaHQ9IjE0IiAvPgogICAgICAgIDwvYnB tbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMW55bm13M 19kaSIgYnBtbkVsZW11bnQ9IkZsb3dfMW55bml3MyI+CiAgICAgICAgPGRpOndheXBvaW50IHg9Ijc1MCIgeT0iMTgxMCIgLz4KICAgICA gICA8ZGk6d2F5cG9pbnQgeD0iMjI5MCIgeT0iMTgxMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMjI5MCIgeT0iMTA4MCIgLz4KI CAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMGVtMWVzbF9kaSIgYnBtbkVsZW1lbnQ 9IkZsb3dfMGVtMWVzbCI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjU1MCIgeT0iMTk0MCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQge D0iNTUwIiB5PSIxODE1IiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18wYms 4ajlmX2RpIiBicG1uRWxlbWVudD0iRmxvd18wYms4ajlmIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNTcwIiB5PSIxODM1IiAvPgogI CAgICAgIDxkaTp3YXlwb2ludCB4PSI1NzAiIHk9IjE4ODAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjY1MiIgeT0iMTg4MCIgLz4 KICAgICAgICA8YnBtbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3VuZHMgeD0iNTc4IiB5PSIxODUzIiB3aWR0aD0iMTUiIGhla WdodD@iMTQiIC8+CiAgICAgICAgPC9icG1uZGk6Q1BNTkxhYmVsPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTp CUE10RWRnZSBpZD0iRmxvd18xeHEzM3Y3X2RpIiBicG1uRWxlbWVudD0iRmxvd18xeHEzM3Y3Ij4KICAgICAgICA8ZGk6d2F5cG9pbnQge D0iNTc1IiB5PSIyMTAwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI3OTAiIHk9IjIxMDAiIC8+CiAgICAgIDwvYnBtbmRp0kJQTU5 FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzE1MGF3MndfZGkiIGJwbW5FbGVtZW50PSJGbG93XzE1MGF3MnciPgogI CAgICAgIDxkaTp3YXlwb2ludCB4PSI1NTAiIHk9IjIwNzUiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjU1MCIgeT0iMjAyMCIgLz4 KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMGlscjg1Z19kaSIgYnBtbkVsZW1lb nQ9IkZsb3dfMGlscjg1ZyI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjExODAiIHk9IjEzMTUiIC8+CiAgICAgICAgPGRpOndheXBvaW5 0IHg9IjExODAiIHk9IjEzNzAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjEzMDIiIHk9IjEzNzAiIC8+CiAgICAgICAgPGJwbW5ka TpCUE1OTGFiZWw+CiAgICAgICAgICABZGM6Qm91bmRzIHg9IjExODgiIHk9IjEzNDAiIHdpZHRoPSIxNSIgaGVpZ2h0PSIxNCIgLz4KICA gICAgICA8L2JwbW5kaTpCUE1OTGFiZWw+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJBc 3NvY2lhdGlvbl8xNXJwc2swX2RpIiBicG1uRWxlbWVudD0iQXNzb2NpYXRpb25fMTVycHNrMCI+CiAgICAgICAgPGRpOndheXBvaW50IHg 9IjYwMCIgeT0iMjU1NyIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNTI4IiB5PSIyNTk1IiAvPgogICAgICA8L2JwbW5kaTpCUE10R $\label{lem:wrnzt4} WRnzT4KICAgIDwvYnBtbmRp0kJQTU5QbGFuZT4KICA8L2JwbW5kaTpCUE10RG1hZ3JhbT4KPC9icG1u0mR1ZmluaXRpb25zPgo="block" the control of the control o$

```
}
],
"detection_ids": [
   "x-oca-detection--58834c29-4ceb-42a1-a218-336103021000",
   "x-oca-detection--458c02c9-3635-42e4-8873-6785e00517e7",
   "x-oca-detection--58834c29-4ceb-42a1-a218-336103021111",
```





```
"x-oca-detection--58834c29-4ceb-42a1-a218-336103021222",
    "x-oca-detection--5899C5CC-CE20-44EE-806E-9F64EBA0B29F'
    "x-oca-detection--275bf485-736d-4aa5-b172-e34d28faa58c",
    "x-oca-detection--f27cb358-d747-47ba-a6c4-e5b8debab157",
    "x-oca-detection--40a941cc-42df-4b2e-b607-6d74168084b9"
    "x-oca-detection--66aa9c25-8b56-4121-8630-dbe457393b27"
  "extensions": {
    extension-definition--dbbce349-3550-4cdd-8a7b-af58bc12de6c": {
      "extension type": "new-sdo"
 }
},
  "type": "relationship",
  "spec_version": "2.1"
  "id": "relationship--64726807-5082-43C3-B975-1484B60B963C",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "contains",
  "source_ref": "x-oca-detection-group--58834c29-4ceb-42a1-a218-321103021999",
  "target_ref": "x-oca-detection--66aa9c25-8b56-4121-8630-dbe457393b27"
},
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--d8935337-1917-446c-9c63-ac0a36438712",
  "created": "2022-03-31T13:00:00.000Z"
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "contains",
  "source_ref": "x-oca-detection-group--58834c29-4ceb-42a1-a218-321103021999",
  "target_ref": "x-oca-detection--40a941cc-42df-4b2e-b607-6d74168084b9"
},
{
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--eb6fd1a1-00bb-44c0-bba5-6c3a335c6cb6",
  "created": "2022-03-31T13:00:00.000Z"
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "contains",
  "source ref": "x-oca-detection-group--58834c29-4ceb-42a1-a218-321103021999",
  "target_ref": "x-oca-detection--275bf485-736d-4aa5-b172-e34d28faa58c"
},
{
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--64726807-5082-43C3-B975-1484B60B963D",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "contains",
  "source_ref": "x-oca-detection-group--58834c29-4ceb-42a1-a218-321103021999",
  "target_ref": "x-oca-detection--f27cb358-d747-47ba-a6c4-e5b8debab157"
},
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--64726807-5082-43C3-B975-1484B60B963B",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "contains",
  "source ref": "x-oca-detection-group--58834c29-4ceb-42a1-a218-321103021999",
  "target_ref": "x-oca-detection--5899C5CC-CE20-44EE-806E-9F64EBA0B29F"
},
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--731021e2-e7a8-4863-ba41-65c893d7c564",
  "created": "2022-03-31T13:00:00.000Z",
```





```
"modified": "2022-03-31T13:00:00.000Z",
           "relationship_type": "contains",
           "source_ref": "x-oca-detection-group--58834c29-4ceb-42a1-a218-321103021999",
           "target ref": "x-oca-detection--58834c29-4ceb-42a1-a218-336103021000"
           "type": "relationship",
           "spec version": "2.1",
           "id": "relationship--3437bf91-0115-4c05-bfda-d9abf9954f8e",
           "created": "2022-03-31T13:00:00.000Z", "modified": "2022-03-31T13:00:00.000Z",
           "relationship_type": "contains",
           "source_ref": "x-oca-detection-group--58834c29-4ceb-42a1-a218-321103021999",
            "target_ref": "x-oca-detection--458c02c9-3635-42e4-8873-6785e00517e7"
       },
           "type": "relationship",
           "spec_version": "2.1",
           "id": "relationship--e60900fc-e47e-44f3-aac2-4a5ca9be7c78",
           "created": "2022-03-31T13:00:00.000Z"
           "modified": "2022-03-31T13:00:00.000Z",
           "relationship_type": "contains",
           "source_ref": "x-oca-detection-group--58834c29-4ceb-42a1-a218-321103021999",
           "target_ref": "x-oca-detection--58834c29-4ceb-42a1-a218-336103021111"
           "type": "relationship",
           "spec_version": "2.1",
           "id": "relationship--535d743b-0b78-4891-a515-8ec92e65d42b",
           "created": "2022-03-31T13:00:00.000Z",
           "modified": "2022-03-31T13:00:00.000Z",
           "relationship_type": "contains",
           "source_ref": "x-oca-detection-group--58834c29-4ceb-42a1-a218-321103021999",
           "target_ref": "x-oca-detection--58834c29-4ceb-42a1-a218-336103021222"
       },
           "type": "extension-definition",
           "spec_version": "2.1",
           "id": "extension-definition--3b7505ce-2a18-496e-aa58-311dac6c1473",
           "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894", "created": "2022-03-31T13:00:00.000Z",
           "modified": "2022-03-31T13:00:00.000Z"
           "name": "x-oca-network-traffic Extension Definition",
           "description": "This schema extends the Network Traffic SCO with beacon scoring information from
Real Intelligence Threat Analytics (RITA).",
           "schema": "https://raw.githubusercontent.com/opencybersecurityalliance/oca-
iob/main/apl\_reference\_implementation\_bundle/revision\_2/schemas/observables/extended-network-like for the property of the pr
traffic.json",
           "version": "1.0.0",
           "extension_types": [
               "property-extension"
          ]
       },
           "type": "extension-definition",
           "spec_version": "2.1",
           "id": "extension-definition--dbbce349-3550-4cdd-8a7b-af58bc12de6c",
           "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894", "created": "2022-03-31T13:00:00.000Z",
           "modified": "2022-03-31T13:00:00.000Z"
           "name": "x-oca-detection-group Extension Definition",
           "description": "This schema creates a new object type called detection-group.",
           "schema": "https://raw.githubusercontent.com/opencybersecurityalliance/oca-
iob/main/apl_reference_implementation_bundle/revision_2/schemas/sdos/detection-group.json",
           "version": "1.0.0",
           "extension_types": [
               "new-sdo"
           ]
```





```
"type": "extension-definition",
      "spec_version": "2.1",
      "id": "extension-definition--2cf8c8c2-69f5-40f7-aa34-efcef2b912b1",
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "name": "x-oca-windows-registry-key Extension Definition",
      "description": "This schema extends the Windows Registry Key SCO.",
      "schema": "https://raw.githubusercontent.com/opencybersecurityalliance/oca-
iob/main/apl_reference_implementation_bundle/revision_2/schemas/observables/extended-windows-registry-
key.json",
      "version": "1.0.0",
      "extension_types": [
        "property-extension"
      1
    },
      "type": "x-oca-playbook",
      "spec_version": "2.1",
      "id": "x-oca-playbook--AE16A784-BAC9-4334-A09F-7CB63053A6D7",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.0002"
      "name": "Mitigate Incident",
      "description": "High level mitigation workflow prompting the analyst to block an IP, share event
data, and remediate the affected system."
       'playbook_id": "playbook--7b444e9d-9e22-469c-95de-347bf8a5ba4d",
      "playbook_format": "CACAO",
      "playbook_type": [
        "remediation"
      "playbook_bin":
```

ewogICJ0eXBlIjogInBsYXlib29rIiwKICAic3BlY192ZXJzaW9uIjogIjEuMCIsCiAgImlkIjogInBsYXlib29rLS03Yj00NGU5ZC05" TIyLTQ2OWMtOTVkZS0zNDdiZjhhNWJhNGQiLAogICJuYW1lIjogIlByb2Nlc3NfMHJ3aWlmeTogTWl0aWdhdGUiLAogICJkZXNjcmlwdGl vbi16ICIiLAogICJwbGF5Ym9va190eXBlcyI6IFsgIm1pdGlnYXRpb24iLCAicmVtZWRpYXRpb24iIF0sCiAgImNyZWF0ZWRfYnki0iAia WRlbnRpdHktLWIwODVhNjhhLWJmNDgtNDMxNi05NjY3LTM3YWY3OGNiYTg5NCIsCiAgImNyZWF0ZWQi0iAiMjAyMi0wMy0zMVQxMzowMDo wMC4wMDBaIiwKICAibW9kaWZpZWQiOiAiMjAyMi0wMy0zMVQxMzowMDowMC4wMDBaIiwKICAid29ya2Zsb3dfc3RhcnQiOiAic3RhcnQtL WM0NzA3NWF1LWI3MzctNDQ1Yy05NjZhLWViYWIxNzdjMjM2OSIsCiAgIndvcmtmbG93IjogewogICAgInN0YXJ0LS1jNDcwNzVhZS1iNzM 3LTQ0NWMtOTY2YS11YmFiMTc3YzIzNjkiOiB7CiAgICAgICJ0eXBlIjogInN0YXJ0IiwKICAgICAgIm5hbWUiOiAiU3RhcnRFdmVudF8x0 iBTdGFydCIsCiAgICAgICJvbl9jb21wbGV0aW9uIjogInNpbmdsZS0tMmI2OTdjYzItMGVjOC00NTM5LWIyOWYtNzRmNmQ3YzQ2ZDFiIgo gICAgfSwKICAgICJlbmQtLWQxY2IyZGE2LTA1NzYtNGQ@Mi1hYzU1LWRiZDRmNTE1M2EzNCI6IHsKICAgICAgInR5cGUi0iAiZW5kIiwKI CAgICAgIm5hbWUiOiAiRXZlbnRfMHU0Y3BtODogRW5kIgogICAgfSwKICAgICJzaW5nbGUtLTJiNjk3Y2MyLTBlYzgtNDUzOS1iMjlmLTc 0ZjZkN2M0NmQxYiI6IHsKICAgICAgInR5cGUi0iAic2luZ2xlIiwKICAgICAgIm5hbWUi0iAiQWN0aXZpdHlfMGk2cXh2NDogQ3JlYXRlI HRpY2tldCIsCiAgICAgICJjb21tYW5kcyI6IFt7CiAgICAgICAgInR5cGUiOiAiaHR0cC1hcGkiCiAgICAgIH1dLAogICAgICAib25fY29 tcGxldGlvbi16ICJwYXJhbGxlbC0tZWUxM2JiMWYtM2Y5Ni00MTY1LWE5MWUtZjJhMTk2MzI1ZjcwIgogICAgfSwKICAgICJzaW5nbGUtL WFkYWNlZjNlLWYzMGQtNGVhMy04MjMzLTg3YzA0N2ZmMWViZSI6IHsKICAgICAgInR5cGUiOiAic2luZ2xlIiwKICAgICAgIm5hbWUiOiA iQWN0aXZpdHlfMXhyc3EzcDogUHJvbXB0IGFuYWx5c3QgaWYgYmxvY2tpbmcgaXMgbmVlZGVkIiwKICAgICAgImNvbW1hbmRzIjogW3sKI CAgICAgICAidHlwZSI6ICJtYW51YWwiCiAgICAgIH1dLAogICAgICAib25fY29tcGxldGlvbi16ICJpZi1jb25kaXRpb24tLWRhYZRjOGF kLTk4NmUtNDU0Zi04MmU2LTd1MDcwZTUxZmJkZiIKICAgIH0sCiAgICAic2luZ2xlLS1hYzQ3MmZ1MC1hMmYxLTQ2MzMtYjc1My1iMTYwM jQ2NzM2MmQiOiB7CiAgICAgICJ0eXBlIjogInNpbmdsZSIsCiAgICAgICJuYW11IjogIkFjdGl2aXR5XzF0OHg1ZDU6IEJsb2NrIElQIG1 uIEZpcmV3YWxsIiwKICAgICAgImNvbW1hbmRzIjogW3sKICAgICAgICAidHlwZSI6ICJodHRwLWFwaSIKICAgICAgfV0sCiAgICAgICJvb 19jb21wbGV0aW9uIjogInNpbmdsZS0tNWRhNzQyNTItZTA0ZC00NTMyLWE0NGMtOWFmNDAzOTE1NzY4IgogICAgfSwKICAgICJzaW5nbGU tLTMzMGVkNzVlLTY1MGItNDI1ZS04YzhlLTAwOTM2ZWY4MTY5YyI6IHsKICAgICAgInR5cGUiOiAic2luZ2xlIiwKICAgICAgIm5hbWUiO iAiQWN0aXZpdHlfMGowc2N3NDogUHJvbXB0IGFuYWx5c3QgaWYgZXZlbnQgY2FuIGJlIHNoYXJlZCIsCiAgICAgICJjb21tYW5kcyI6IFt 7CiAgICAgICAgInR5cGUiOiAibWFudWFsIgogICAgICB9XSwKICAgICAgIm9uX2NvbXBsZXRpb24iOiAiaWYtY29uZGl0aW9uLS0yMmU5Z TQ2My1iNzE0LTRkZmYtODNmYi1iMzE5OTQ3ZDg3MzEiCiAgICB9LAogICAgInNpbmdsZS0tMTZ1YWI4NjUtMWI3ZC00Mzg2LWFkYTUtMmI 50TVhNjc4MDMzIjogewogICAgICAidHlwZSI6ICJzaW5nbGUiLAogICAgICAibmFtZSI6ICJBY3Rpdml0eV8wNXhzOGgyOiBQcm9tcHQgY W5hbHlzdCBpZiByZW1lZGlhdGlvbiBpcyBuZWVkZWQiLAogICAgICAiY29tbWFuZHMiOiBbewogICAgICJ0eXBlIjogIm1hbnVhbCI DY5ZWNlIgogICAgfSwKICAgICJzaW5nbGUtLTUxMDIwYzM0LWF1ZWEtNGE1Yy1iYWIxLTRjMWNiYjQ1ZjhmMi16IHsKICAgICAgInR5cGU iOiAic2luZ2xlIiwKICAgICAgIm5hbWUiOiAiQWN0aXZpdHlfMWdpNmNpZDogUHJvbXB0IGFuYWx5c3QgaWYgYWRkaXRpb25hbCB0YXNrc yBuZWVkIHRvIGJlIHBlcmZvcm1lZCIsCiAgICAgICJjb21tYW5kcyI6IFt7CiAgICAgICAgICAgICAGIOiAibWFudWFsIgogICAgICB9XSw KICAgICAgIm9uX2NvbXBsZXRpb24i0iAiaWYtY29uZGl0aW9uLS1mZjg3MjQ3ZC03NjViLTQyM2EtYmFhNS01MGM0NDZkYWNkMjgiCiAgI CB9LAogICAgInNpbmdsZS0tYzBmYWEyNGUtYjJhMi00MWZiLWFhMTktYjU5YWU1YTI1ZTU4IjogewogICAgICAidHlwZSI6ICJzaW5nbGU iLAogICAgICAibmFtZSI6ICJBY3Rpdml0eV8xYXJnNWY2OiBDbG9zZSB0aWNrZXQiLAogICAgICAiY29tbWFuZHMiOiBbewogICAgICAgI CJ0eXBlIjogImh0dHAtYXBpIgogICAgICB9XSwKICAgICAgIm9uX2NvbXBsZXRpb24i0iAiZW5kLS1kMwNiMmRhNi0wNTc2LTRkNDItYWM 1NS1kYmQ0ZjUxNTNhMzQiCiAgICB9LAogICAgInNpbmdsZS0tMWJmNjgzYTUtNWNkYS00ZWUxLThkMWYtY2VmNjFkNDY2NWUwIjogewogI





