

**Avail**  
*Polygon*

**HALBORN**



Prepared by:  **HALBORN**

Last Updated 04/26/2024

Date of Engagement by: May 23rd, 2022 - July 20th, 2022

## Summary

**0%** ⓘ OF ALL REPORTED FINDINGS HAVE BEEN ADDRESSED

<b>ALL FINDINGS</b>	<b>CRITICAL</b>	<b>HIGH</b>	<b>MEDIUM</b>	<b>LOW</b>	<b>INFORMATIONAL</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>

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## **1. INTRODUCTION**

\client engaged **Halborn** to conduct a security audit on their pallets beginning on 2022-05-23 and ending on 2022-07-20. The security assessment was scoped to the pallets provided in the GitHub repository [avail](#). Commit hashes and further details can be found in the Scope section of this report.

## **2. AUDIT SUMMARY**

The team at Halborn was provided 8 weeks for the engagement and assigned 2 full-time security engineers to audit the security of the node in scope. The security engineers are a blockchain and smart-contract security experts with advanced penetration testing and smart-contract hacking skills, and in-depth knowledge of multiple blockchain protocols.

The purpose of this audit is to:

- Identify potential security issues within the code

In summary, Halborn identified some improvements to reduce the likelihood and impact of risks, which should be addressed by \client. Most vulnerabilities found were acknowledged by \client. Since the potential impact is insignificant, some of them will not be fixed currently, which should not affect overall security of the project. The crates update will be executed in the future, the unimplemented RPC issue has been fixed by updating the docs. Two remaining issues will not be fixed or will be fixed in the future, though the exact date is not known at the moment.

### **3. TEST APPROACH & METHODOLOGY**

Halborn performed a combination of manual review of the code and automated security testing to balance efficiency, timeliness, practicality, and accuracy in regard to the scope of the audit. While manual testing is recommended to uncover flaws in logic, process, and implementation; automated testing techniques help enhance coverage of pallets and can quickly identify items that do not follow security best practices.

The following phases and associated tools were used throughout the term of the audit:

- Research into the architecture, purpose, and use of the platform.
- Smart contract manual code review and walkthrough to identify any logic issue.
- Mapping out possible attack vectors
- Thorough assessment of safety and usage of critical Rust variables and functions in scope that could lead to arithmetic vulnerabilities.
- Finding unsafe Rust code usage (`cargo-geiger`)
- On chain testing of core functions(`polkadot.js`).
- Active Fuzz testing of the RPC-API using `ffuf`.
- Test coverage review (`cargo tarpaulin`)
- Scanning dependencies for known vulnerabilities (`cargo audit` and `cargo deny`).

### **4. SCOPE**

**Code repositories:**

1. Substrate Project Name
2. Repository: `avail`
3. Commit ID: `75930dd20fd95553d9802488ba3e0e883b8f7eb1`
4. Code in scope:
  1. da (`pallets/dacdr/`)
  2. frame\_system (`pallets/system/`)
  3. frame\_executive (`pallets/executive/`)
  4. kate (`kate/`)
  5. rpc-api (`rpc-api/`)
5. da (`pallets/dacdr/`)
6. frame\_system (`pallets/system/`)
7. frame\_executive (`pallets/executive/`)
8. kate (`kate/`)
9. rpc-api (`rpc-api/`)

**Out-of-scope:** External libraries and financial related attacks.

## 5. RISK METHODOLOGY

Every vulnerability and issue observed by Halborn is ranked based on **two sets of Metrics** and a **Severity Coefficient**. This system is inspired by the industry standard Common Vulnerability Scoring System.

The two **Metric sets** are: **Exploitability** and **Impact**. **Exploitability** captures the ease and technical means by which vulnerabilities can be exploited and **Impact** describes the consequences of a successful exploit.

The **Severity Coefficients** is designed to further refine the accuracy of the ranking with two factors: **Reversibility** and **Scope**. These capture the impact of the vulnerability on the environment as well as the number of users and smart contracts affected.