CAgICAidHlwZSI6ICJzaW5nbGUiLAogICAgICAibmFtZSI6ICJBY3Rpdml0eV8weDFhbTU4OiBNYXJrIGV2ZW50IGZvciBzaGFyaW5nIHN 1Ym1pc3Npb24iLAogICAgICAiY29tbWFuZHMiOiBbewogICAgICAgICJ0eXBlIjogImh0dHAtYXBpIgogICAgICB9XSwKICAgICAgIm9uX 2NvbXBsZXRpb24iOiAic2luZ2xlLS01ZGE3NDI1Mi11MDRkLTQ1MzItYTQ0Yy05YWY0MDM5MTU3NjgiCiAgICB9LAogICAgInNpbmdsZS0 tZDMxZjJjMDktODEyNi00MjkwLTk2OTktYzlmOTI5ZWE1NGY1IjogewogICAgICAidHlwZSI6ICJzaW5nbGUiLAogICAgICAibmFtZSI6I CJBY3Rpdml0eV8xcW5wd2400iBTT0MgYW5hbHlzdCBwZXJmb3JtcyBhZGRpdGlvbmFsIHRhc2tzIiwKICAgICAgImNvbW1hbmRzIjogW3s KICAgICAgICAidHlwZSI6ICJtYW51YWwiCiAgICAgIH1dLAogICAgICAib25fY29tcGxldGlvbiI6ICJzaW5nbGUtLTVkYTc0MjUyLWUwN GQtNDUzMi1hNDRjLTlhZjQwMzkxNTc2OCIKICAgIH0sCiAgICAic2luZ2xlLS01ZGE3NDI1Mi11MDRkLTQ1MzItYTQ0Yy05YWY0MDM5MTU 3NjgiOiB7CiAgICAgICJ0eXB1IjogInNpbmdsZSIsCiAgICAgICJuYW11IjogIkV2ZW50XzBqMzlteG06IEFsbCBnYXRld2F5cyBmaW5pc 2gilAogICAgICAiY29tbWFuZHMiOiBbewogICAgICJ0eXBlIjogIm1hbnVhbCIKICAgICAgfV0sCiAgICAgICJvbl9jb21wbGV0aW9 uIjogInNpbmdsZS0tYzBmYWEyNGUtYjJhMi00MWZiLWFhMTktYjU5YWU1YTI1ZTU4IgogICAgfSwKICAgICJwYXJhbGxlbC0tZWUxM2JiM WYtM2Y5Ni00MTY1LWE5MWUtZjJhMTk2MzI1ZjcwIjogewogICAgICAidHlwZSI6ICJwYXJhbGxlbCIsCiAgICAgICJuYW11IjogIkFjdGl 2aXR5XzE0cnVpMjA6IFNlbmQgZW1haWwgdG8gU09DIGFuYWx5c3Qgd2l0aCB0aWNrZXQgVVJMIiwKICAgICAgIm5leHRfc3RIcHMi0iBbC iAgICAgICAgInNpbmdsZS0tYWRhY2VmM2UtZjMwZC00ZWEzLTgyMzMtODdjMDQ3ZmYxZWJlIiwKICAgICAjCAic2luZ2xlLS0xNmVhYjg 2NS0xYjdkLTQzODYtYWRhNS0yYjk5NWE2NzgwMzMiLAogICAgICAgICJzaW5nbGUtLTUxMDIwYzM0LWF1ZWEtNGE1Yy1iYWIxLTRjMWNiY jQ1ZjhmMiIsCiAgICAgICAgInNpbmdsZS0tMzMwZWQ3NWUtNjUwYi00MjVlLThj0GUtMDA5MzZlZjgxNjljIgogICAgICBdCiAgICB9LAo gICAgInBsYXlib29rLS1kNTdhNTMyYi11MzUzLTRjYTQtOWMyOC04NWYwN2M3ZWNjODkiOiB7CiAgICAgICJ0eXBlIjogInBsYXlib29rI iwKICAgICAgIm5hbWUiOiAiQWN0aXZpdHlfMWxmMHB3NTogUmVtZWRpYXRlIHN5c3RlbSIsCiAgICAgICJwbGF5Ym9va19pZCI6ICJwbGF 5Ym9vay0tNzY3ZDg10WUtNzM4Ny00ZTBjLTk1YzAtNDU4Y2EzNjk00DZmIiwKICAgICAgIm9uX2NvbXBsZXRpb24i0iAic2luZ2xlLS01Z GE3NDI1Mi11MDRkLTQ1MzItYTQ0Yy05YWY0MDM5MTU3NjgiCiAgICB9LAogICAgImlmLWNvbmRpdGlvbi0tZGFjNGM4YWQtOTg2ZS00NTR zZhdGc6IEJsb2NraW5nIG51ZWR1ZD8iLAogICAgiCAib25fdHJ1ZSI6IFsKICAgICAgiCAic2luZ2xlLS1hYzQ3MmZlMC1hMmYxLTQ2MzM tYjc1My1iMTYwMjQ2NzM2MmQiCiAgICAgIF0sCiAgICAgICJvbl9mYWxzZSI6IFsKICAgICAgICAic2luZ2xlLS01ZGE3NDI1Mi11MDRkL TQ1MzItYTQ0Yy05YWY0MDM5MTU3NjgiCiAgICAgIF0KICAgIH0sCiAgICAiaWYtY29uZGl0aW9uLS0yMmU5ZTQ2My1iNzE0LTRkZmYtODN mYi1iMzE5OTQ3ZDg3MzEiOiB7CiAgICAgICJ0eXBlIjogImlmLWNvbmRpdGlvbiIsCiAgICAgICJuYW1lIjogIkdhdGV3YXlfMTh5d3k5a jogU2hhcmUgZXZlbnQ/IiwKICAgICAgIm9uX3RydWUiOiBbCiAgICAgICAgINNpbmdsZS0tMWJmNjgzYTUtNWNkYS00ZWUxLThkMWYtY2V mNjFkNDY2NWUwIgogICAgICBdLAogICAgICAib25fZmFsc2UiOiBbCiAgICAgICAgInNpbmdsZS@tNWRhNzQyNTItZTA@ZC@@NTMyLWE@N ${\tt GMtOWFmNDAzOTE1NzY41gogICAgICBdCiAgICB9LAogICAgImlmLWNvbmRpdGlvbi0tZmY4NzI0N2QtNzY1Yi00MjNhLWJhYTUtNTBjNDQ} \\$ 2ZGFjZDI4IjogewogICAgICAidHlwZSI6ICJpZi1jb25kaXRpb24iLAogICAgICAibmFtZSI6ICJHYXRld2F5XzBlNTVwMnk6IEFkZGl0a 5LWM5ZjkyOWVhNTRmNSIKICAgICAgXSwKICAgICAgIm9uX2ZhbHNlljogWwogICAgICJzaW5nbGUtLTVkYTc0MjUyLWUwNGQtNDUzM i1hNDRjLTlhZjQwMzkxNTc2OCIKICAgICAgXQogICAgfSwKICAgICJpZi1jb25kaXRpb24tLWFkZjdiMjg4LWI0YzQtNDMyMi04MjkyLTc 5MmE5MmQ20WVjZS16IHsK1CAgICAgInR5cGUiOiAiaWYtY29uZGl0aW9uIiwKICAgICAgIm5hbWUiOiAiR2F0ZXdheV8xNzQxcGUwOiBSZ W11ZGlhdGlvbiBuZWVkZWQ/IiwKICAgICAgIm9uX3RydWUiOiBbCiAgICAgICAgInBsYXlib29rLS1kNTdhNTMyYi1lMzUzLTRjYTQtOWM yOCO4NWYwN2M3ZWNjODkiCiAgICAgIF0sCiAgICAgICJvbl9mYWxzZSI6IFsKICAgICAgICAic2luZ2xlLS01ZGE3NDI1Mi11MDRkLTQ1M zItYTQ0Yy05YWY0MDM5MTU3NjgiCiAgICAgIF0KICAgIH0KICB9Cn0K",

```
"playbook_abstraction": "template",
"playbook_creation_time": "2022-03-31T13:00:00.000Z",
       "playbook_modification_time": "2022-03-31T13:00:00.000Z",
       "revoked": false,
       "playbook_creator": "identity--b085a68a-bf48-4316-9667-37af78cba894",
        'extensions": {
          extension-definition--809C4D84-7A6E-4039-97B4-DA9FEA03FCF9": {
            "extension_type": "new-sdo"
      }
    },
       "type": "x-oca-playbook",
       "spec_version": "2.1",
       "id": "x-oca-playbook--720E5E68-3959-4EE0-99DE-87A4EAA39F44",
       "created": "2022-03-31T13:00:00.000Z",
       "modified": "2022-03-31T13:00:00.000Z",
       "name": "Mitigate Incident",
       "playbook_id": "B9640789-F2A2-4C17-8615-3B30BB52D4F3",
"description": "High level mitigation workflow prompting the analyst to block an IP,share event
data, and remediate the affected system.",
       "playbook_format": "BPMN",
       "playbook_type": [
         "remediation"
       "playbook bin":
```

"PD94bWwgdmVyc2lvbj0iMS4wIiBlbmNvZGluZz0iVVRGLTgiPz4KPGJwbW46ZGVmaW5pdGlvbnMgeG1sbnM6YnBtbj0iaHR0cDovL3d3d y5vbWcub3JnL3NwZWMvQlBNTi8yMDEwMDUyNC9NT0RFTCIgeG1sbnM6YnBtbmRpPSJodHRw0i8vd3d3Lm9tZy5vcmcvc3BlYy9CUE10LzI wMTAwNTI0L0RJIiB4bWxuczpkYz0iaHR0cDovL3d3dy5vbWcub3JnL3NwZWMvREQvMjAxMDA1MjQvREMiIHhtbG5zOnplZWJlPSJodHRw0i8vY2FtdW5kYS5vcmcvc2NoZW1hL3plZWJlLzEuMCIgeG1sbnM6ZGk9Imh0dHA6Ly93d3cub21nLm9yZy9zcGVjL0RELzIwMTAwNTI0L0RJIiB4bWxuczptb2RlbGVyPSJodHRw0i8vY2FtdW5kYS5vcmcvc2NoZW1hL21vZGVsZXIvMS4wIiBpZD0iRGVmaW5pdGlvbnNfMTc0ZG4wNSIgdGFyZ2V0TmFtZXNwYWNlPSJodHRw0i8vYnBtbi5pby9zY2hlbWEvYnBtbiIgZXhwb3J0ZXI9IkNhbXVuZGEgTW9kZWxlciIgZXhwb3J0ZXJJzaW9uPSI1LjUuMSIgbW9kZWxlcjpleGVjdXRpb25QbGF0Zm9ybT0iQ2FtdW5kYSBDbG91ZCIgbW9kZWxlcjpleGVjdXRpb25Qb





GF0Zm9ybVZlcnNpb249IjguMS4wIj4KICA8YnBtbjpwcm9jZXNzIGlkPSJ0cm9jZXNzXzByd2lpZnkiIGlzRXhlY3V0YWJsZT0idHJ1ZSI +CiAgICA8YnBtbjpzdGFydEV2ZW50IGlkPSJTdGFydEV2ZW50XzEiPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzBkNWlqeTQ8L2Jwb W46b3V0Z29pbmc+CiAgICA8L2JwbW46c3RhcnRFdmVudD4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18wZDVpank0IiBzb3V yY2VSZWY9IlN0YXJ0RXZlbnRfMSIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8waTZxeHY0IiAvPgogICAgPGJwbW46c2VydmljZVRhc2sgaWQ9I . kFjdGl2aXR5XzBpNnF4djQiIG5hbWU9IkNyZWF0ZSB0aWNrZXQiPgogICAgICA8YnBtbjpleHRlbnNpb25FbGVtZW50cz4KICAgICAgICA 8emVlYmU6dGFza0R1ZmluaXRpb24gdHlwZT0idGlja2V0aW5nIiAvPgogICAgICA8L2JwbW46ZXh0ZW5zaW9uRWxlbWVudHM+CiAgICAgI DxicG1uOmluY29taW5nPkZsb3dfMGQ1aWp5NDwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18wY20xN3FpPC9 icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnNlcnZpY2VUYXNrPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzBjbTE3cWkiI $\label{lem:hvdXJjZVJ1Zj0iQWN0aXZpdH1fMGk2cXh2NCIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8xNHJ1aTIwIiAvPgogICAgPGJwbW46c2VuZFRhc2s \\$ gaWQ9IkFjdGl2aXR5XzE0cnVpMjAiIG5hbWU9IlNlbmQgZW1haWwgdG8gU09DIGFuYWx5c3Qgd2l0aCB0aWNrZXQgVVJMIj4KICAgICAgP GJwbW46ZXh0ZW5zaW9uRWxlbWVudHM+CiAgICAgICAgPHplZWJlOnRhc2tEZWZpbml0aW9uIHR5cGU9ImVtYWlsIiAvPgogICAgICA8L2J wbW46ZXh0ZW5zaW9uRWxlbWVudHM+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMGNtMTdxaTwvYnBtbjppbmNvbWluZz4KICAgICAgP GJwbW46b3V0Z29pbmc+Rmxvd18xdWJhemo1PC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnNlbmRUYXNrPgogICAgPGJwbW46c2Vydml jZVRhc2sgaWQ9IkFjdGl2aXR5XzF4cnNxM3AiIG5hbWU9IlByb21wdCBhbmFseXN0IGlmIGJsb2NraW5nIGlzIG5lZWRlZCI+CiAgICAgI DxicG1u0mV4dGVuc2lvbkVsZW1lbnRzPgogICAgICAgIDx6ZWViZTp0YXNrRGVmaW5pdGlvbiB0eXBlPSJzb2FyIiAvPgogICAgICA8L2J wbW46ZXh0ZW5zaW9uRWxlbWVudHM+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMHlyZWE2YzwvYnBtbjppbmNvbWluZz4KICAgICAgP $\label{eq:GJwbW46b3V0Z29pbmc+Rmxvd18wcWhqc2RvPC9icG1u0m91dGdvaW5nPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPGJwbW46ZXhpgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPGJwbW46ZXhpgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPGJwbW46ZXhpgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPGJwbW46ZXhpgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPGJwbW46ZXhpgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPCJwbW46ZXhpgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPCJwbW46ZXhpgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPCJwbW46ZXhpgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPCJwbW46ZXhpgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPCJwbW46ZXhpgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPCJwbW46ZXhpgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPCJwbW46ZXhpgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPCJwbW46ZXhpgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPCJwbW46ZXhpgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPCJwbW46ZXhpgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgPC9icG1u0nN1cnZpY2VUYXNrPgogICAgpC9icG1u0nN1cnZpY2VUYXNrPgogICAgpC9icG1u0nN1cnZpY2VUYXNrPgogICAgpC9icG1u0nN1cnZpY2VUYXNrPgogICAgpC9icG1u0nN1cnZpY2VUYXNrPgogICAgpC9icG1u0nN1cnZpY2VUYXNrPgogICAgpC9icG1u0nN1cnZpY2VUYXNrPgogICAgpC9icG1u0nN1cnZpY2VUYXNrPgogICAgpC9icG1u0nN1cnZpY2VUYXNrPgogICAgpC9icG1u0nN1cnZpY2VUYXNrPgogICAgpC9icG1u0nN1cnZpY2VUYXNrPgogICAgpC9icG1u0nN1cnZpY2VUYXNrPgogICAgpC9ic$ jbHVzaXZlR2F0ZXdheSBpZD0iR2F0ZXdheV8xcTM2YXRnIiBuYW1lPSJCbG9ja2luZyBuZWVkZWQ/Ij4KICAgICAgPGJwbW46aW5jb21pb mc+Rmxvd18wcWhqc2RvPC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzAwM2s5cmQ8L2JwbW46b3V0Z29pbmc +CiAgICAgIDxicG1u0m91dGdvaW5nPkZsb3dfMXRqc3I4ZzwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjpleGNsdXNpdmVHYXRld2F5P gogICAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzBxaGpzZG8iIHNvdXJjZVJlZj0iQWN0aXZpdHlfMXhyc3EzcCIgdGFyZ2V0UmV mPSJHYXRld2F5XzFxMzZhdGciIC8+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMDAzazlyZCIgbmFtZT0iWWVzIiBzb3VyY 2VSZWY9IkdhdGV3YX1fMXEzNmF0ZyIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8xdDh4NWQ1IiAvPgogICAgPGJwbW46c2VydmljZVRhc2sgaWQ 9IkFjdGl2aXR5XzF0OHg1ZDUiIG5hbWU9IkJsb2NrIElQIGluIEZpcmV3YWxsIj4KICAgICAgPGJwbW46ZXh0ZW5zaW9uRWxlbWVudHM+C iAgICAgICAgPHplZWJlOnRhc2tEZWZpbml0aW9uIHR5cGU9ImZpcmV3YWxsIiAvPgogICAgICA8L2JwbW46ZXh0ZW5zaW9uRWxlbWVudHM +CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMDAzazlyZDwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18wM nR4ZWsxPC9icG1u0m91dGdvaW5nPgogICAgPC9icG1u0nNlcnZpY2VUYXNrPgogICAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzB 5cmVhNmMiIHNvdXJjZVJlZj0iR2F0ZXdheV8xZGJyaDBoIiB0YXJnZXRSZWY9IkFjdGl2aXR5XzF4cnNxM3AiIC8+CiAgICA8YnBtbjpzZ gICAgIDxicG1u0mV4dGVuc2lvbkVsZW1lbnRzPgogICAgICAgIDx6ZWViZTp0YXNrRGVmaW5pdGlvbiB0eXBlPSJzb2FyIiAvPgogICAgI CA8L2JwbW46ZXh0ZW5zaW9uRWxlbWVudHM+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMGhlNGtkeDwvYnBtbjppbmNvbWluZz4KICA gICAgPGJwbW46b3V0Z29pbmc+Rmxvd18wbDVpYm82PC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnNlcnZpY2VUYXNrPgogICAgPGJwb W46ZXhjbHVzaXZlR2F0ZXdheSBpZD0iR2F0ZXdheV8xOHl3eTlqIiBuYW1lPSJTaGFyZSBldmVudD8iPgogICAgICA8YnBtbjppbmNvbWl uZz5GbG93XzBsNWlibzY8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMHZrNmo2MjwvYnBtbjpvdXRnb21uZb2b3dfMHZrNmo2MjwvYnBtbjpvdXrnmo2MjwwyYnBtbjpwdXrnmo2MjwwyYnBtbjpwdXrnmo2MjwwyYnBtbjpwdXrnmo2MjwwyYnBtbjpwdXrmwyYnDyMywyYnDyWyNDyWyNDyWyNAyWyNDyWyNYNByWyz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18wMGVtemM0PC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOmV4Y2x1c212ZUdhdGV3YXk +CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMGw1aWJvNiIgc291cmNlUmVmPSJBY3Rpdml0eV8wajBzY3c0IiB0YXJnZXRSZ WY9IkdhdGV3YXlfMTh5d3k5aiIgLz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18wdms2ajYyIiBuYW1lPSJZZXMiIHNvdXJ jZVJlZj0iR2F0ZXdheV8xOHl3eTlqIiB0YXJnZXRSZWY9IkFjdGl2aXR5XzB4MWFtNTgiIC8+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cga WQ9IkZsb3dfMWkxYzJndyIgc291cmN1UmVmPSJHYXRld2F5XzFkYnJoMGgiIHRhcmdldFJlZj0iQWN0aXZpdHlfMDV4czhoMiIgLz4KICA gIDxicG1uOnNlcnZpY2VUYXNrIGlkPSJBY3Rpdml0eV8wNXhzOGgyIiBuYW1lPSJQcm9tcHQgYW5hbHlzdCBpZiByZW1lZGlhdGlvbiBpc yBuZWVkZWQiPgogICAgICA8YnBtbjpleHRlbnNpb25FbGVtZW50cz4KICAgICAgICA8emVlYmU6dGFza0RlZmluaXRpb24gdHlwZT0ic29 hciIgLz4KICAgICAgPC9icG1uOmV4dGVuc2lvbkVsZW11bnRzPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzFpMWMyZ3c8L2JwbW46a W5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMThmejYydDwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjpzZXJ2aWNlVGF zaz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18xZTJvbnVrIiBzb3VyY2VSZWY9IkdhdGV3YXlfMWRicmgwaCIgdGFyZ2V0U mVmPSJBY3Rpdml0eV8xZ2k2Y2lkIiAvPgogICAgPGJwbW46c2VydmljZVRhc2sgaWQ9IkFjdGl2aXR5XzFnaTZjaWQiIG5hbWU9IlByb21 wdCBhbmFseXN0IGlmIGFkZG10aW9uYWwgdGFza3MgbmVlZCB0byBiZSBwZXJmb3JtZWQiPgogICAgICA8YnBtbjpleHRlbnNpb25FbGVtZ $\label{locality} W50cz4KICAgICAgICAgemV1YmU6dGFza0R1ZmluaXRpb24gdHlwZT0ic29hciIgLz4KICAgICAgPC9icG1u0mV4dGVuc21vbkVsZW11bnR$ zPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzFlMm9udWs8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfM Xd4ams@ejwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjpzZXJ2aWNlVGFzaz4KICAgIDxicG1uOmV4Y2x1c2l2ZUdhdGV3YXkgaWQ9Ikd hdGV3YX1fMGU1NXAyeSIgbmFtZT0iQWRkaXRpb25hbCB0YXNrcyBuZWVkZWQ/Ij4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18xd3hqa zR6PC9icG1u0mluY29taW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzAzYzZ5YXk8L2JwbW46b3V0Z29pbmc+CiAgICAgIDxicG1 uOm91dGdvaW5nPkZsb3dfMXJxdGNwajwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjpleGNsdXNpdmVHYXRld2F5PgogICAgPGJwbW46c 2VxdWVuY2VGbG93IG1kPSJGbG93XzF3eGprNHoiIHNvdXJjZVJ1Zj0iQWN0aXZpdH1fMWdpNmNpZCIgdGFyZ2V0UmVmPSJHYXR1d2F5XzB lNTVwMnkiIC8+CiAgICA8YnBtbjp1c2VyVGFzayBpZD0iQWN0aXZpdHlfMXFucHduNCIgbmFtZT0iU09DIGFuYWx5c3QgcGVyZm9ybXMgY WRkaXRpb25hbCB0YXNrcyI+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMDNjNnlheTwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW4 6b3V0Z29pbmc+Rmxvd18wa3VwdXozPC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnVzZXJUYXNrPgogICAgPGJwbW46ZXhjbHVzaXZlR 2F0ZXdheSBpZD0iR2F0ZXdheV8xNzQxcGUwIiBuYW11PSJSZW11ZGlhdGlvbiBuZWVkZWQ/Ij4KICAgICAgPGJwbW46aW5jb21pbmc+Rmx vd18xOGZ6NjJ0PC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzExZXdlbjY8L2JwbW46aW5jb21pbmc+CiAgI CAgIDxicG1uOm91dGdvaW5nPkZsb3dfMXhndWE1OTwvYnBtbjpvdXRnb2luZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18wdmN0bXh kPC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOmV4Y2x1c2l2ZUdhdGV3YXk+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfM ThmejYydCIgc291cmNlUmVmPSJBY3Rpdml0eV8wNXhzOGgyIiB0YXJnZXRSZWY9IkdhdGV3YXlfMTc0MXBlMCIgLz4KICAgIDxicG1uOnN lcXVlbmNlRmxvdyBpZD0iRmxvd18xdWJhemo1IiBzb3VyY2VSZWY9IkFjdGl2aXR5XzE0cnVpMjAiIHRhcmdldFJlZj0iR2F0ZXdheV8xZ GJyaDBoIiAvPgogICAgPGJwbW46cGFyYWxsZWxHYXRld2F5IGlkPSJHYXRld2F5XzFkYnJoMGgiPgogICAgICA8YnBtbjppbmNvbWluZz5 GbG93XzF1YmF6ajU8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMHlyZWE2YzwvYnBtbjpvdXRnb2luZz4KI CAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xZTJvbnVrPC9icG1uOm91dGdvaW5nPgogICAgICA8YnBtbjpvdXRnb2luZz5GbG93XzFpMWM jpwYXJhbGxlbEdhdGV3YXk+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMXhndWE10SIgbmFtZT0iWWVzIiBzb3VyY2VSZWY 9IkdhdGV3YX1fMTc0MXB1MCIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8xbGYwcHc1IiAvPgogICAgPGJwbW46Y2FsbEFjdG12aXR5IG1kPSJBY





3Rpdml0eV8xbGYwcHc1IiBuYW11PSJSZW11ZGlhdGUgc3lzdGVtIj4KICAgICAgPGJwbW46ZXh0ZW5zaW9uRWxlbWVudHM+CiAgICAgICA gPHp1ZWJ1OmNhbGx1ZEVsZW11bnQgcHJvY2Vzc0lkPSJQcm9jZXNzXzE4MTFmOHciIHByb3BhZ2F0ZUFsbENoaWxkVmFyaWFibGVzPSJmY WxzZSIgLz4KICAgICAgPC9icG1uOmV4dGVuc2lvbkVsZW1lbnRzPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzF4Z3VhNTk8L2JwbW4 6aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMTFld2VuNjwvYnBtbjpvdXRnb2luZz4KICAgICAgPGJwbW46b3V0Z29pb $\verb|mc+Rmxvd18xbm9mcXBmPC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOmNhbGxBY3Rpdml0eT4KICAgIDxicG1uOnNlcnZpY2VUYXNrIG1| \\$ kPSJBY3Rpdml0eV8xYXJnNWY2IiBuYW11PSJDbG9zZSB0aWNrZXQiPgogICAgICA8YnBtbjpleHRlbnNpb25FbGVtZW50cz4KICAgICAgI ${\tt CA8emVlymU6dGFza0RlZmluaXRpb24gdHlwZT0idGlja2V0aW5nIiAvPgogICAgICA8L2JwbW46ZXh0ZW5zaW9uRWxlbWVudHM+CiAgICAB} \\$ gIDxicG1uOmluY29taW5nPkZsb3dfMHFicDJ5NDwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xN3NyNDZzP C9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnNlcnZpY2VUYXNrPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzBrdXB1ejM iIHNvdXJjZVJlZj0iQWN0aXZpdHlfMXFucHduNCIgdGFyZ2V0UmVmPSJFdmVudF8wajM5bXhtIiAvPgogICAgPGJwbW46ZW5kRXZlbnQga WQ9IkV2ZW50XzB1NGNwbTgiPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzE3c3I0NnM8L2JwbW46aW5jb21pbmc+CiAgICA8L2JwbW4 6ZW5kRXZlbnQ+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMTdzcjQ2cyIgc291cmNlUmVmPSJBY3Rpdm10eV8xYXJnNWY2I iB0YXJnZXRSZWY9IkV2ZW50XzB1NGNwbTgiIC8+CiAgICA8YnBtbjppbnRlcm1lZGlhdGVUaHJvd0V2ZW50IGlkPSJFdmVudF8wajM5bXh tIiBuYW11PSJBbGwgZ2F0ZXdheXMgZmluaXNoIj4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18xdGpzcjhnPC9icG1uOmluY29taW5nP gogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzAwZW16YzQ8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMHY zbGlnMjwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18wMnR4ZWsxPC9icG1uOmluY29taW5nPgogICAgICA8Y nBtbjppbmNvbWluZz5GbG93XzBrdXB1ejM8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMW5vZnFwZjwvYnB tbjppbmNvbWluZz4KICAgICAgPGJwbW46aW5jb21pbmc+Rmxvd18xcnF0Y3BqPC9icG1uOmluY29taW5nPgogICAgICA8YnBtbjppbmNvb WluZz5GbG93XzB2Y3RteGQ8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMHFicDJ5NDwvYnBtbjpvdXRnb21 uZz4KICAgIDwvYnBtbjppbnRlcm11ZGlhdGVUaHJvd0V2ZW50PgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzF0anNy0GciIIG5hbWU9Ik5vIiBzb3VyY2VSZWY9IkdhdGV3YXlfMXEzNmF0ZyIgdGFyZ2V0UmVmPSJFdmVudF8wajM5bXhtIiAvPgogICAgPGJwbW46c2V xdWVuY2VGbG93IG1kPSJGbG93XzAwZW16YzQiIG5hbWU9Ik5vIiBzb3VyY2VSZWY9IkdhdGV3YX1fMTh5d3k5aiIgdGFyZ2V0UmVmPSJFd mVudF8wajM5bXhtIiAvPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzAzYzZ5YXkiIG5hbWU9IlllcyIgc291cmNlUmVmPSJ HYXRld2F5XzBlNTVwMnkiIHRhcmdldFJlZj0iQWN0aXZpdHlfMXFucHduNCIgLz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd 6c2VxdWVuY2VGbG93IG1kPSJGbG93XzB2M2xpZzIiIHNvdXJjZVJlZj0iQWN0aXZpdHlfMHgxYW010CIgdGFyZ2V0UmVmPSJFdmVudF8wa jM5bXhtIiAvPgogICAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzAydHhlazEiIHNvdXJjZVJ1Zj0iQWN0aXZpdH1fMXQ4eDVkNSI gdGFyZ2V0UmVmPSJFdmVudF8wajM5bXhtIiAvPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJGbG93XzBxYnAyeTQiIHNvdXJjZVJlZ j0iRXZlbnRfMGozOW14bSIgdGFyZ2V0UmVmPSJBY3Rpdm10eV8xYXJnNWY2IiAvPgogICAgPGJwbW46c2VydmljZVRhc2sgaWQ9IkFjdGl 2aXR5XzB4MWFtNTgiIG5hbWU9Ik1hcmsgZXZlbnQgZm9yIHNoYXJpbmcgc3VibWlzc2lvbiI+CiAgICAgIDxicG1uOmV4dGVuc2lvbkVsZ W11bnRzPgogICAgICAgIDx6ZWViZTp0YXNrRGVmaW5pdGlvbiB0eXBlPSJzaGFyaW5nIiAvPgogICAgICA8L2JwbW46ZXh0ZW5zaW9uRWx lbWVudHM+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMHZrNmo2MjwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+R mxvd18wdjNsaWcyPC9icG1u0m91dGdvaW5nPgogICAgPC9icG1u0nNlcnZpY2VUYXNrPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJ GbG93XzExZXdlbjYiIHNvdXJjZVJlZj0iQWN0aXZpdHlfMWxmMHB3NSIgdGFyZ2V0UmVmPSJHYXRld2F5XzE3NDFwZTAiIC8+CiAgICA8Y nBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMW5vZnFwZiIgc291cmNlUmVmPSJBY3Rpdml0eV8xbGYwcHc1IiB0YXJnZXRSZWY9IkV2ZW5 0XzBqMzlteG0iIC8+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMXJxdGNwaiIgbmFtZT0iTm8iIHNvdXJjZVJlZj0iR2F0Z XdheV8wZTU1cDJ5IiB0YXJnZXRSZWY9IkV2ZW50XzBqMzlteG0iIC8+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMHZjdG1 42 CIgbmFtZT0iTm8iIHNvdXJjZVJ1Zj0iR2F0ZXdheV8xNzQxcGUwIiB0YXJnZXRSZWY9IkV2ZW50XzBqMzlteG0iIC8+CiAgICA8YnBtbjp0ZXh0QW5ub3RhdGlvbiBpZD0iVGV4dEFubm90YXRpb25fMXY5MDhzNyI+CiAgICAgIDxicG1uOnRleHQ+V2FpdCB1bnRpbCBhbGwgcHJ ldmlvdXMgZ2F0ZXdheXMgYXJlIGNvbXBsZXRlLjwvYnBtbjp0ZXh0PgogICAgPC9icG1uOnRleHRBbm5vdGF0aW9uPgogICAgPGJwbW46Y XNzb2NpYXRpb24gaWQ9IkFzc29jaWF0aW9uXzFzcDhvdGYiIHNvdXJjZVJlZj0iRXZlbnRfMGozOW14bSIgdGFyZ2V0UmVmPSJUZXh0QW5 ub3RhdGlvbl8xdjkwOHM3IiAvPgogIDwvYnBtbjpwcm9jZXNzPgogIDxicG1uZGk6QlBNTkRpYWdyYW0gaWQ9IkJQTU5EaWFncmFtXzEiP gogICAgPGJwbW5kaTpCUE10UGxhbmUgaWQ9IkJQTU5QbGFuZV8xIiBicG1uRWxlbWVudD0iUHJvY2Vzc18wcndpaWZ5Ij4KICAgICAgPGJ wbW5kaTpCUE10U2hhcGUgaWQ9Il9CUE10U2hhcGVfU3RhcnRFdmVudF8yIiBicG1uRWxlbWVudD0iU3RhcnRFdmVudF8xIj4KICAgICAgI CA8ZGM6Qm91bmRzIHg9IjE1MiIgeT0iNjUyIiB3aWR0aD0iMzYiIGhlaWdodD0iMzYiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4 KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkFjdGl2aXR5XzBpemc3NmtfZGkiIGJwbW5FbGVtZW50PSJBY3Rpdml0eV8waTZxeHY0I j4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjI2MCIgeT0iNjMwIiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTp CUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJBY3Rpdml0eV8xbG0zZGx3X2RpIiBicG1uRWxlbWVudD0iQWN0aXZpd HlfMTRydWkyMCI+CiAgICAgPGRjOkJvdW5kcyB4PSI0NTQiIHk9IjYzMCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLz4KICAgICA gPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iQWN0aXZpdHlfMGF3aW9xZF9kaSIgYnBtbkVsZW1lb nQ9IkFjdGl2aXR5XzF4cnNxM3AiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iODEwIiB5PSI5ODAiIHdpZHRoPSIxMDAiIGhlaWdodD0iODA iIC8+CiAgICAgICAgPGJwbW5kaTpCUE1OTGFiZWwgLz4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRpOkJOTU5Ta GFwZSBpZD0iR2F0ZXdheV8xcTM2YXRnX2RpIiBicG1uRWxlbWVudD0iR2F0ZXdheV8xcTM2YXRnIiBpc01hcmtlc1Zpc2libGU9InRydWU iPgogICAgICAgIDxkYzpCb3VuZHMgeD0iMTA2NSIgeT0iOTk1IiB3aWR0aD0iNTAiIGhlaWdodD0iNTAiIC8+CiAgICAgICAgPGJwbW5ka TpCUE1OTGFiZWw+CiAgICAgICAgICA8ZGM6Qm91bmRzIHg9IjEwNDYiIHk9Ijk3MSIgd2lkdGg9Ijg4IiBoZWlnaHQ9IjE0IiAvPgogICA gICAgIDwvYnBtbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iQ WN0aXZpdHlfMXRvZDJzZV9kaSIgYnBtbkVsZW1lbnQ9IkFjdGl2aXR5XzF0OHg1ZDUiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iMTA0MCI geT0iMTExMCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLz4KICAgICAgPC9icG1uZGk6QlBNT1NoYXB1PgogICAgICA8YnBtbmRpOkJQT U5TaGFwZSBpZD0iQWN0aXZpdHlfMWV2aXozdV9kaSIgYnBtbkVsZW1lbnQ9IkFjdGl2aXR5XzBqMHNjdzQiPgogICAgICAgIDxkYzpCb3V $\verb|uZHMgeD0iODEwIiB5PSI3MTAiIHdpZHRoPSIxMDAiIGhlaWdodD0iODAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPAGFWZT4KICAGFWZT$ GJwbW5kaTpCUE10U2hhcGUgaWQ9IkdhdGV3YXlfMTh5d3k5al9kaSIgYnBtbkVsZW1lbnQ9IkdhdGV3YXlfMTh5d3k5aiIgaXNNYXJrZXJ WaXNpYmxlPSJ0cnVlIj4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjEwNjUiIHk9IjcyNSIgd2lkdGg9IjUwIiBoZWlnaHQ9IjUwIiAvPgogI CAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgPGRjOkJvdW5kcyB4PSIxMDU3IiB5PSI3MDEiIHdpZHRoPSI2NiIgaGVpZ2h 0PSIxNCIgLz4KICAgICAgICABL2JwbW5kaTpCUE10TGFiZWw+CiAgICAgIDwvYnBtbmRp0kJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCU E10U2hhcGUgaWQ9IkFjdGl2aXR5XzFlamkxNTBfZGkiIGJwbW5FbGVtZW50PSJBY3Rpdml0eV8wNXhzOGgyIj4KICAgICAgICA8ZGM6Qm9 1bmRzIHg9IjgxMCIgeT0iMzUwIiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgI DxicG1uZGk6Q1BNT1NoYXB1IG1kPSJBY3Rpdml0eV8xcWdoa3E4X2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMWdpNmNpZCI+CiAgICA gICAgPGRjOkJvdW5kcyB4PSI4MTAiIHk9IjEwMCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTlNoY





XBlPgogICAgICA8YnBtbmRpOkJOTU5TaGFwZSBpZD0iR2F0ZXdheV8wZTU1cDJ5X2RpIiBicG1uRWxlbWVudD0iR2F0ZXdheV8wZTU1cDJ 5IiBpc01hcmtlclZpc2libGU9InRydWUiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iMTA2NSIgeT0iMTE1IiB3aWR0aD0iNTAiIGhlaWdod oPSI3OCIgaGVpZ2h0PSIyNyIgLz4KICAgICAgICA8L2JwbW5kaTpCUE10TGFiZWw+CiAgICAgIDwvYnBtbmRp0kJQTU5TaGFwZT4KICAgI gICAgICA8ZGM6Qm91bmRzIHg9IjEwNDAiIHk9IjIzMCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLz4KICAgICAgICA8YnBtbmRpOkJQT U5MYWJlbCAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6Q1BNT1NoYXB1IG1kPSJHYXR1d2F5XzE3NDFwZTB fZGkiIGJwbW5FbGVtZW50PSJHYXRld2F5XzE3NDFwZTAiIG1zTWFya2VyVmlzaWJsZT0idHJ1ZSI+CiAgICAgICAgPGRj0kJvdW5kcyB4P SIxMDY1IiB5PSIzNjUiIHdpZHRoPSI1MCIgaGVpZ2h0PSI1MCIgLz4KICAgICAgICA8YnBtbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDx kYzpCb3VuZHMgeD0iMTA1OSIgeT0iMzI3LjUiIHdpZHRoPSI2MiIgaGVpZ2h0PSIyNyIgLz4KICAgICAgICA8L2JwbW5kaTpCUE1OTGFiZ Ww+CiAgICAgIDwvYnBtbmRp0kJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkdhdGV3YXlfMWZ1c2JidV9kaSIgYnB tbkVsZW1lbnQ9IkdhdGV3YX1fMWRicmgwaCI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSI2NDUiIHk9IjY0NSIgd2lkdGg9IjUwIiBoZWlna HQ9IjUwIiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6Q1BNT1NoYXB1IG1kPSJBY3Rpdm10eV8wNm1kOGV 0X2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMWxmMHB3NSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSIxMDQwIiB5PSI00TAiIHdpZHRoP SIxMDAiIGhlaWdodD0iODAiIC8+CiAgICAgICAgPGJwbW5kaTpCUE1OTGFiZWwgLz4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICA ${\tt gICA8YnBtbmRpOkJQTU5TaGFwZSBpZD@iQWN@aXZpdHlfMHdyN2N4b19kaSIgYnBtbkVsZW1lbnQ9IkFjdGl2aXR5XzFhcmc1ZjYiPgogII}$ CAgICAgIDxkYzpCb3VuZHMgeD0iMTYxMCIgeT0iNjMwIiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgICAgIDxicG1uZGk6QlB NTkxhYmVsIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkV2ZW50XzB1NGNwbThfZ GkiIGJwbW5FbGVtZW50PSJFdmVudF8wdTRjcG04Ij4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjE3NzIiIHk9IjY1MiIgd2lkdGg9IjM2IiB oZWlnaHQ9IjM2IiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJFdmVudF8wajM5b XhtX2RpIiBicG1uRWxlbWVudD0iRXZlbnRfMGozOW14bSI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSIxNDcyIiB5PSI2NTIiIHdpZHRoPSI zNiIgaGVpZ2h0PSIzNiIgLz4KICAgICAgICA8YnBtbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3VuZHMgeD0iMTQwMCIgeT0iN jU2IiB3aWR0aD0iNjIiIGhlaWdodD0iMjciIC8+CiAgICAgICAgPC9icG1uZGk6QlBNTkxhYmVsPgogICAgICA8L2JwbW5kaTpCUE1OU2h hcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJBY3Rpdml0eV8xaXZjaGc2X2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMHgxY $\verb|W010CI+CiAgICAgPGRjOkJvdW5kcyB4PSIxMDQwIiB5PSI4NDAiIHdpZHRoPSIxMDAiIGhlaWdodD0iODAiIC8+CiAgICAgPGJ| \\$ wbW5kaTpCUE1OTGFiZWwgLz4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRpOkJQTU5TaGFwZSBpZD0iVGV4dEFub m90YXRpb25fMXY5MDhzN19kaSIgYnBtbkVsZW1lbnQ9IlRleHRBbm5vdGF0aW9uXzF2OTA4czciPgogICAgICAgIDxkYzpCb3VuZHMgeD0 iMTUxMCIgeT0iNTc1IiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjcwIiAvPgogICAgIDxicG1uZGk6QlBNTkxhYmVsIC8+CiAgICAgIDwvY nBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18wZDVpank0X2RpIiBicG1uRWxlbWVudD0iRmxvd18 wZDVpank0Ij4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTg4IiB5PSI2NzAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjI2MCIge T0iNjcwIiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18wY20xN3FpX2RpIiB icG1uRWxlbWVudD0iRmxvd18wY20xN3FpIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMzYwIiB5PSI2NzAiIC8+CiAgICAgICAgPGRpO ndheXBvaW50IHg9IjQ1NCIgeT0iNjcwIiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0 iRmxvd18wcWhqc2RvX2RpIiBicG1uRWxlbWVudD0iRmxvd18wcWhqc2RvIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iOTEwIiB5PSIxM DIWIIAVPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxMDY1IiB5PSIxMDIwIiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICA gPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18wMDNr0XJkX2RpIiBicG1uRWxlbWVudD0iRmxvd18wMDNr0XJkIj4KICAgICAgICA8ZGk6d 2F5cG9pbnQgeD0iMTA5MCIgeT0iMTA0NSIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTA5MCIgeT0iMTExMCIgLz4KICAgICAgICA 8YnBtbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3VuZHMgeD0iMTA5NyIgeT0iMTA0NCIgd2lkdGg9IjE4IiBoZWlnaHQ9IjE0I iAvPgogICAgICAgIDwvYnBtbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2U gaWQ9IkZsb3dfMHlyZWE2Y19kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMHlyZWE2YyI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjY3MCIge T0iNjk1IiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI2NzAiIHk9IjEwMjAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjgxMCI geT0iMTAyMCIgLz4KICAgICAgPC9icG1uZGk6Q1BNTkVkZ2U+CiAgICAgIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMGw1aWJvNl9ka SIgYnBtbkVsZW1lbnQ9IkZsb3dfMGw1aWJvNiI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjkxMCIgeT0iNzUwIiAvPgogICAgICAgIDx kaTp3YXlwb2ludCB4PSIxMDY1IiB5PSI3NTAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlI GlkPSJGbG93XzB2azZqNjJfZGkiIGJwbW5FbGVtZW50PSJGbG93XzB2azZqNjIiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxMDkwIiB 5PSI3NzUiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjEWOTAiIHk9Ijg0MCIgLz4KICAgICAgICA8YnBtbmRpOkJQTU5MYWJ1bD4KI 6Q1BNTkxhYmVsPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18xaTFjMmd3X2RpI