The final score is a value between 0-10 rounded up to 1 decimal place and 10 corresponding to the highest security risk. This provides an objective and accurate rating of the severity of security vulnerabilities in smart contracts.

The system is designed to assist in identifying and prioritizing vulnerabilities based on their level of risk to address the most critical issues in a timely manner.

### 5.1 EXPLOITABILITY

#### ATTACK ORIGIN (AO):

Captures whether the attack requires compromising a specific account.

#### ATTACK COST (AC):

Captures the cost of exploiting the vulnerability incurred by the attacker relative to sending a single transaction on the relevant blockchain. Includes but is not limited to financial and computational cost.

#### ATTACK COMPLEXITY (AX):

Describes the conditions beyond the attacker's control that must exist in order to exploit the vulnerability. Includes but is not limited to macro situation, available third-party liquidity and regulatory challenges.

#### METRICS:

EXPLOITABILITY METRIC ( $M_E$ )	METRIC VALUE	NUMERICAL VALUE
Attack Origin (AO)	Arbitrary (AO:A) Specific (AO:S)	1 0.2
Attack Cost (AC)	Low (AC:L) Medium (AC:M) High (AC:H)	1 0.67 0.33

EXPLOITABILITY METRIC ( $M_E$ )	METRIC VALUE	NUMERICAL VALUE
Attack Complexity (AX)	Low (AX:L) Medium (AX:M) High (AX:H)	1 0.67 0.33

Exploitability  $E$  is calculated using the following formula:

$$E = \prod m_e$$

## 5.2 IMPACT

### CONFIDENTIALITY (C):

Measures the impact to the confidentiality of the information resources managed by the contract due to a successfully exploited vulnerability. Confidentiality refers to limiting access to authorized users only.

### INTEGRITY (I):

Measures the impact to integrity of a successfully exploited vulnerability. Integrity refers to the trustworthiness and veracity of data stored and/or processed on-chain. Integrity impact directly affecting Deposit or Yield records is excluded.

### AVAILABILITY (A):

Measures the impact to the availability of the impacted component resulting from a successfully exploited vulnerability. This metric refers to smart contract features and functionality, not state. Availability impact directly affecting Deposit or Yield is excluded.

### DEPOSIT (D):

Measures the impact to the deposits made to the contract by either users or owners.

### YIELD (Y):

Measures the impact to the yield generated by the contract for either users or owners.

### METRICS:

IMPACT METRIC ( $M_I$ )	METRIC VALUE	NUMERICAL VALUE
Confidentiality (C)	None (I:N) Low (I:L) Medium (I:M) High (I:H) Critical (I:C)	0 0.25 0.5 0.75 1

IMPACT METRIC ( $M_I$ )	METRIC VALUE	NUMERICAL VALUE
Integrity (I)	None (I:N) Low (I:L) Medium (I:M) High (I:H) Critical (I:C)	0 0.25 0.5 0.75 1
Availability (A)	None (A:N) Low (A:L) Medium (A:M) High (A:H) Critical (A:C)	0 0.25 0.5 0.75 1
Deposit (D)	None (D:N) Low (D:L) Medium (D:M) High (D:H) Critical (D:C)	0 0.25 0.5 0.75 1
Yield (Y)	None (Y:N) Low (Y:L) Medium (Y:M) High (Y:H) Critical (Y:C)	0 0.25 0.5 0.75 1

Impact  $I$  is calculated using the following formula:

$$I = \max(m_I) + \frac{\sum m_I - \max(m_I)}{4}$$

## 5.3 SEVERITY COEFFICIENT

### REVERSIBILITY (R):

Describes the share of the exploited vulnerability effects that can be reversed. For upgradeable contracts, assume the contract private key is available.

### SCOPE (S):

Captures whether a vulnerability in one vulnerable contract impacts resources in other contracts.