iBicG1uRWxlbWVudD0iRmxvd18xaTFjMmd3Ij4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNjcwIiB5PSI2NDUiIC8+CiAgICAgICAgPGR pOndheXBvaW50IHg9IjY3MCIgeT0iMzkwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI4MTAiIHk9IjM5MCIgLz4KICAgICAgPC9ic G1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMWUyb251a19kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMWU yb251ayI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjY3MCIgeT0iNjQ1IiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI2NzAiIHk9I jE0MCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iODEwIiB5PSIxNDAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA 8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzF3eGprNHpfZGkiIGJwbW5FbGVtZW50PSJGbG93XzF3eGprNHoiPgogICAgICAgIDxkaTp3Y Xlwb2ludCB4PSI5MTAiIHk9IjE0MCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTA2NSIgeT0iMTQwIiAvPgogICAgICA8L2JwbW5 kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18xOGZ6NjJ0X2RpIiBicG1uRWxlbWVudD0iRmxvd18xOGZ6N jJ01j4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iOTEwIiB5PSIzOTAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjEwNjUiIHk9IjM 5MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMXViYXpqNV9kaSIgYnBtb kVsZW1lbnQ9IkZsb3dfMXViYXpqNSI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjU1NCIgeT0iNjcwIiAvPgogICAgICAgIDxkaTp3YXl wb2ludCB4PSI2NDUiIHk9IjY3MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb 3dfMXhndWE10V9kaSIgYnBtbkVsZW11bnQ9IkZsb3dfMXhndWE10SI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjEwOTAiIHk9IjQxNSI gLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTA5MCIgeT0iNDkwIiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgI CAgPGRjOkJvdW5kcyB4PSIxMDk2IiB5PSI0NTAiIHdpZHRoPSIxOCIgaGVpZ2h0PSIxNCIgLz4KICAgICAgICA8L2JwbW5kaTpCUE10TGF iZWw+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzBrdXB1ejNfZGkiIGJwbW5Fb GVtZW50PSJGbG93XzBrdXB1ejMiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxMTQwIiB5PSIyNzAiIC8+CiAgICAgICAgPGRpOndheXB vaW50IHg9IjE0OTAiIHk9IjI3MCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTQ5MCIgeT0iNjUwIiAvPgogICAgICA8L2JwbW5ka TpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18xN3NyNDZzX2RpIiBicG1uRWx1bWVudD0iRmxvd18xN3NyNDZ zIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTcxMCIgeT0iNjcwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxNzcyIiB5PSI2N





zAiIC8+CiAgICAgIDwvYnBtbmRp0kJQTU5FZGdlPgogICAgICA8YnBtbmRp0kJQTU5FZGdlIGlkPSJGbG93XzF0anNy0GdfZGkiIGJwbW5 FbGVtZW50PSJGbG93XzF0anNyOGciPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxMTE1IiB5PSIxMDIwIiAvPgogICAgICAgIDxkaTp3Y Xlwb2ludCB4PSIxNDkwIiB5PSIxMDIwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxNDkwIiB5PSI2ODgiIC8+CiAgICAgICAgPGJ wbW5kaTpCUE10TGFiZWw+CiAgICAgICAgICAgZGM6Qm91bmRzIHg9IjExMjIiIHk9IjEwMDUiIHdpZHRoPSIxNSIgaGVpZ2h0PSIxNCIgL z4KICAgICAgICA8L2JwbW5kaTpCUE1OTGFiZWw+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGl kPSJGbG93XzAwZW16YzRfZGkiIGJwbW5FbGVtZW50PSJGbG93XzAwZW16YzQiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxMTE11iB5P SI3NTAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjE00TAiIHk9Ijc1MCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTQ5MCI geT0iNjg4IiAvPgogICAgICAgIDxicG1uZGk6QlBNTkxhYmVsPgogICAgICAgICAgPGRj0kJvdW5kcyB4PSIxMTI2IiB5PSI3MjgiIHdpZ HRoPSIxNSIgaGVpZ2h0PSIxNCIgLz4KICAgICAgICAgICASL2JwbW5kaTpCUE10TGFiZWw+CiAgICAgIDwvYnBtbmRp0kJQTU5FZGdlPgogICAgIDwydlPgogICAgIDwydlPgogICAgIDwydlPgogICAgIDwydlPgogICAgIDwydlPgogICAgIDwydlPgogICAgIDwydlPgogICAgIDwydlPgogICAgIDwydlPgogICAgIDwydlAgIDwydlPgogICAgIDwydlPgogICAgIDwydlPgogIgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzAzYzZ5YXlfZGkiIGJwbW5FbGVtZW50PSJGbG93XzAzYzZ5YXkiPgogICAgICAgIDxka Tp3YXlwb2ludCB4PSIxMDkwIiB5PSIxNjUiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjEwOTAiIHk9IjIzMCIgLz4KICAgICAgICA 8YnBtbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3VuZHMgeD0iMTA5NyIgeT0iMTk3IiB3aWR0aD0iMTgiIGhlaWdodD0iMTQiI ${\tt C8+CiAgICAgICAgPC9icG1uZGk6Q1BNTkxhYmVsPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSB} \\$ pZD0iRmxvd18waGU0a2R4X2RpIiBicG1uRWxlbWVudD0iRmxvd18waGU0a2R4Ij4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNjcwIiB5P SI2OTUiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjY3MCIgeT0iNzUwIiAvPgogICAgICAgIDxkaTp3YX1wb2ludCB4PSI4MTAiIHk 9Ijc1MCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMHYzbGlnMl9kaSIgY nBtbkVsZW11bnQ9IkZsb3dfMHYzbG1nMiI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjExNDAiIHk9Ijg4MCIgLz4KICAgICAgICA8ZGk 6d2F5cG9pbnQgeD0iMTQ5MCIgeT0iODgwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxNDkwIiB5PSI2ODgiIC8+CiAgICAgIDwvY nBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzAydHhlazFfZGkiIGJwbW5FbGVtZW50PSJGbG93XzA ydHhlazEiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxMTQwIiB5PSIxMTUwIiAvPgogICAgIDxkaTp3YXlwb2ludCB4PSIxNDkwI iB5PSIxMTUwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxNDkwIiB5PSI2ODgiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgo gICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzBxYnAyeTRfZGkiIGJwbW5FbGVtZW50PSJGbG93XzBxYnAyeTQiPgogICAgICAgI DxkaTp3YX1wb21udCB4PSIxNTA4IiB5PSI2NzAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjE2MTAiIHk9IjY3MCIgLz4KICAgICA gPC9icG1uZGk6Q1BNTkVkZ2U+CiAgICAgIDxicG1uZGk6Q1BNTkVkZ2UgaWQ9IkZsb3dfMTF1d2VuN19kaSIgYnBtbkVsZW11bnQ9IkZsb 3dfMTFld2VuNiI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjEwOTAiIHk9IjQ5MCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTA 5MCIgeT0iNDE1IiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18xbm9mcXBmX 2RpIiBicG1uRWxlbWVudD0iRmxvd18xbm9mcXBmIj4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iMTE0MCIgeT0iNTMwIiAvPgogICAgICA gIDxkaTp3YXlwb2ludCB4PSIxNDkwIiB5PSI1MzAiIC8+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjE00TAiIHk9IjY1MiIgLz4KICAgI sb3dfMXJxdGNwaiI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjExMTUiIHk9IjE0MCIgLz4KICAgICAgICAgZGk6d2F5cG9pbnQgeD0iM TQ5MCIgeT0iMTQwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxNDkwIiB5PSI2NTIiIC8+CiAgICAgICAgPGJwbW5kaTpCUE1OTGF iZWw+CiAgICAgICAgICA8ZGM6Qm91bmRzIHg9IjExMjciIHk9IjEyMiIgd2lkdGg9IjE1IiBoZWlnaHQ9IjE0IiAvPgogICAgICAgIDwvY nBtbmRpOkJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb3dfMHZjdG1 4ZF9kaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMHZjdG14ZCI+CiAgICAgICAgPGRpOndheXBvaW50IHg9IjExMTUiIHk9IjM5MCIgLz4KICAgI CAgICA8ZGk6d2F5cG9pbnQgeD0iMTQ5MCIgeT0iMzkwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxNDkwIiB5PSI2NTIiIC8+CiA gICAgICAgPGJwbW5kaTpCUE1OTGFiZWw+CiAgICAgICAgICA8ZGM6Qm91bmRzIHg9IjExMjIiIHk9IjM3MiIgd2lkdGg9IjE1IiBoZWlna HQ9IjE0IiAvPgogICAgICAgIDwvYnBtbmRp0kJQTU5MYWJlbD4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlB NTKVKZ2UgaWQ9IkFzc29jaWF0aW9uXzFzcDhvdGZfZGkiIGJwbW5FbGVtZW50PSJBc3NvY2lhdGlvb18xc3A4b3RmIj4KICAgICAgICA8Z Gk6d2F5cG9pbnQgeD0iMTUwMiIgeT0iNjU3IiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxNTEyIiB5PSI2NDUiIC8+CiAgICAgIDw

```
"playbook_abstraction": "template",
      "playbook creation time": "2022-03-31T13:00:00.000Z",
      "playbook_modification_time": "2022-03-31T13:00:00.000Z",
      "revoked": false,
      "playbook_creator": "identity--b085a68a-bf48-4316-9667-37af78cba894",
      "extensions": {
        extension-definition--809C4D84-7A6E-4039-97B4-DA9FEA03FCF9": {
           'extension_type": "new-sdo"
     }
   },
      "type": "course-of-action",
      "spec_version": "2.1",
      "id": "course-of-action--94D890AC-3E24-4DEC-8ACB-C603FA4A7B20",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "name": "Mitigate Incident",
      "description": "Analyst mitigates the alert by blocking malicious IPs, sharing data, and/or
remediating the affected system.",
      "extensions": {
        "extension-definition--BBC1D5C8-7DDC-4E89-BE9C-F33AD02D71DD": {
          "extension_type": "property-extension",
          "playbooks": {
            "CACAO": "x-oca-playbook--AE16A784-BAC9-4334-A09F-7CB63053A6D7",
            "BPMN": "x-oca-playbook--720E5E68-3959-4EE0-99DE-87A4EAA39F44"
          }
```



}



```
}
   },
      "type": "relationship",
      "spec_version": "2.1"
     "id": "relationship--8DE4A689-FDA3-45B9-8FE2-4A519884CEA7",
     "created": "2022-03-31T13:00:00.000Z",
     "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "related-to",
      "source_ref": "x-oca-playbook--AE16A784-BAC9-4334-A09F-7CB63053A6D7"
     "target_ref": "course-of-action--94D890AC-3E24-4DEC-8ACB-C603FA4A7B20"
   },
     "type": "relationship",
     "spec_version": "2.1"
     "id": "relationship--92C59855-392E-490A-964C-F9E3B3D202BF",
     "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "related-to",
     "source_ref": "x-oca-playbook--720E5E68-3959-4EE0-99DE-87A4EAA39F44",
     "target_ref": "course-of-action--94D890AC-3E24-4DEC-8ACB-C603FA4A7B20"
   },
     "type": "relationship",
     "spec_version": "2.1",
     "id": "relationship--6317A9AC-6763-4551-B004-CA2AA45B3510",
      "created": "2022-03-31T13:00:00.000Z"
     "modified": "2022-03-31T13:00:00.000Z",
     "relationship_type": "related-to",
      "source_ref": "course-of-action--4E202C5A-C1DF-42D8-9AEF-809A8E172AE3",
      "target_ref": "course-of-action--94D890AC-3E24-4DEC-8ACB-C603FA4A7B20"
   },
     "type": "x-oca-playbook",
      "spec_version": "2.1",
     "id": "x-oca-playbook--9880DF48-09A7-4E99-8070-0DB8F4C946D0",
     "created": "2022-03-31T13:00:00.000Z",
     "modified": "2022-03-31T13:00:00.000Z",
      "name": "Quarantine and remediate",
      description": "Remediate by quarantining and performing analyst guided steps. Optionally checks"
configuration management and attempts to automatically rebuild if necessary.",
      "playbook id": "playbook--767d859e-7387-4e0c-95c0-458ca369486f",
      "playbook_format": "CACAO",
      "playbook_type": [
        "remediation"
ewogICJ0eXBlIjogInBsYXlib29rIiwKICAic3BlY192ZXJzaW9uIjogIjEuMCIsCiAgImlkIjogInBsYXlib29rLS03NjdkODU5ZS03W"
```

zg3LTR1MGMtOTVjMC00NThjYTM2OTQ4NmYiLAogICJuYW11IjogIlByb2Nlc3NfMTgxMWY4dzogUXVhcmFudGluZSBhbmQgUmVtZWRpYXR lIiwKICAiZGVzY3JpcHRpb24iOiAiIiwKICAicGxheWJvb2tfdHlwZXMiOiBbICJtaXRpZ2F0aW9uIiwgInJlbWVkaWF0aW9uIiBdLAogI CJjcmVhdGVkX2J5IjogImlkZW50aXR5LS1iMDg1YTY4YS1iZjQ4LTQzMTYtOTY2Ny0zN2FmNzhjYmE4OTQiLAogICJjcmVhdGVkIjogIjI wMjItMDMtMzFUMTM6MDA6MDAuMDAwWiIsCiAgIm1vZGlmaWVkIjogIjIwMjItMDMtMzFUMTM6MDA6MDAuMDAwWiIsCiAgIndvcmtmbG93X 3N0YXJ0IjogInN0YXJ0LS11Y2U1MzJkZi05NzBhLTQxN2MtYTEyNS01ZTc3MTN1MTBmN2MiLAogICJ3b3JrZmxvdyI6IHsKICAgICJzdGF ydC0tZWNlNTMyZGYtOTcwYS00MTdjLWExMjUtNWU3NzEzZTEwZjdjIjogewogICAgICAidHlwZSI6ICJzdGFydCIsCiAgICAgICJuYW1lI jogIlN0YXJ0RXZlbnRfMTogU3lzdGVtIENvdXJzZSBvZiBBY3Rpb24gQWxlcnQiLAogICAgICAib25fY29tcGxldGlvbiI6ICJzaW5nbGU tLWQyMjQwOGZjLWE5OWMtNGM0NS04NzcwLTI3ZGFjNmRmMjkzYSIKICAgIH0sCiAgICAiZW5kLS00ZDMxMzRkOS02OGQyLTRiZGUtODdjY S1hNWJmZTg0NjhhYTYiOiB7CiAgICAgICJ0eXBlIjogImVuZCIsCiAgICAgICJUYW1lIjogIkV2ZW50XzE3enBzbjU6IEVuZCIKICAgIH0 sCiAgICAic2luZ2xlLS1kMjI0MDhmYy1hOTljLTRjNDUtODc3MC0yN2RhYzZkZjI5M2EiOiB7CiAgICAgICJ0eXBlIjogInNpbmdsZSIsC iAgICAgICJuYW1lIjogIkFjdGl2aXR5XzF2djh5eXo6IFF1YXJhbnRpbmUgc3lzdGVtIiwKICAgICAgImNvbW1hbmRzIjogW3sKICAgICA gICAidHlwZSI6ICJodHRwLWFwaSIKICAgICAgfV0sCiAgICAgICJvbl9jb21wbGV0aW9uIjogInNpbmdsZS0tZDFkMTVhYjctYjU1Ny00Z jgyLThkOWItNDk1NDM4YTVjOWE5IgogICAgfSwKICAgICJzaW5nbGUtLWQxZDE1YWI3LWI1NTctNGY4Mi04ZDliLTQ5NTQzOGE1YzlhOSI 6IHsKICAgICAgInR5cGUiOiAic2luZ2xlIiwKICAgICAgIm5hbWUiOiAiQWN0aXZpdHlfMGk5MWdlbjogQ3JlYXRlIHRpY2tldCIsCiAgI zaW5nbGUtLTNlZmJlMDU2LTZkMWUtNDQwNy04OWJiLWJiNTQwMTZkOWRlYSIKICAgIH0sCiAgICAic2luZ2xlLS0zZWZiZTA1Ni02ZDFlL TQ0MDctODliYi1iYjU0MDE2ZDlkZWEi0iB7CiAgICAgICJ0eXBlIjogInNpbmdsZSIsCiAgICAgICJuYW1lIjogIkFjdGl2aXR5XzFqZnl nMHk6IENvbW11bnQgaW4gdGlja2V0IHRoYXQgc3lzdGVtIGlzIHF1YXJhbnRpbmVkIiwKICAgICAgImNvbW1hbmRzIjogW3sKICAgICAgI CAidHlwZSI6ICJodHRwLWFwaSIKICAgICAgfV0sCiAgICAgICJvbl9jb21wbGV0aW9uIjogInNpbmdsZS0tMjdmODI3OGMtOGI4Ny00ODE





1LThmNDAtOWM2YWY2MTAyMDN1IgogICAgfSwKICAgICJzaW5nbGUtLWZ1YzU2ZDNkLTO3YTOtNGY0Yi1hMGE3LWViNDI2OThjMWU4Yi16I HskICAgICAgInR5cGUiOiAic2luZ2xlIiwKICAgICAgIm5hbWUiOiAiQWN0aXZpdHlfMHV2bWNuZTogUmVtb3ZlIHF1YXJhbnRpbmUgZnJ vbSBzeXN0ZW0iLAogICAgICAiY29tbWFuZHMiOiBbewogICAgICJ0eXBlIjogImh0dHAtYXBpIgogICAgICB9XSwKICAgICAgIm9uX 2NvbXBsZXRpb24i0iAic2luZ2xlLS0zZjBlODNkYS01YzM3LTQ4MTYtOWQ4ZS03ZjU1ZWY0Yjc3YTQiCiAgICB9LAogICAgInNpbmdsZS0 tM2YwZTgzZGEtNWMzNy000DE2LT1kOGUtN2Y1NWVmNGI3N2E0IjogewogICAgICAidH1wZSI6ICJzaW5nbGUiLAogICAgICAibmFtZSI6I ${\tt CJBY3Rpdml@eV8xdWZ1MGRzOiBDb21tZW50IGluIHRpY2tldCB@aGF0IHN5c3RlbSBpcyByZXN@b3JlZCBhbmQgdGhlIHF1YXJhbnRpbmUachter and the control of the$ gaXMgcmVtb3Z1ZCIsCiAgICAgICJjb21tYW5kcyI6IFt7CiAgICAgICAgInR5cGUiOiAiaHR0cC1hcGkiCiAgICAgIH1dLAogICAgICAib 25fY29tcGxldGlvbi16ICJzaW5nbGUtLWI3OTE4MTM0LTM4MDctNDQzMi1iNDdlLThhNGZlZjI2ODAzNSIKICAgIH0sCiAgICAic2luZ2x llS1iNzkxODEzNC0zODA3LTQ0MzItYjQ3ZS04YTRmZWYyNjgwMzUiOiB7CiAgICAgICJ0eXBlIjogInNpbmdsZSIsCiAgICAgICJuYW1lI jogIkFjdGl2aXR5XzA3dnJpZXk6IENsb3NlIHRpY2tldCIsCiAgICAgICJjb21tYW5kcyI6IFt7CiAgICAgICAgInR5cGUi0iAiaHR0cC1 hcGkiCiAgICAgIH1dLAogICAgICAib25fY29tcGxldGlvbiI6ICJlbmQtLTRkMzEzNGQ5LTY4ZDItNGJkZS04N2NhLWE1YmZlODQ2OGFhN iIKICAgIH0sCIAgICAic2luZ2xlLs03M2ZjYmVkNC0zOTNiLTRiY2QtODhlMi02OTMxNGM4ZTgyN2Mi0iB7CiAgICAgICJ0eXBlIjogInN pbmdsZSIsCiAgICAgICJuYW1lIjogIkFjdGl2aXR5XzE1MjY2OG46IFNPQyBhbmFseXN0IHJlc3RvcmVzIGFmZmVjdGVkIHN5c3RlbSIsC iAgICAgICJjb21tYW5kcyI6IFt7CiAgICAgICAgIR5cGUi0iAibWFudWFsIgogICAgICB9XSwKICAgICAgIm9uX2NvbXBsZXRpb24i0iA ic2luZ2xlLS1mZWM1NmQzZC00N2E0LTRmNGItYTBhNy1lYjQyNjk4YzFlOGIiCiAgICB9LAogICAgInNpbmdsZS0tMjdmODI3OGMtOGI4N y000DE1LThmNDAtOWM2YWY2MTAyMDNlIjogewogICAgICAidHlwZSI6ICJzaW5nbGUiLAogICAgICAibmFtZSI6ICJBY3Rpdml0eV8xMmxuMW9zOiBTZW5kIGVtYWlsIHRvIFNPQyBhbmFseXN0IHRvIHJldmlldyB0aWNrZXQiLAogICAgICAiY29tbWFuZHMiOiBbewogICAgICAgI ${\tt CJ0eXB1IjogImh0dHAtYXBpIgogICAgICB9XSwKICAgICAgIm9uX2NvbXBsZXRpb24i0iAic21uZ2xlLs03M2ZjYmVkNC0zOTNiLTRiY2Q1} \\$ tODhlMi02OTMxNGM4ZTgyN2MiCiAgICB9CiAgfQp9Cg==",