### METRICS:

SEVERITY COEFFICIENT ( $C$ )	COEFFICIENT VALUE	NUMERICAL VALUE
Reversibility ( $r$ )	None (R:N) Partial (R:P) Full (R:F)	1 0.5 0.25
Scope ( $s$ )	Changed (S:C) Unchanged (S:U)	1.25 1

Severity Coefficient  $C$  is obtained by the following product:

$$C = rs$$

The Vulnerability Severity Score  $S$  is obtained by:

$$S = \min(10, EIC * 10)$$

The score is rounded up to 1 decimal places.

SEVERITY	SCORE VALUE RANGE
Critical	9 - 10
High	7 - 8.9
Medium	4.5 - 6.9
Low	2 - 4.4
Informational	0 - 1.9

## 6. SCOPE

**Out-of-Scope:** New features/implementations after the remediation commit IDs.

## 7. ASSESSMENT SUMMARY & FINDINGS OVERVIEW

CRITICAL	HIGH	MEDIUM	LOW	INFORMATIONAL
0	0	0	0	4

SECURITY ANALYSIS	RISK LEVEL	REMEDIATION DATE
HAL-01 USAGE OF VULNERABLE CRATES	INFORMATIONAL	-
HAL-02 UNIMPLEMENTED RPC METHOD	INFORMATIONAL	-
HAL-03 UNIMPLEMENTED CUSTOM ORIGIN	INFORMATIONAL	-
HAL-04 MISSING REMOVE APP ID FUNCTIONALITY	INFORMATIONAL	-

## **8. FINDINGS & TECH DETAILS**

### **8.1 HAL-01 USAGE OF VULNERABLE CRATES**

// INFORMATIONAL

#### Description

Finding description placeholder

#### Score

Impact:

Likelihood:

### **8.2 HAL-02 UNIMPLEMENTED RPC METHOD**

// INFORMATIONAL

#### Description

Finding description placeholder

#### Score

Impact:

Likelihood:

### **8.3 HAL-03 UNIMPLEMENTED CUSTOM ORIGIN**

// INFORMATIONAL

#### Description

Finding description placeholder

#### Score

Impact:

Likelihood:

## **8.4 HAL-04 MISSING REMOVE APP ID FUNCTIONALITY**

// INFORMATIONAL

### Description

Finding description placeholder

### Score

Impact:

Likelihood:

## **9. AUTOMATED TESTING**

### **AUTOMATED ANALYSIS**

#### **Description**

Halborn used automated security scanners to assist with detection of well-known security issues and vulnerabilities. Among the tools used was cargo audit, a security scanner for vulnerabilities reported to the RustSec Advisory Database. All vulnerabilities published in <https://crates.io> are stored in a repository named The RustSec Advisory Database. cargo audit is a human-readable version of the advisory database which performs a scanning on Cargo.lock. Security Detections are only in scope. All vulnerabilities shown here were already disclosed in the above report. However, to better assist the developers maintaining this code, the auditors are including the output with the dependencies tree, and this is included in the cargo audit output to better know the dependencies affected by unmaintained and vulnerable crates.

```
\begin{center} \begin{tabular}{||p{2cm}|p{9cm}|} \hline \textbf{ID} & \textbf{package} & \textbf{Short Description} \\ \hline \ href{https://rustsec.org/advisories/RUSTSEC-2021-0130} & lru 0.6.6 & Use after free in lru crate, upgrade to >=0.7.1 \\ \hline \end{tabular} \end{center}
```