```
"playbook_abstraction": "template",
      "playbook creation time": "2022-03-31T13:00:00.000Z",
      "playbook_modification_time": "2022-03-31T13:00:00.000Z",
      "revoked": false,
      "playbook_creator": "identity--b085a68a-bf48-4316-9667-37af78cba894",
      "extensions": {
        "extension-definition--809C4D84-7A6E-4039-97B4-DA9FEA03FCF9": \{
          "extension_type": "new-sdo"
     }
    },
      "type": "x-oca-playbook",
      "spec_version": "2.1",
      "id": "x-oca-playbook--32F52089-9943-4231-BBA3-5C02BA654755",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "name": "Quarantine and remediate",
      "playbook_id": "33624770-3AFE-4F63-8E63-F00915162F01",
      "description": "Remediate by quarantining and performing analyst guided steps. Optionally checks
configuration management and attempts to automatically rebuild if necessary.",
      'playbook format": "BPMN",
      "playbook_type": [
        "remediation"
      "playbook_bin":
```

"PD94bWwgdmVyc2lvbj0iMS4wIiBlbmNvZGluZz0iVVRGLTgiPz4KPGJwbW46ZGVmaW5pdGlvbnMgeG1sbnM6YnBtbj0iaHR0cDovL3d3d" y5vbWcub3JnL3NwZWMvQlBNTi8yMDEwMDUyNC9NT0RFTCIgeG1sbnM6YnBtbmRpPSJodHRwOi8vd3d3Lm9tZy5vcmcvc3BlYy9CUE10LzI wMTAwNTI0L0RJIiB4bWxuczpkYz0iaHR0cDovL3d3dy5vbWcub3JnL3NwZWMvREQvMjAxMDA1MjQvREMiIHhtbG5zOnp1ZWJ1PSJodHRwO i8vY2FtdW5kYS5vcmcvc2NoZW1hL3plZWJlLzEuMCIgeG1sbnM6ZGk9Imh0dHA6Ly93d3cub21nLm9yZy9zcGVjL0RELzIwMTAwNTI0L0R JIiB4bWxuczptb2RlbGVyPSJodHRw0i8vY2FtdW5kYS5vcmcvc2NoZW1hL21vZGVsZXIvMS4wIiBpZD0iRGVmaW5pdGlvbnNfMTN1dGs5Y iIgdGFyZ2V0TmFtZXNwYWN1PSJodHRwOi8vYnBtbi5pby9zY2h1bWEvYnBtbiIgZXhwb3J0ZXI9IkNhbXVuZGEgTW9kZWx1ciIgZXhwb3J 0ZXJWZXJzaW9uPSI1LjUuMSIgbW9kZWxlcjpleGVjdXRpb25QbGF0Zm9ybT0iQ2FtdW5kYSBDbG91ZCIgbW9kZWxlcjpleGVjdXRpb25Qb GF0Zm9ybVZlcnNpb249IjguMS4wIj4KICA8YnBtbjpwcm9jZXNzIGlkPSJQcm9jZXNzXzE4MTFm0HciIG5hbWU9I1N5c3RlbSBjb3Vyc2U gb2YgYWN0aW9uIGFsZXJ0IiBpc0V4ZWN1dGFibGU9InRydWUiPgogICAgPGJwbW46c3RhcnRFdmVudCBpZD0iU3RhcnRFdmVudF8xIiBuY W11PSJTeXN0ZW0gQ291cnNlIG9mIEFjdGlvbiBBbGVydCI+CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMWoxZzdkaDwvYnBtbjpvdXR nb2luZz4KICAgIDwvYnBtbjpzdGFydEV2ZW50PgogICAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzFycXRpcmwiIHNvdXJjZVJlZ j0iQWN0aXZpdHlfMGk5MWdlbiIgdGFyZ2V0UmVmPSJBY3Rpdml0eV8xamZ5ZzB5IiAvPgogICAgPGJwbW46c2VxdWVuY2VGbG93IGlkPSJ GbG93XzFqMWc3ZGgiIHNvdXJjZVJlZj0iU3RhcnRFdmVudF8xIiB0YXJnZXRSZWY9IkFjdGl2aXR5XzF2djh5eXoiIC8+CiAgICA8YnBtb jpzZXJ2aWNlVGFzayBpZD0iQWN0aXZpdHlfMXZ2OHl5eiIgbmFtZT0iUXVhcmFudGluZSBzeXN0ZW0iPgogICAgICA8YnBtbjpleHRlbnN pb25FbGVtZW50cz4KICAgICAgICA8emV1YmU6dGFza0R1Zm1uaXRpb24gdH1wZT0iZWRyIiAvPgogICAgICA8L2JwbW46ZXh0ZW5zaW9uRWxlbWVudHM+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMWoxZzdkaDwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc +Rmxvd18wZ2wxbnFvPC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnNlcnZpY2VUYXNrPgogICAgPGJwbW46c2VydmljZVRhc2sgaWQ9I kFjdGl2aXR5XzBpOTFnZW4iIG5hbWU9IkNyZWF0ZSB0aWNrZXQiPgogICAgICA8YnBtbjpleHRlbnNpb25FbGVtZW50cz4KICAgICAgICA 8emVlYmU6dGFza0R1ZmluaXRpb24gdHlwZT0idGlja2V0aW5nIiAvPgogICAgICA8L2JwbW46ZXh0ZW5zaW9uRWxlbWVudHM+CiAgICAgI DxicG1uOmluY29taW5nPkZsb3dfMGdsMW5xbzwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xcnF0aXJsPC9 icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnNlcnZpY2VUYXNrPgogICAgPGJwbW46c2VydmljZVRhc2sgaWQ9IkFjdGl2aXR5XzFqZnlnM HkiIG5hbWU9IkNvbW1lbnQgaW4gdG1ja2V0IHRoYXQgc3lzdGVtIGlzIHF1YXJhbnRpbmVkIj4KICAgICAgPGJwbW46ZXh0ZW5zaW9uRWx lbWVudHM+CiAgICAgICAgICAgPC9icG1uOmV4dGVuc21vb





kVsZW11bnRzPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzFycXRpcmw8L2JwbW46aW5jb21pbmc+CiAgICAgIDxicG1uOm91dGdvaW5 nPkZsb3dfMDA3MjFoODwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjpzZXJ2aWNlVGFzaz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZ D0iRmxvd18wMDcyMWg4IiBzb3VyY2VSZWY9IkFjdGl2aXR5XzFqZnlnMHkiIHRhcmdldFJlZj0iQWN0aXZpdHlfMTJsbjFvcyIgLz4KICA gIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18wZWFyMDg3IiBzb3VyY2VSZWY9IkFjdGl2aXR5XzEybG4xb3MiIHRhcmdldFJlZj0iQ WN0aXZpdHlfMTUyNjY4biIgLz4KICAgIDxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18xY3NiMG9sIiBzb3VyY2VSZWY9IkFjdGl2aXR 5XzE1MjY2OG4iIHRhcmdldFJlZj0iQWN0aXZpdHlfMHV2bWNuZSIgLz4KICAgIDxicG1uOnNlcnZpY2VUYXNrIGlkPSJBY3Rpdml0eV8wd XZ t Y 25111 i Bu Y W 11 P S J S Z W 1 v d m U g c X V h c m F u d G l u Z S B m c m 9 t I H N 5 c 3 R l b S I + C i A g I C A g I D X i C G 1 u 0 m V 4 d G V u c 2 l v b k V s Z W 1 l b n R z P g o g I C A g I CgICAgIDx6ZWViZTp0YXNrRGVmaW5pdGlvbiB0eXBlPSJlZHIiIC8+CiAgICAgIDwvYnBtbjpleHRlbnNpb25FbGVtZW50cz4KICAgICAgP GJwbW46aW5jb21pbmc+Rmxvd18xY3NiMG9sPC9icG1u0mluY29taW5nPgogICAgICA8YnBtbjpvdXRnb21uZz5GbG93XzFjZThxdWw8L2J wbW46b3V0Z29pbmc+CiAgICA8L2JwbW46c2VydmljZVRhc2s+CiAgICA8YnBtbjpzZW5kVGFzayBpZD0iQWN0aXZpdHlfMTJsbjFvcyIgb mFtZT0iU2VuZCBlbWFpbCB0byBTT0MgYW5hbHlzdCB0byByZXZpZXcgdGlja2V0Ij4KICAgICAgPGJwbW46ZXh0ZW5zaW9uRWxlbWVudHM +CiAgICAgICAgPHplZWJlOnRhc2tEZWZpbml0aW9uIHR5cGU9ImVtYWlsIiAvPgogICAgICA8L2JwbW46ZXh0ZW5zaW9uRWxlbWVudHM+C iAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMDA3MjFoODwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18wZWF yMDg3PC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnNlbmRUYXNrPgogICAgPGJwbW46dXNlclRhc2sgaWQ9IkFjdG12aXR5XzE1MjY2O G4iIG5hbWU9IlNPQyBhbmFseXN0IHJlc3RvcmVzIGFmZmVjdGVkIHN5c3RlbSI+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMGVhcjA 4 NzwvYnBtbjppbmNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18xY3NiMG9sPC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOm91dGnVzZXJUYXNrPgogICAgPGJwbW46c2VxdWVuY2VGbG93IG1kPSJGbG93XzFjZThxdWwiIHNvdXJjZVJ1Zj0iQWN0aXZpdH1fMHV2bWNuZSI gdGFyZ2V0UmVmPSJBY3Rpdml0eV8xdWZ1MGRzIiAvPgogICAgPGJwbW46c2VydmljZVRhc2sgaWQ9IkFjdGl2aXR5XzF1ZnUwZHMiIG5hb WU9IkNvbW1lbnQgaW4gdGlja2V0IHRoYXQgc3lzdGVtIGlzIHJlc3RvcmVkIGFuZCB0aGUgcXVhcmFudGluZSBpcyByZW1vdmVkIj4KICA gICAgPGJwbW46ZXh0ZW5zaW9uRWxlbWVudHM+CiAgICAgICAgPHplZWJlOnRhc2tEZWZpbml0aW9uIHR5cGU9InRpY2tldGluZyIgLz4KI CAgICAgPC9icG1uOmV4dGVuc2lvbkVsZW1lbnRzPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzFjZThxdWw8L2JwbW46aW5jb21pbmc +CiAgICAgIDxicG1uOm91dGdvaW5nPkZsb3dfMGgwc3RuYjwvYnBtbjpvdXRnb2luZz4KICAgIDwvYnBtbjpzZXJ2aWNlVGFzaz4KICAgI DxicG1uOnNlcXVlbmNlRmxvdyBpZD0iRmxvd18waDBzdG5iIiBzb3VyY2VSZWY9IkFjdGl2aXR5XzF1ZnUwZHMiIHRhcmdldFJlZj0iQWN @aXZpdHlfMDd2cmlleSIgLz4KICAgIDxicG1uOnNlcnZpY2VUYXNrIGlkPSJBY3Rpdml@eV8wN3ZyaWV5IiBuYW11PSJDbG9zZSB@aWNrZ XQiPgogICAgICA8YnBtbjpleHRlbnNpb25FbGVtZW50cz4KICAgICAgICA8emVlYmU6dGFza0RlZmluaXRpb24gdHlwZT0idGlja2V0aW5 nIiAvPgogICAgICA8L2JwbW46ZXh0ZW5zaW9uRWxlbWVudHM+CiAgICAgIDxicG1uOmluY29taW5nPkZsb3dfMGgwc3RuYjwvYnBtbjppb mNvbWluZz4KICAgICAgPGJwbW46b3V0Z29pbmc+Rmxvd18wdmlqOHpnPC9icG1uOm91dGdvaW5nPgogICAgPC9icG1uOnNlcnZpY2VUYXN rPgogICAgPGJwbW46ZW5kRXZlbnQgaWQ9IkV2ZW50XzE3enBzbjUiPgogICAgICA8YnBtbjppbmNvbWluZz5GbG93XzB2aWo4emc8L2Jwb $\label{thm:washing} W46aW5jb21pbmc+CiAgICA8L2JwbW46ZW5kRXZ1bnQ+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9IkZsb3dfMHZpajh6ZyIgc291cmNables and the control of the$ lumVmPSJBY3Rpdm10eV8wN3ZyaWV5IiB0YXJnZXRSZWY9IkV2ZW50XzE3enBzbjUiIC8+CiAgICA8YnBtbjpzZXF1ZW5jZUZsb3cgaWQ9I kZsb3dfMGdsMW5xbyIgc291cmNlUmVmPSJBY3Rpdml0eV8xdnY4eXl6IiB0YXJnZXRSZWY9IkFjdGl2aXR5XzBpOTFnZW4iIC8+CiAgPC9 icG1uOnByb2Nlc3M+CiAgPGJwbW5kaTpCUE1ORGlhZ3JhbSBpZD0iQlBNTkRpYWdyYW1fMSI+CiAgICA8YnBtbmRpOkJQTU5QbGFuZSBpZ D0iQlBNTlBsYW51XzEiIGJwbW5FbGVtZW50PSJQcm9jZXNzXzE4MTFm0HciPgogICAgICA8YnBtbmRp0kJQTU5TaGFwZSBpZD0iRXZlbnR fMTd6cHNuNV9kaSIgYnBtbkVsZW1lbnQ9IkV2ZW50XzE3enBzbjUiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iMTQzMiIgeT0iMTEyIiB3a WR0aD0iMzYiIGhlaWdodD0iMzYiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkF jdGl2aXR5XzEwYXg2OXBfZGkiIGJwbW5FbGVtZW50PSJBY3Rpdml0eV8wN3ZyaWV5Ij4KICAgICAgICA8ZGM6Qm91bmRzIHg9IjEyODAiI Hk9IjkwIiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgICAgIDxicG1uZGk6Q1BNT1N oYXBlIGlkPSJBY3Rpdml0eV8wbDBhbjV1X2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMXVmdTBkcyI+CiAgICAgICAgPGRj0kJvdW5kc yB4PSIxMTMwIiB5PSI5MCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLZ4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnB tbmRpOkJQTU5TaGFwZSBpZD0iQWN0aXZpdHlfMGtrZm11N19kaSIgYnBtbkVsZW1lbnQ9IkFjdGl2aXR5XzB1dm1jbmUiPgogICAgICAgI DxkYzpCb3VuZHMgeD0iOTkwIiB5PSI5MCIgd2lkdGg9IjEwMCIgaGVpZ2h0PSI4MCIgLz4KICAgICAgICA8YnBtbmRpOkJQTU5MYWJlbCA vPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJBY3Rpdml0eV8wcGhhaDk1X2RpIiBic G1uRWxlbWVudD0iQWN0aXZpdHlfMTUyNjY4biI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSI4NTAiIHk9IjkwIiB3aWR0aD0iMTAwIiBoZWl naHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJBY3Rpdml0eV8xZXNlZ G1zX2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMTJsbjFvcyI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSI3MDAiIHk9IjkwIiB3aWR0aD0 iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE1OU2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlIGlkPSJBY3Rpd wIiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgICA8L2JwbW5kaTpCUE10U2hhcGU+CiAgICAgIDxicG1uZGk6QlBNTlNoYXBlI GlkPSJBY3Rpdml0eV8wc3dyeTU2X2RpIiBicG1uRWxlbWVudD0iQWN0aXZpdHlfMGk5MWdlbiI+CiAgICAgICAgPGRjOkJvdW5kcyB4PSI zODAiIHk9IjkwIiB3aWR0aD0iMTAwIiBoZWlnaHQ9IjgwIiAvPgogICAgICAgIDxicG1uZGk6Q1BNTkxhYmVsIC8+CiAgICAgIDwvYnBtb mRpOkJQTU5TaGFwZT4KICAgICAgPGJwbW5kaTpCUE10U2hhcGUgaWQ9IkFjdGl2aXR5XzA1eDZkOTNfZGkiIGJwbW5FbGVtZW50PSJBY3R pdml0eV8xdnY4eXl6Ij4KICAgICAgICAgZGM6Qm91bmRzIHg9IjIzMCIgeT0i0TAiIHdpZHRoPSIxMDAiIGhlaWdodD0i0DAiIC8+CiAgI CAgICAgPGJwbW5kaTpCUE10TGFiZWwgLz4KICAgICAgPC9icG1uZGk6QlBNTlNoYXBlPgogICAgICA8YnBtbmRp0kJQTU5TaGFwZSBpZD0 iX0JQTU5TaGFwZV9TdGFydEV2ZW50XzIiIGJwbW5FbGVtZW50PSJTdGFydEV2ZW50XzEiPgogICAgICAgIDxkYzpCb3VuZHMgeD0iMTQyI iB5PSIxMTIiIHdpZHRoPSIzNiIgaGVpZ2h0PSIzNiIgLz4KICAgICAgICA8YnBtbmRpOkJQTU5MYWJlbD4KICAgICAgICAgIDxkYzpCb3V uZHMgeD0iMTE2IiB5PSI4MiIgd2lkdGg9Ijg4IiBoZWlnaHQ9IjI3IiAvPgogICAgICAgIDwvYnBtbmRpOkJQTU5MYWJlbD4KICAgICAgP C9icG1uZGk6Q1BNT1NoYXB1PgogICAgICA8YnBtbmRpOkJQTU5FZGd1IG1kPSJGbG93XzFycXRpcmxfZGkiIGJwbW5FbGVtZW50PSJGbG9 3XzFycXRpcmwiPgogICAgICAgIDxkaTp3YX1wb2ludCB4PSI00DAiIHk9IjEzMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNTQwI iB5PSIxMzAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIG1kPSJGbG93XzFqMWc3ZGhfZGk iIGJwbW5FbGVtZW50PSJGbG93XzFqMWc3ZGgiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxNzgiIHk9IjEzMCIgLz4KICAgICAgICA8Z Gk6d2F5cG9pbnQgeD0iMjMwIiB5PSIxMzAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGl kPSJGbG93XzAwNzIxaDhfZGkiIGJwbW5FbGVtZW50PSJGbG93XzAwNzIxaDgiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI2NDAiIHk9I jEzMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iNzAwIiB5PSIxMzAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGdlPgogICAgICA 8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzBlYXIwODdfZGkiIGJwbW5FbGVtZW50PSJGbG93XzBlYXIwODciPgogICAgICAgIDxkaTp3Y Xlwb2ludCB4PSI4MDAiIHk9IjEzMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0i0DUwIiB5PSIxMzAiIC8+CiAgICAgIDwvYnBtbmR pOkJQTU5FZGdlPgogICAgICA8YnBtbmRpOkJQTU5FZGdlIGlkPSJGbG93XzFjc2Iwb2xfZGkiIGJwbW5FbGVtZW50PSJGbG93XzFjc2Iwb 2wiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSI5NTAiIHk9IjEzMCIgLz4KICAgICAgICA8ZGk6d2F5cG9pbnQgeD0iOTkwIiB5PSIxMzA iIC8+CiAgICAgIDwvYnBtbmRp0kJQTU5FZGdlPgogICAgICA8YnBtbmRp0kJQTU5FZGdlIGlkPSJGbG93XzFjZThxdWxfZGkiIGJwbW5Fb





GVtZW50PSJGbG93XzFjZThxdWwiPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxMDkwIiB5PSIxMzAiIC8+CiAgICAgICAgPGRpOndheXB vaW50IHg9IjExMzAiIHk9IjEzMCIgLz4KICAgICAgPC9icG1uZGk6QlBNTkVkZ2U+CiAgICAgIDxicG1uZGk6QlBNTkVkZ2UgaWQ9IkZsb 3dfMGgwc3RuYiJkaSIgYnBtbkVsZW1lbnQ9IkZsb3dfMGgwc3RuYiI+ciAgICAgICAgPGRpOndheXBvaW50IHg9IjEyMzAiIHk9IjEzMCI gLz4KICAgICAgICASZGk6d2F5cG9pbnQgeD0iMTI4MCIgeT0iMTMwIiAvPgogICAgICA8L2JwbW5kaTpCUE10RWRnZT4KICAgICAgPGJwbW5kaTpCUE10RWRnZSBpZD0iRmxvd18wdmlqQHpnAZRpIiBicG1uRWxlDbW1udD0iRmxvd18wdmlqQHpnIj4KICAgICAgICAgICAgICAgICAgPGJwbD6p0iMTM4MCIgeT0iMTMwIiAvPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIxNDMyIiB5PSIxMzAiIC8+CiAgICAgIDwvYnBtbmRpOkJQTU5FZGd1lGlkPSJGbG93XzBnbDFucW9fZGkiIGJwbW5FbGVtZW50PSJGbG93XzBnbDFucW8iPgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIZMZAiICAgICAgIDwYYnBtbmRpOkJQTU5FZGd1PgogICAgICAgIDxkaTp3YXlwb2ludCB4PSIZMZAiIHk9IjEzMCIgLz4KICAgICAgICABZGk6d2F5cG9pbnQgeD0iMzgwIiB5PSIXMzAiIC8+CiAgICAgIDwyYnBtbmRpOkJQTU5FZGd1PgogICAgPC9icG1uZGk6QIBNT1BSYW51PgogIDwvYnBtbmRpOkJQTU5EaWFncmFtPgo8L2JwbW46ZGVmaW5pdGlvbnM+Cg==",

```
"playbook_abstraction": "template",
  "playbook_creation_time": "2022-03-31T13:00:00.000Z",
  "playbook_modification_time": "2022-03-31T13:00:00.000Z",
  "revoked": false,
  "playbook_creator": "identity--b085a68a-bf48-4316-9667-37af78cba894",
  "extensions": {
    extension-definition--809C4D84-7A6E-4039-97B4-DA9FEA03FCF9": =
      "extension_type": "new-sdo"
    }
 }
},
  "type": "course-of-action",
  "spec_version": "2.1",
 "id": "course-of-action--4E202C5A-C1DF-42D8-9AEF-809A8E172AE3",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "name": "Quarantine and remediate",
  "description": "Remediate by quarantining and performing analyst guided steps",
  "extensions": {
     extension-definition--BBC1D5C8-7DDC-4E89-BE9C-F33AD02D71DD": {
      "extension_type": "property-extension",
      "playbooks": {
        "CACAO": "x-oca-playbook--9880DF48-09A7-4E99-8070-0DB8F4C946D0",