#### **Code Location**

#### **Dependency Tree For Lru**

```
lru 0.6.6
└── libp2p-identify 0.31.0
    ├── libp2p-metrics 0.1.0
    │   └── libp2p 0.40.0
    │       ├── sc-telemetry 4.0.0-dev
    │       │   ├── sc-service 0.10.0-dev
    │       │   │   ├── sc-cli 0.10.0-dev
    │       │   │   │   ├── frame-benchmarking-cli 4.0.0-dev
    │       │   │   │   │   └── data-avail 1.0.0
    │       │   │   │   └── data-avail 1.0.0
    │       │   ├── frame-benchmarking-cli 4.0.0-dev
    │       │   └── data-avail 1.0.0
    │       ├── sc-finality-grandpa 0.10.0-dev
    │       │   ├── sc-sync-state-rpc 0.10.0-dev
    │       │   │   └── data-avail 1.0.0
    │       │   ├── sc-finality-grandpa-rpc 0.10.0-dev
    │       │   │   └── data-avail 1.0.0
    │       │   └── data-avail 1.0.0
    │       ├── sc-consensus-slots 0.10.0-dev
    │       │   ├── sc-consensus-babe 0.10.0-dev
    │       │   │   ├── sc-sync-state-rpc 0.10.0-dev
    │       │   │   │   ├── sc-consensus-babe-rpc 0.10.0-dev
    │       │   │   │   │   └── data-avail 1.0.0
    │       │   │   └── data-avail 1.0.0
    │       └── data-avail 1.0.0
```

```
    |   └── sc-consensus-aura 0.10.0-dev
    |       └── data-avail 1.0.0
    |   └── data-avail 1.0.0
    ├── sc-consensus-babe 0.10.0-dev
    ├── sc-consensus-aura 0.10.0-dev
    ├── sc-cli 0.10.0-dev
    ├── sc-chain-spec 4.0.0-dev
    |   ├── sc-sync-state-rpc 0.10.0-dev
    |   ├── sc-service 0.10.0-dev
    |   └── sc-rpc-api 0.10.0-dev
    |       ├── substrate-frame-rpc-system 4.0.0-dev
    |       |   └── data-avail 1.0.0
    |       ├── sc-sync-state-rpc 0.10.0-dev
    |       ├── sc-rpc 4.0.0-dev
    |       |   ├── sc-service 0.10.0-dev
    |       |   ├── sc-finality-grandpa-rpc 0.10.0-dev
    |       |   └── data-avail 1.0.0
    |       ├── sc-consensus-babe-rpc 0.10.0-dev
    |       └── data-avail 1.0.0
    ├── sc-rpc 4.0.0-dev
    └── data-avail 1.0.0
    └── sc-basic-authorship 0.10.0-dev
        └── data-avail 1.0.0
    └── data-avail 1.0.0
└── sc-peerset 4.0.0-dev
    └── sc-network 0.10.0-dev
        ├── sc-service 0.10.0-dev
        ├── sc-offchain 4.0.0-dev
        |   └── sc-service 0.10.0-dev
        ├── sc-network-gossip 0.10.0-dev
        |   └── sc-finality-grandpa 0.10.0-dev
        ├── sc-informant 0.10.0-dev
        |   └── sc-service 0.10.0-dev
        ├── sc-finality-grandpa 0.10.0-dev
        ├── sc-cli 0.10.0-dev
        ├── sc-chain-spec 4.0.0-dev
        ├── sc-authority-discovery 0.10.0-dev
        |   └── data-avail 1.0.0
        └── data-avail 1.0.0
└── sc-network-gossip 0.10.0-dev
└── sc-network 0.10.0-dev
└── sc-consensus 0.10.0-dev
    ├── sc-service 0.10.0-dev
    ├── sc-network 0.10.0-dev
    ├── sc-finality-grandpa 0.10.0-dev
    └── sc-consensus-slots 0.10.0-dev
```

```

    └── sc-consensus-epochs 0.10.0-dev
        ├── sc-sync-state-rpc 0.10.0-dev
        ├── sc-consensus-babe-rpc 0.10.0-dev
        ├── sc-consensus-babe 0.10.0-dev
        └── data-avail 1.0.0
    ├── sc-consensus-babe 0.10.0-dev
    ├── sc-consensus-aura 0.10.0-dev
    └── data-avail 1.0.0
└── sc-cli 0.10.0-dev
    └── sc-authority-discovery 0.10.0-dev
└── libp2p 0.40.0