        "BPMN": "x-oca-playbook--32F52089-9943-4231-BBA3-5C02BA654755"
    }
 }
},
  "type": "relationship",
  "spec_version": "2.1"
 "id": "relationship--282D26EF-0FA0-4975-81FC-69B5946F47D2",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "related-to",
  "source_ref": "x-oca-playbook--9880DF48-09A7-4E99-8070-0DB8F4C946D0",
  "target_ref": "course-of-action--4E202C5A-C1DF-42D8-9AEF-809A8E172AE3"
},
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--84606E92-B52C-4BCA-908C-7D01C498F90C",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "related-to",
  "source_ref": "x-oca-playbook--32F52089-9943-4231-BBA3-5C02BA654755",
  "target_ref": "course-of-action--4E202C5A-C1DF-42D8-9AEF-809A8E172AE3"
},
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--D4B7D30C-1326-4C3E-943D-883498DDCC8F",
  "created": "2022-03-31T13:00:00.000Z"
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "related-to",
  "source_ref": "course-of-action--4E202C5A-C1DF-42D8-9AEF-809A8E172AE3",
  "target_ref": "x-oca-detection-group--58834c29-4ceb-42a1-a218-321103021999"
```





```
"type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--98CC25CE-EBDA-4BC2-9D0C-57173B321198",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "related-to",
      "source_ref": "course-of-action--94D890AC-3E24-4DEC-8ACB-C603FA4A7B20",
      "target ref": "x-oca-detection-group--58834c29-4ceb-42a1-a218-321103021999"
      "type": "extension-definition",
      "spec_version": "2.1",
"id": "extension-definition--809C4D84-7A6E-4039-97B4-DA9FEA03FCF9",
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "name": "x-oca-playbook Extension Definition",
      "description": "This schema creates a new object type called x-oca-playbook.",
      "schema": "https://raw.githubusercontent.com/opencybersecurityalliance/oca-
iob/main/apl_reference_implementation_bundle/revision_2/schemas/sdos/playbook.json",
      "version": "1.0.0",
       "extension_types": [
         "new-sdo"
      ]
    },
      "type": "extension-definition",
      "spec_version": "2.1",
      "id": "extension-definition--BBC1D5C8-7DDC-4E89-BE9C-F33AD02D71DD",
      "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894", "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z",
      "name": "x-oca-coa-playbook Extension Definition",
      "description": "This schema extends the Course of Action SDO with playbook information.",
      "schema": "https://raw.githubusercontent.com/opencybersecurityalliance/oca-
iob/main/apl_reference_implementation_bundle/revision_2/schemas/sdos/course-of-action.json",
      "version": "1.0.0",
      "extension_types": [
         "property-extension"
    },
      "type": "observed-data",
      "spec_version": "2.1",
      "id": "observed-data--3a418c06-bf5d-48b7-9e91-84bff7e0846a",
      "created": "2022-03-31T13:00:00.000Z",
      "modified": "2022-03-31T13:00:00.000Z"
      "first_observed": "2022-03-31T13:00:00.000Z", "last_observed": "2022-03-31T13:00:00.000Z",
      "number_observed": 1,
      "object_refs": [
         "ipv4-addr--57a33521-9761-54a9-81de-3c11e441d86b",
         "ipv4-addr--bba1d187-08fb-5000-aed1-ef055c1dfd24"
        "network-traffic--15a157a8-26e3-56e0-820b-0c2a8e553a2c"
      ]
    },
      "type": "relationship",
      "spec version": "2.1",
      "id": "relationship--2d967554-6995-4bfe-bb6e-d1efeb990570",
      "created": "2022-03-31T13:00:00.000Z",
"modified": "2022-03-31T13:00:00.000Z",
      "relationship_type": "related-to",
      "source_ref": "observed-data--3a418c06-bf5d-48b7-9e91-84bff7e0846a",
      "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890bb"
    },
```





```
"type": "observed-data",
  "spec_version": "2.1",
  "id": "observed-data--4a551d1b-8c08-46bb-b1b8-79b4caa638e2",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z'
  "first_observed": "2022-03-31T13:00:00.000Z",
  "last observed": "2022-03-31T13:00:00.000Z",
  "number_observed": 1,
  "object refs": [
    "process--3BCFB0A5-BAF5-411D-B9D0-8D4B4E09BA82"
},
  "type": "relationship",
  "spec_version": "2.1"
  "id": "relationship--c901c890-c96c-46ca-bf5e-6eca1352ccbc",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "related-to",
  "source ref": "observed-data--4a551d1b-8c08-46bb-b1b8-79b4caa638e2",
  "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890dd"
},
  "type": "observed-data",
  "spec_version": "2.1",
  "id": "observed-data--0e28ca31-6b10-4156-9678-4121b0c09a43",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z"
  "first_observed": "2022-03-31T13:00:00.000Z", "last_observed": "2022-03-31T13:00:00.000Z",
  "number_observed": 1,
  "object_refs": [
    "network-traffic--acffdf9a-bafd-5b74-a7d9-1a6d5a4e9c5a",
    "ipv4-addr--57a33521-9761-54a9-81de-3c11e441d86b",
    "ipv4-addr--429ddae0-a1ff-543d-99b4-f12a4a144c70"
 ]
},
  "type": "relationship",
  "spec version": "2.1"
  "id": "relationship--f2fec843-0fef-44e9-a799-930495a55479",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "related-to",
  "source_ref": "observed-data--0e28ca31-6b10-4156-9678-4121b0c09a43"
  "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ee"
},
  "type": "observed-data",
  "spec_version": "2.1",
  "id": "observed-data--08bd537f-69d9-44e0-90c9-13dc784c4eef",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "first_observed": "2022-03-31T13:00:00.000Z", "last_observed": "2022-03-31T13:00:00.000Z",
  "number_observed": 1,
  "object_refs": [
    "ipv4-addr--57a33521-9761-54a9-81de-3c11e441d86b"
    "network-traffic--3564fb7d-d65c-5e02-9f55-a8a960f5c9f5",
    "domain-name--8713b93b-186e-524d-9224-db3b8f9fb9ef"
 ]
},
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--6befc841-7b3b-4680-b7d6-7c743327d150",
  "created": "2022-03-31T13:00:00.000Z",
```





```
"modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "related-to",
  "source_ref": "observed-data--08bd537f-69d9-44e0-90c9-13dc784c4eef",
  "target ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ff"
  "type": "observed-data",
  "spec version": "2.1",
  "id": "observed-data--f8dc1a7e-33ec-4dc1-8076-739bdcc7358b",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z"
  "first_observed": "2022-03-31T13:00:00.000Z",
  "last_observed": "2022-03-31T13:00:00.000Z",
  "number_observed": 1,
  "object_refs": [
    "network-traffic--fcff628d-d69f-5d23-88b0-aeedcfb7da7c",
    "ipv4-addr--3d4ee4f2-a895-5781-a0cc-b5ba466f053d",
    "ipv4-addr--57a33521-9761-54a9-81de-3c11e441d86b"
 ]
},
  "type": "relationship",
  "spec_version": "2.1"
  "id": "relationship--175473ba-1bf9-4168-a339-65454db013b2",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "related-to",
  "source_ref": "observed-data--f8dc1a7e-33ec-4dc1-8076-739bdcc7358b"
  "target_ref": "x-oca-behavior--DE81EF18-55E6-4754-A761-6B929BF22395"
},
  "type": "observed-data",
  "spec_version": "2.1",
  "id": "observed-data--1419d15e-65e8-4707-9311-25a8b571e7de",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z"
 "number_observed": 1,
  "object_refs": [
    "windows-registry-key--c5a4244e-22d5-5797-8f78-c5fc3d1c0bde"
},
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--0e0da782-5c16-485c-ab7d-1447d1851342",
 "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "related-to",
  "source_ref": "observed-data--1419d15e-65e8-4707-9311-25a8b571e7de"
  "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890cc"
},
  "type": "observed-data",
  "spec_version": "2.1",
  "id": "observed-data--7646a2bc-514c-4599-ae87-ddb8afa89a51",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z"
  "first_observed": "2022-03-31T13:00:00.000Z",
  "last observed": "2022-03-31T13:00:00.000Z",
  "number_observed": 1,
  "object_refs": [
    "process--862e625d-48bb-489e-8d4e-f7d8cd2fcaaa",
    "process--862e625d-48bb-489e-8d4e-f7d8cd2fcbbb"
 ]
},
```





```
"type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--e55308a4-db4e-4a00-a136-a0ccd26178ff",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "related-to",
  "source_ref": "observed-data--7646a2bc-514c-4599-ae87-ddb8afa89a51",
  "target ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ab"
  "type": "observed-data",
  "spec_version": "2.1",
  "id": "observed-data--1a0ce5cc-0115-4108-b30b-8919efa2925c",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.0002
  "first_observed": "2022-03-31T13:00:00.000Z",
  "last_observed": "2022-03-31T13:00:00.000Z",
  "number_observed": 1,
  "object_refs": [
    "process--862e625d-48bb-489e-8d4e-f7d8cd2fcccc",
    "process--862e625d-48bb-489e-8d4e-f7d8cd2fcddd"
},
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--22083b73-9546-41fd-a150-beb3e062766e",
  "created": "2022-03-31T13:00:00.000Z"
  "modified": "2022-03-31T13:00:00.000Z",
 "relationship_type": "related-to",
  "source_ref": "observed-data--1a0ce5cc-0115-4108-b30b-8919efa2925c",
  "target_ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890bc"
},
  "type": "observed-data",
  "spec_version": "2.1",
  "id": "observed-data--12d2cf2b-5f87-4efc-b8cd-c70d719e351a",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "first_observed": "2022-03-31T13:00:00.000Z", "last_observed": "2022-03-31T13:00:00.000Z",
  "number_observed": 1,
  "object refs": [
    "process--862e625d-48bb-489e-8d4e-f7d8cd2fcddd"
 1
},
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--117e35be-a2ba-4b8f-b0ed-cbd22b14940e",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z",
  "relationship_type": "related-to",
  "source_ref": "observed-data--12d2cf2b-5f87-4efc-b8cd-c70d719e351a",
  "target ref": "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890aa"
},
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--ac03ff3c-a51c-4637-bbd9-0f59900a1872",
  "created": "2023-05-15T13:00:00.000Z",
  "modified": "2023-05-15T13:00:00.000Z",
  "relationship_type": "uses",
  "source_ref": "x-oca-detection--5899C5CC-CE20-44EE-806E-9F64EBA0B29F",
  "target ref": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e"
},
  "type": "relationship",
```





```
"spec_version": "2.1",
  "id": "relationship--4ca132b3-f40d-4e38-9d32-a5dc8e91efb0",
 "created": "2023-05-15T13:00:00.000Z",
  "modified": "2023-05-15T13:00:00.000Z"
  "relationship_type": "uses",
  "source_ref": "x-oca-detection--5899C5CC-CE20-44EE-806E-9F64EBA0B29F",
  "target_ref": "x-oca-detector--9441073d-119b-4ec9-aa08-8bdb1703ed56"
},
{
  "type": "relationship",
  "spec_version": "2.1",
 "id": "relationship--3089c0c1-2a6b-4ab0-b274-25d375362892",
 "created": "2023-05-15T13:00:00.000Z",
  "modified": "2023-05-15T13:00:00.000Z",
  "relationship_type": "uses",
  "source_ref": "x-oca-detection--58834c29-4ceb-42a1-a218-336103021111",
  "target ref": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e"
  "type": "relationship",
 "spec_version": "2.1",
  "id": "relationship--958b9180-7270-493f-942e-33d0798572f7",
  "created": "2023-05-15T13:00:00.000Z", "modified": "2023-05-15T13:00:00.000Z"
  "relationship_type": "uses",
  "source_ref": "x-oca-detection--58834c29-4ceb-42a1-a218-336103021222",
  "target_ref": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e"
},
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--cab1e466-64c3-4752-bbce-134bae74b43f",
  "created": "2023-05-15T13:00:00.000Z"
  "modified": "2023-05-15T13:00:00.000Z",
  "relationship_type": "uses",
  "source_ref": "x-oca-detection--58834c29-4ceb-42a1-a218-336103021000",
  "target_ref": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e"
},
  "type": "relationship",
  "spec version": "2.1"
  "id": "relationship--f5e74b96-093f-4942-a8c3-a05ee36023ec",
  "created": "2023-05-15T13:00:00.000Z",
  "modified": "2023-05-15T13:00:00.000Z",
  "relationship_type": "uses",
  "source_ref": "x-oca-detection--458c02c9-3635-42e4-8873-6785e00517e7",
 "target_ref": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e"
},
  "type": "relationship",
  "spec_version": "2.1"
 "id": "relationship--37777af9-db8b-46ca-b1d5-3abc5724d8f2",
  "created": "2023-05-15T13:00:00.000Z",
  "modified": "2023-05-15T13:00:00.000Z",
  "relationship_type": "uses",
  "source_ref": "x-oca-detection--f27cb358-d747-47ba-a6c4-e5b8debab157",
  "target_ref": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e"
},
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--c7eac063-5707-406b-ad43-2a83e5344d61",
  "created": "2023-05-15T13:00:00.000Z",
"modified": "2023-05-15T13:00:00.000Z",
  "relationship_type": "uses",
  "source_ref": "x-oca-detection--275bf485-736d-4aa5-b172-e34d28faa58c",
  "target_ref": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e"
},
```





```
"type": "relationship",
 "spec_version": "2.1",
  "id": "relationship--23ffdaa4-8be9-4eb3-b251-e82e605e2795",
  "created": "2023-05-15T13:00:00.000Z",
"modified": "2023-05-15T13:00:00.000Z"
  "relationship_type": "uses",
 "source ref": "x-oca-detection--275bf485-736d-4aa5-b172-e34d28faa58c",
  "target_ref": "x-oca-detector--67330653-ac02-46c8-b9c2-25b837a2ed6d"
},
  "type": "relationship",
  "spec_version": "2.1",
  "id": "relationship--f2c14bce-581c-4b1d-9ea6-941c2e4a4880",
  "created": "2023-05-15T13:00:00.000Z",
  "modified": "2023-05-15T13:00:00.000Z",
  "relationship_type": "uses",
  "source_ref": "x-oca-detection--40a941cc-42df-4b2e-b607-6d74168084b9",
  "target_ref": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e"
},
  "type": "relationship",
  "spec_version": "2.1"
  "id": "relationship--63b586d2-9d36-48f2-a8f3-36350abe66b6",
  "created": "2023-05-15T13:00:00.000Z",
  "modified": "2023-05-15T13:00:00.000Z",
  "relationship_type": "uses",
  "source_ref": "x-oca-detection--66aa9c25-8b56-4121-8630-dbe457393b27",
 "target_ref": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e"
},
  "type": "relationship",
  "spec_version": "2.1",
 "id": "relationship--12fc0865-9f15-4e79-858a-1ac25ba2ff1f",
  "created": "2023-05-15T13:00:00.000Z",
  "modified": "2023-05-15T13:00:00.000Z",
  "relationship_type": "uses",
  "source_ref": "x-oca-detection--66aa9c25-8b56-4121-8630-dbe457393b27",
  "target_ref": "x-oca-detector--67330653-ac02-46c8-b9c2-25b837a2ed6d"
},
  "x_mitre_platforms": [
    ____
"Windows"
  "x mitre domains": [
    "enterprise-attack",
    "ics-attack"
  'x_mitre_collection_layers": [
    "Host"
  "object_marking_refs": [
    "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
  ],
"id": "x-mitre-data-source--0f42a24c-e035-4f93-a91c-5f7076bd8da0",
"
  "type": "x-mitre-data-source",
  "created": "2021-10-20T15:05:19.273Z",
  "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
  "external_references": [
    {
      "source_name": "mitre-attack",
      "url": "https://attack.mitre.org/datasources/DS0024",
      "external_id": "DS0024"
    },
      "source_name": "Microsoft Registry",
      "description": "Microsoft. (2018, May 31). Registry. Retrieved September 29, 2021.",
      "url": "https://docs.microsoft.com/en-us/windows/win32/sysinfo/registry'
```





```
}
      "modified": "2022-05-11T14:00:00.188Z",
      "name": "Windows Registry",
      "description": "A Windows OS hierarchical database that stores much of the information and settings
for software programs, hardware devices, user preferences, and operating-system configurations(Citation:
Microsoft Registry)",
      "x mitre version": "1.0",
      "x_mitre_attack_spec_version": "2.1.0",
      "x_mitre_modified_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "spec_version": "2.1
    },
      "type": "relationship",
      "spec_version": "2.1",
     "id": "relationship--417693ec-1543-48a4-be84-a238bf8dfb8d",
     "created": "2023-05-15T13:00:00.000Z",
      "modified": "2023-05-15T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e",
      "target_ref": "x-mitre-data-source--0f42a24c-e035-4f93-a91c-5f7076bd8da0"
    },
      "object_marking_refs": [
        "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      "id": "x-mitre-data-component--da85d358-741a-410d-9433-20d6269a6170",
      "type": "x-mitre-data-component",
      "created": "2021-10-20T15:05:19.273Z",
      "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "modified": "2022-04-25T14:00:00.188Z",
      "name": "Windows Registry Key Modification",
     "description": "Changes made to a Registry Key and/or Key value (ex: Windows EID 4657 or Sysmon EID
13 | 14)",
      "x_mitre_version": "1.0",
      "x_mitre_attack_spec_version": "2.1.0",
      "x_mitre_modified_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
     "spec_version": "2.1",
      "x_mitre_domains": [
        "enterprise-attack"
   },
      "type": "relationship",
      "spec_version": "2.1",
     "id": "relationship--8a7f7654-5346-4897-b102-df81246af61e",
     "created": "2023-05-15T13:00:00.000Z",
      "modified": "2023-05-15T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e",
      "target_ref": "x-mitre-data-component--da85d358-741a-410d-9433-20d6269a6170"
    },
      "modified": "2023-04-20T18:38:26.515Z",
      "name": "Process",
      "description": "Instances of computer programs that are being executed by at least one thread.
Processes have memory space for process executables, loaded modules (DLLs or shared libraries), and
allocated memory regions containing everything from user input to application-specific data
structures(Citation: Microsoft Processes and Threads)",
      "x_mitre_platforms": [
        "Linux",
        "Windows",
        "macOS"
        "Android",
        "i0S"
      "x_mitre_deprecated": false,
```





```
"x mitre domains": [
         "enterprise-attack",
        "mobile-attack"
      ],
      "x_mitre_version": "1.1",
      "x_mitre_contributors": [
        "Center for Threat-Informed Defense (CTID)"
      "x_mitre_collection_layers": [
        "Host"
      "type": "x-mitre-data-source",
      "id": "x-mitre-data-source--e8b8ede7-337b-4c0c-8c32-5c7872c1ee22",
      "created": "2021-10-20T15:05:19.272Z",
      "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "revoked": false,
      "external_references": [
          "source_name": "mitre-attack",
"url": "https://attack.mitre.org/datasources/DS0009",
          "external_id": "DS0009"
        },
          "source_name": "Microsoft Processes and Threads",
          "description": "Microsoft. (2018, May 31). Processes and Threads. Retrieved September 28,
2021.",
          "url": "https://docs.microsoft.com/en-us/windows/win32/procthread/processes-and-threads"
        }
      "object_marking_refs": [
        "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      "x_mitre_attack_spec_version": "3.1.0",
      "x mitre modified by ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "spec_version": "2.1"
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--d811f064-2df1-46d3-954c-4011e74425da",
      "created": "2023-05-15T13:00:00.000Z",
"modified": "2023-05-15T13:00:00.000Z"
      "relationship_type": "uses",
      "source_ref": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e",
      "target ref": "x-mitre-data-source--e8b8ede7-337b-4c0c-8c32-5c7872c1ee22"
    },
      "modified": "2022-10-07T16:15:56.932Z",
      "name": "Process Creation",
      "description": "The initial construction of an executable managed by the OS, that may involve one or
more tasks or threads. (e.g. Win EID 4688, Sysmon EID 1, cmd.exe > net use, etc.)'
      "x_mitre_data_source_ref": "x-mitre-data-source--e8b8ede7-337b-4c0c-8c32-5c7872c1ee22",
      "x_mitre_deprecated": false,
      "x_mitre_version": "1.1",
      "type": "x-mitre-data-component",
      "id": "x-mitre-data-component--3d20385b-24ef-40e1-9f56-f39750379077",
      "created": "2021-10-20T15:05:19.272Z",
      "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "revoked": false,
      "object_marking_refs": [
        "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      "x_mitre_attack_spec_version": "2.1.0",
      "x_mitre_modified_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "spec_version": "2.1",
      "x_mitre_domains": [
        "enterprise-attack"
      ]
```





```
},
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--913ea5e0-0ec0-4885-b241-6f53526a98e5",
      "created": "2023-05-15T13:00:00.000Z",
      "modified": "2023-05-15T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e",
      "target ref": "x-mitre-data-component--3d20385b-24ef-40e1-9f56-f39750379077"
    },
      "x_mitre_platforms": [
        "Linux",
        "Windows",
        "macOS"
      "x_mitre_domains": [
        "enterprise-attack"
      "x_mitre_contributors": [
"Center for Threat-Informed Defense (CTID)"
       "x_mitre_collection_layers": [
        "Host"
      "object_marking_refs": [
        "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      "id": "x-mitre-data-source--ba27545a-9c32-47ea-ba6a-cce50f1b326e",
      "type": "x-mitre-data-source",
      "created": "2021-10-20T15:05:19.274Z",
      "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "external_references": [
        {
          "source_name": "mitre-attack",
          "url": "https://attack.mitre.org/datasources/DS0033",
          "external_id": "DS0033"
        },
          "source_name": "Microsoft NFS Overview";
          "description": "Microsoft. (2018, July 9). Network File System overview. Retrieved September 28,
2021.",
          "url": "https://docs.microsoft.com/en-us/windows-server/storage/nfs/nfs-overview"
        }
      "modified": "2022-03-30T14:26:51.806Z",
      "name": "Network Share",
      "description": "A storage resource (typically a folder or drive) made available from one host to
others using network protocols, such as Server Message Block (SMB) or Network File System (NFS)(Citation:
Microsoft NFS Overview)",
      "x_mitre_version": "1.0",
      "x_mitre_attack_spec_version": "2.1.0",
      "x_mitre_modified_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "spec_version": "2.1
    },
      "type": "relationship",
      "spec_version": "2.1"
      "id": "relationship--8c9b87b9-4b26-4235-b992-6a6b87a1a91a",
      "created": "2023-05-15T13:00:00.000Z",
      "modified": "2023-05-15T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e",
      "target ref": "x-mitre-data-source--ba27545a-9c32-47ea-ba6a-cce50f1b326e"
    },
      "object_marking_refs": [
```





```
"marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      "id": "x-mitre-data-component--f5468e67-51c7-4756-9b4f-65707708e7fa",
      "type": "x-mitre-data-component",
      "created": "2021-10-20T15:05:19.275Z",
      "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "modified": "2022-04-25T14:00:00.188Z",
      "name": "Network Share Access",
      "description": "Opening a network share, which makes the contents available to the requestor (ex:
Windows EID 5140 or 5145)",
      "x_mitre_data_source_ref": "x-mitre-data-source--ba27545a-9c32-47ea-ba6a-cce50f1b326e",
      "x_mitre_version": "1.0",
      "x_mitre_attack_spec_version": "2.1.0",
      "x mitre modified by ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "spec_version": "2.1",
      "x_mitre_domains": [
        "enterprise-attack"
      ]
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--cc07695b-ddbe-4c76-b41a-5eae1e78bb2a",
      "created": "2023-05-15T13:00:00.000Z"
      "modified": "2023-05-15T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e"
      "target_ref": "x-mitre-data-component--f5468e67-51c7-4756-9b4f-65707708e7fa"
    },
    {
      "modified": "2023-04-20T18:38:13.356Z",
      "name": "Network Traffic",
      "description": "Data transmitted across a network (ex: Web, DNS, Mail, File, etc.), that is either
summarized (ex: Netflow) and/or captured as raw data in an analyzable format (ex: PCAP)",
      "x_mitre_platforms": [
        "IaaS",
"Linux",
        "Windows",
        "macOS"
        "Android",
        "i0S"
      "x_mitre_deprecated": false,
      "x_mitre_domains": [
        "enterprise-attack",
        "mobile-attack"
      "x_mitre_version": "1.1",
      "x_mitre_contributors": [
        "Center for Threat-Informed Defense (CTID)",
        "ExtraHop"
      "x_mitre_collection_layers": [
        "Cloud Control Plane",
        "Host",
        "Network"
      "type": "x-mitre-data-source",
      "id": "x-mitre-data-source--c000cd5c-bbb3-4606-af6f-6c6d9de0bbe3",
      "created": "2021-10-20T15:05:19.274Z",
      "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "revoked": false,
      "external_references": [
          "source_name": "mitre-attack",
          "url": "https://attack.mitre.org/datasources/DS0029",
          "external_id": "DS0029"
        }
```





```
"object_marking_refs": [
        "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      "x_mitre_attack_spec_version": "3.1.0",
      "x_mitre_modified_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "spec_version": "2.1"
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--7b86d9f4-a599-4434-8b7a-170d50ec1662",
      "created": "2023-05-15T13:00:00.000Z",
      "modified": "2023-05-15T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "x-oca-detector--9441073d-119b-4ec9-aa08-8bdb1703ed56",
      "target ref": "x-mitre-data-source--c000cd5c-bbb3-4606-af6f-6c6d9de0bbe3"
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--df076a56-f728-48b0-ac85-cbfa55d62dbe",
      "created": "2023-05-15T13:00:00.000Z", "modified": "2023-05-15T13:00:00.000Z"
      "relationship_type": "uses",
      "source_ref": "x-oca-detector--67330653-ac02-46c8-b9c2-25b837a2ed6d",
      "target_ref": "x-mitre-data-source--c000cd5c-bbb3-4606-af6f-6c6d9de0bbe3"
    },
      "modified": "2022-10-20T20:18:06.745Z",
      "name": "Network Connection Creation",
      "description": "Initial construction of a network connection, such as capturing socket information
with a source/destination IP and port(s) (ex: Windows EID 5156, Sysmon EID 3, or Zeek conn.log)",
      "x_mitre_data_source_ref": "x-mitre-data-source--c000cd5c-bbb3-4606-af6f-6c6d9de0bbe3",
      "x_mitre_deprecated": false,
      "x_mitre_version": "1.1",
      "type": "x-mitre-data-component",
      "id": "x-mitre-data-component--181a9f8c-c780-4f1f-91a8-edb770e904ba",
      "created": "2021-10-20T15:05:19.274Z",
      "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "revoked": false,
      "object_marking_refs": [
        "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      "x mitre attack spec version": "2.1.0",
      "x_mitre_modified_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "spec_version": "2.1",
      "x_mitre_domains": [
        ____
"enterprise-attack"
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--a3d7b535-fe76-47b2-ac2b-a620e65fe04f",
      "created": "2023-05-15T13:00:00.000Z",
      "modified": "2023-05-15T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "x-oca-detector--9441073d-119b-4ec9-aa08-8bdb1703ed56",
      "target_ref": "x-mitre-data-component--181a9f8c-c780-4f1f-91a8-edb770e904ba"
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--4a7a74a4-9f4b-4e33-9e61-f052ca3ea48a",
      "created": "2023-05-15T13:00:00.000Z",
      "modified": "2023-05-15T13:00:00.000Z"
      "relationship_type": "uses",
```





```
"source ref": "x-oca-detector--67330653-ac02-46c8-b9c2-25b837a2ed6d"
      "target_ref": "x-mitre-data-component--181a9f8c-c780-4f1f-91a8-edb770e904ba"
    },
    {
      "object_marking_refs": [
        "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      "id": "x-mitre-data-component--3772e279-27d6-477a-9fe3-c6beb363594c",
      "type": "x-mitre-data-component",
      "created": "2021-10-20T15:05:19.274Z",
      "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "modified": "2022-04-25T14:00:00.188Z",
      "name": "Network Traffic Content",
      "description": "Logged network traffic data showing both protocol header and body values (ex:
PCAP)",

"x_mitre_data_source_ref": "x-mitre-data-source--c000cd5c-bbb3-4606-af6f-6c6d9de0bbe3",
      "x_mitre_version": "1.0",
      "x_mitre_attack_spec_version": "2.1.0",
      "x_mitre_modified_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "spec_version": "2.1",
      "x_mitre_domains": [
        "enterprise-attack"
    },
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--05461c91-0a8b-4eac-b134-21ba631c10d0",
      "created": "2023-05-15T13:00:00.000Z",
      "modified": "2023-05-15T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "x-oca-detector--9441073d-119b-4ec9-aa08-8bdb1703ed56",
      "target_ref": "x-mitre-data-component--3772e279-27d6-477a-9fe3-c6beb363594c"
      "type": "relationship",
      "spec_version": "2.1",
      "id": "relationship--4bac4ea6-4826-40da-8a5c-d89b7e2f54cc",
      "created": "2023-05-15T13:00:00.000Z",
      "modified": "2023-05-15T13:00:00.000Z",
      "relationship_type": "uses",
      "source_ref": "x-oca-detector--67330653-ac02-46c8-b9c2-25b837a2ed6d",
      "target ref": "x-mitre-data-component--3772e279-27d6-477a-9fe3-c6beb363594c"
    },
      "object_marking_refs": [
        "marking-definition--fa42a846-8d90-4e51-bc29-71d5b4802168"
      "id": "x-mitre-data-component--a7f22107-02e5-4982-9067-6625d4a1765a",
      "type": "x-mitre-data-component",
      "created": "2021-10-20T15:05:19.274Z"
      "created_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "modified": "2022-04-25T14:00:00.188Z",
      "name": "Network Traffic Flow",
      "description": "Summarized network packet data, with metrics, such as protocol headers and volume
(ex: Netflow or Zeek http.log)",
      "x_mitre_data_source_ref": "x-mitre-data-source--c000cd5c-bbb3-4606-af6f-6c6d9de0bbe3",
      "x_mitre_version": "1.0",
      "x_mitre_attack_spec_version": "2.1.0",
      "x_mitre_modified_by_ref": "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5",
      "spec_version": "2.1",
      "x_mitre_domains": [
        "enterprise-attack"
      ]
    },
      "type": "relationship",
      "spec_version": "2.1",
```





```
"id": "relationship--4c0dc183-3372-4e99-be15-e7e46682bede",
  "created": "2023-05-15T13:00:00.000Z"
  "modified": "2023-05-15T13:00:00.000Z",
  "relationship_type": "uses",
  "source_ref": "x-oca-detector--9441073d-119b-4ec9-aa08-8bdb1703ed56",
  "target_ref": "x-mitre-data-component--a7f22107-02e5-4982-9067-6625d4a1765a"
  "type": "relationship",
  "spec version": "2.1"
  "id": "relationship--d44f3f49-071a-455e-9da6-bd7fb521897f",
 "created": "2023-05-15T13:00:00.000Z",
  "modified": "2023-05-15T13:00:00.000Z",
  "relationship_type": "uses",
  "source_ref": "x-oca-detector--67330653-ac02-46c8-b9c2-25b837a2ed6d",
  "target_ref": "x-mitre-data-component--a7f22107-02e5-4982-9067-6625d4a1765a"
},
  "type": "grouping",
  "spec_version": "2.1"
  "id": "grouping--35058fc1-2126-41c3-b1fc-e2ebc39f50c2",
  "created_by_ref": "identity--b085a68a-bf48-4316-9667-37af78cba894",
  "created": "2022-03-31T13:00:00.000Z",
  "modified": "2022-03-31T13:00:00.000Z'
  "name": "Reaper Lite Behavior Information",
  "context": "suspicious-activity",
  "object_refs": [
    "attack-pattern--2b742742-28c3-4e1b-bab7-8350d6300fa7"
    "attack-pattern--7b211ac6-c815-4189-93a9-ab415deca926",
    "attack-pattern--86850eff-2729-40c3-b85e-c4af26da4a2d",
    "attack-pattern--92d7da27-2d91-488e-a00c-059dc162766d",
    "attack-pattern--970a3432-3237-47ad-bcca-7d8cbb217736"
    "attack-pattern--9efb1ea7-c37b-4595-9640-b7680cd84279",
    "attack-pattern--df8b2a25-8bdf-4856-953c-a04372b1c161",
    "attack-pattern--f303a39a-6255-4b89-aecc-18c4d8ca7163",
    "campaign--f3bf3827-d9c5-414d-b0f0-610146ff5d85",
    "course-of-action--4E202C5A-C1DF-42D8-9AEF-809A8E172AE3"
    "course-of-action--94D890AC-3E24-4DEC-8ACB-C603FA4A7B20",
    "domain-name--8713b93b-186e-524d-9224-db3b8f9fb9ef",
    "extension-definition--2cf8c8c2-69f5-40f7-aa34-efcef2b912b1",
    "extension-definition--3b7505ce-2a18-496e-aa58-311dac6c1473"
    "extension-definition--5cccba5c-0be4-450c-8672-b66e98515754",
    "extension-definition--809C4D84-7A6E-4039-97B4-DA9FEA03FCF9",
    "extension-definition--9c59fd79-4215-4ba2-920d-3e4f320e1e62",
    "extension-definition--BBC1D5C8-7DDC-4E89-BE9C-F33AD02D71DD",
    "extension-definition--c4690e13-107e-4796-8158-0dcf1ae7bc89",
    "extension-definition--dbbce349-3550-4cdd-8a7b-af58bc12de6c"
    "extension-definition--f9dbe89c-0030-4a9d-8b78-0dcd0a0de874",
    "identity--b085a68a-bf48-4316-9667-37af78cba894",
    "identity--c78cb6e5-0c4b-4611-8297-d1b8b55e40b5"
    "ipv4-addr--3d4ee4f2-a895-5781-a0cc-b5ba466f053d",
    "ipv4-addr--429ddae0-a1ff-543d-99b4-f12a4a144c70",
    "ipv4-addr--57a33521-9761-54a9-81de-3c11e441d86b",
    "ipv4-addr--bba1d187-08fb-5000-aed1-ef055c1dfd24"
    "network-traffic--15a157a8-26e3-56e0-820b-0c2a8e553a2c"
    "network-traffic--3564fb7d-d65c-5e02-9f55-a8a960f5c9f5",
    "network-traffic--acffdf9a-bafd-5b74-a7d9-1a6d5a4e9c5a",
    "network-traffic--fcff628d-d69f-5d23-88b0-aeedcfb7da7c",
    "observed-data--08bd537f-69d9-44e0-90c9-13dc784c4eef",
    "observed-data--0e28ca31-6b10-4156-9678-4121b0c09a43"
    "observed-data--12d2cf2b-5f87-4efc-b8cd-c70d719e351a",
    "observed-data--1419d15e-65e8-4707-9311-25a8b571e7de",
    "observed-data--1a0ce5cc-0115-4108-b30b-8919efa2925c",
    "observed-data--3a418c06-bf5d-48b7-9e91-84bff7e0846a"
    "observed-data--4a551d1b-8c08-46bb-b1b8-79b4caa638e2",
    "observed-data--7646a2bc-514c-4599-ae87-ddb8afa89a51",
    "observed-data--f8dc1a7e-33ec-4dc1-8076-739bdcc7358b",
    "process--3BCFB0A5-BAF5-411D-B9D0-8D4B4E09BA82",
```





```
"process--862e625d-48bb-489e-8d4e-f7d8cd2fcaaa",
"process--862e625d-48bb-489e-8d4e-f7d8cd2fcbbb",
.
"process--862e625d-48bb-489e-8d4e-f7d8cd2fcccc",
"process--862e625d-48bb-489e-8d4e-f7d8cd2fcddd"
"relationship--0347363b-b476-4bff-8203-a585febf21bb",
"relationship--05461c91-0a8b-4eac-b134-21ba631c10d0"
"relationship--0e0da782-5c16-485c-ab7d-1447d1851342"
"relationship--117e35be-a2ba-4b8f-b0ed-cbd22b14940e",
"relationship--12fc0865-9f15-4e79-858a-1ac25ba2ff1f",
"relationship--175473ba-1bf9-4168-a339-65454db013b2"
"relationship--18568ee3-837f-48d3-b807-a5f64ab3b9d8"
"relationship--19856de6-739c-4b31-b0cc-aaa6b0b751c8",
"relationship--22083b73-9546-41fd-a150-beb3e062766e",
"relationship--23ffdaa4-8be9-4eb3-b251-e82e605e2795"
"relationship--258248c6-6363-461a-9b8b-452d0518b2a9"
"relationship--282D26EF-0FA0-4975-81FC-69B5946F47D2"
"relationship--2d967554-6995-4bfe-bb6e-d1efeb990570",
"relationship--3089c0c1-2a6b-4ab0-b274-25d375362892",
"relationship--33da2e36-637b-47a7-ae95-d8ae192fb3d2"
"relationship--3437bf91-0115-4c05-bfda-d9abf9954f8e"
"relationship--37777af9-db8b-46ca-b1d5-3abc5724d8f2",
"relationship--399ee227-e888-4dcd-bbc8-b79cf5cff259",
"relationship--3ad280cd-42f7-49b6-88ff-d2ee35a175b6"
"relationship--3e3295b7-c616-4ee1-8210-002093589884"
"relationship--417693ec-1543-48a4-be84-a238bf8dfb8d"
"relationship--45dcf923-f8b1-45bf-8788-055a7033d6ee",
"relationship--4655b19d-c949-45be-8316-e8861c634cab",
"relationship--4a7a74a4-9f4b-4e33-9e61-f052ca3ea48a"
"relationship--4bac4ea6-4826-40da-8a5c-d89b7e2f54cc"
"relationship--4c0dc183-3372-4e99-be15-e7e46682bede",
"relationship--4ca132b3-f40d-4e38-9d32-a5dc8e91efb0",
"relationship--535d743b-0b78-4891-a515-8ec92e65d42b",
"relationship--603e1426-49d7-42ea-a73a-263a963e6db0"
"relationship--6317A9AC-6763-4551-B004-CA2AA45B3510",
"relationship--63b586d2-9d36-48f2-a8f3-36350abe66b6",
"relationship--64726807-5082-43C3-B975-1484B60B963B",
"relationship--64726807-5082-43C3-B975-1484B60B963C"
"relationship--64726807-5082-43C3-B975-1484B60B963D"
"relationship--6befc841-7b3b-4680-b7d6-7c743327d150",
"relationship--6d65615b-b7f6-4169-9226-6b70509f8f38",
"relationship--72fc61e3-67d7-497e-900b-faf26173bd71"
"relationship--731021e2-e7a8-4863-ba41-65c893d7c564"
"relationship--7a9afa0a-0c25-4dec-8f3d-db92e213643c",
"relationship--7b86d9f4-a599-4434-8b7a-170d50ec1662",
"relationship--7f91c908-73ea-40e2-91df-ec9d72e37005",
"relationship--81da5956-d9ea-4a09-9e3d-ab09be3cc3eb"
"relationship--84606E92-B52C-4BCA-908C-7D01C498F90C"
"relationship--87c4aca0-6b97-4fe9-ab99-ab5ba7f3db95",
"relationship--88ae0ce8-96d8-4886-a5aa-bbc0a32c3a3f",
"relationship--8a7f7654-5346-4897-b102-df81246af61e"
"relationship--8c9b87b9-4b26-4235-b992-6a6b87a1a91a"
"relationship--8DE4A689-FDA3-45B9-8FE2-4A519884CEA7",
"relationship--8e796cf6-5401-4a23-9354-59b58155bd5e",
"relationship--913ea5e0-0ec0-4885-b241-6f53526a98e5"
"relationship--92C59855-392E-490A-964C-F9E3B3D202BF"
"relationship--94aaccf3-e8c4-41c0-985a-473f46312bb7"
"relationship--958b9180-7270-493f-942e-33d0798572f7",
"relationship--98CC25CE-EBDA-4BC2-9D0C-57173B321198",
"relationship--a3d7b535-fe76-47b2-ac2b-a620e65fe04f"
"relationship--a7e2ab2a-cdf5-45d0-bbe2-e6ecdb95ca99"
"relationship--ac03ff3c-a51c-4637-bbd9-0f59900a1872",
"relationship--ae96d1d8-41ab-4bf1-aad9-6bf704064404",
"relationship--baf7f0f2-1aa8-45cb-b306-cbca8dd863d1",
"relationship--C4CBC936-2936-450F-9E79-CE8E2F795A3D"
"relationship--c4e4b439-2662-47e1-b961-2b6a6fae5241"
"relationship--c7eac063-5707-406b-ad43-2a83e5344d61",
"relationship--c901c890-c96c-46ca-bf5e-6eca1352ccbc",
"relationship--c9a2a2b3-67f3-4b8a-ad40-17c8098f7205"
```





```
"relationship--cab1e466-64c3-4752-bbce-134bae74b43f"
      "relationship--cc07695b-ddbe-4c76-b41a-5eae1e78bb2a",
      "relationship--d3f134d4-bf65-477c-927e-1b0e87630e38",
      "relationship--d44f3f49-071a-455e-9da6-bd7fb521897f"
      "relationship--D4B7D30C-1326-4C3E-943D-883498DDCC8F'
      "relationship--d4ce259f-f595-4d1d-913c-e17454396dba"
      "relationship--d811f064-2df1-46d3-954c-4011e74425da",
      "relationship--d8935337-1917-446c-9c63-ac0a36438712",
      "relationship--d99350ec-bc5b-4d92-8990-ae6b08ffce7a"
      "relationship--d993c3af-9443-44db-9478-b3a9d632d94d"
      "relationship--df076a56-f728-48b0-ac85-cbfa55d62dbe",
      "relationship--e38c15bc-224e-4d81-a899-dc3b6f8cee92",
      "relationship--e55308a4-db4e-4a00-a136-a0ccd26178ff"
      "relationship--e60900fc-e47e-44f3-aac2-4a5ca9be7c78"
      "relationship--e82c60ee-78e1-4056-a2e0-2ed73571605d",
      "relationship--eb6fd1a1-00bb-44c0-bba5-6c3a335c6cb6",
      "relationship--f2c14bce-581c-4b1d-9ea6-941c2e4a4880",
      "relationship--f2fec843-0fef-44e9-a799-930495a55479",
      "relationship--f5e74b96-093f-4942-a8c3-a05ee36023ec"
      "relationship--fd55f673-53b0-4ae1-915b-6f30b20c950b",
      "windows-registry-key--c5a4244e-22d5-5797-8f78-c5fc3d1c0bde",
      "x-mitre-data-component--181a9f8c-c780-4f1f-91a8-edb770e904ba'
      "x-mitre-data-component--3772e279-27d6-477a-9fe3-c6beb363594c"
      "x-mitre-data-component--3d20385b-24ef-40e1-9f56-f39750379077"
      "x-mitre-data-component--a7f22107-02e5-4982-9067-6625d4a1765a",
      "x-mitre-data-component--da85d358-741a-410d-9433-20d6269a6170",
      "x-mitre-data-component--f5468e67-51c7-4756-9b4f-65707708e7fa",
      "x-mitre-data-source--0f42a24c-e035-4f93-a91c-5f7076bd8da0",
      "x-mitre-data-source--ba27545a-9c32-47ea-ba6a-cce50f1b326e",
      "x-mitre-data-source--c000cd5c-bbb3-4606-af6f-6c6d9de0bbe3",
      "x-mitre-data-source--e8b8ede7-337b-4c0c-8c32-5c7872c1ee22",
      "x-oca-behavior--DE81EF18-55E6-4754-A761-6B929BF22395",
      "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890aa",
      "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ab",
      "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890bb",
      "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890bc'
      "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890cc"
      "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890dd",
      "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ee",
      "x-oca-behavior--edc99806-f8e9-4ee3-b2d4-1234567890ff'
      "x-oca-detection--275bf485-736d-4aa5-b172-e34d28faa58c'
      "x-oca-detection--40a941cc-42df-4b2e-b607-6d74168084b9"
      "x-oca-detection--458c02c9-3635-42e4-8873-6785e00517e7"
      "x-oca-detection--58834c29-4ceb-42a1-a218-336103021000"
      "x-oca-detection--58834c29-4ceb-42a1-a218-336103021111"
      "x-oca-detection--58834c29-4ceb-42a1-a218-336103021222"
      "x-oca-detection--5899C5CC-CE20-44EE-806E-9F64EBA0B29F",
      "x-oca-detection--66aa9c25-8b56-4121-8630-dbe457393b27"
      "x-oca-detection--f27cb358-d747-47ba-a6c4-e5b8debab157
      "x-oca-detection-group--58834c29-4ceb-42a1-a218-321103021999",
      "x-oca-detector--67330653-ac02-46c8-b9c2-25b837a2ed6d",
      "x-oca-detector--9441073d-119b-4ec9-aa08-8bdb1703ed56",
      "x-oca-detector--f9ccdd3d-2217-45fd-8e65-055da8e66c3e",
      "x-oca-playbook--32F52089-9943-4231-BBA3-5C02BA654755"
      "x-oca-playbook--720E5E68-3959-4EE0-99DE-87A4EAA39F44",
      "x-oca-playbook--9880DF48-09A7-4E99-8070-0DB8F4C946D0",
      "x-oca-playbook--AE16A784-BAC9-4334-A09F-7CB63053A6D7"
    1
  }
]
```

"relationship--ca57a603-b4d6-475e-be8d-7618fbd58fbb",