```

\begin{center} \begin{tabular}{||p{2cm}|p{9cm}|} \hline \textbf{ID} & \textbf{package} & \textbf{Short Description} \\ \hline \ href{https://rustsec.org/advisories/RUSTSEC-2020-0071} & time 0.1.44 & Potential segfault in the time crate, upgrade to >=0.2.23 \\ \hline \end{tabular} \end{center}

## Code Location

### Dependency Tree For Time

```

time 0.1.44
└── chrono 0.4.19
    ├── tracing-subscriber 0.2.25
    │   ├── sp-tracing 4.0.0-dev
    │   │   ├── sp-runtime-interface 4.0.0-dev
    │   │   ├── sp-tasks 4.0.0-dev
    │   │   └── sc-executor 0.10.0-dev
    │   │       ├── sc-service 0.10.0-dev
    │   │       │   ├── sc-cli 0.10.0-dev
    │   │       │   │   ├── frame-benchmarking-cli 4.0.0-dev
    │   │       │   │   └── data-avail 1.0.0
    │   │       │   └── data-avail 1.0.0
    │   │       ├── frame-benchmarking-cli 4.0.0-dev
    │   │       └── data-avail 1.0.0
    │   ├── sc-client-api 4.0.0-dev
    │   │   ├── substrate-frame-rpc-system 4.0.0-dev
    │   │   │   └── data-avail 1.0.0
    │   │   ├── sc-transaction-pool 4.0.0-dev
    │   │   │   ├── sc-service 0.10.0-dev
    │   │   │   └── data-avail 1.0.0
    │   │   ├── sc-tracing 4.0.0-dev
    │   │   │   ├── sc-service 0.10.0-dev
    │   │   │   ├── sc-rpc 4.0.0-dev
    │   │   │   │   ├── sc-service 0.10.0-dev
    │   │   │   │   └── sc-finality-grandpa-rpc 0.10.0-dev
    │   │   │   └── data-avail 1.0.0
    │   │   └── sc-service 0.10.0-dev
    │   └── sc-service 0.10.0-dev
        └── data-avail 1.0.0

```

```
    └── data-avail 1.0.0
        └── sc-cli 0.10.0-dev
    ├── sc-sync-state-rpc 0.10.0-dev
    │   └── data-avail 1.0.0
    ├── sc-state-db 0.10.0-dev
    │   └── sc-client-db 0.10.0-dev
    │       ├── sc-service 0.10.0-dev
    │       ├── kate-rpc 0.1.0
    │       │   └── data-avail 1.0.0
    │       └── frame-benchmarking-cli 4.0.0-dev
    │           └── data-avail 1.0.0
    ├── sc-service 0.10.0-dev
    ├── sc-rpc 4.0.0-dev
    ├── sc-offchain 4.0.0-dev
    │   └── sc-service 0.10.0-dev
    ├── sc-network 0.10.0-dev
    │   ├── sc-service 0.10.0-dev
    │   ├── sc-offchain 4.0.0-dev
    │   └── sc-network-gossip 0.10.0-dev
    │       └── sc-finality-grandpa 0.10.0-dev
    │           ├── sc-sync-state-rpc 0.10.0-dev
    │           ├── sc-finality-grandpa-rpc 0.10.0-dev
    │           └── data-avail 1.0.0
    ├── sc-informant 0.10.0-dev
    │   └── sc-service 0.10.0-dev
    ├── sc-finality-grandpa 0.10.0-dev
    ├── sc-cli 0.10.0-dev
    ├── sc-chain-spec 4.0.0-dev
    │   ├── sc-sync-state-rpc 0.10.0-dev
    │   ├── sc-service 0.10.0-dev
    │   └── sc-rpc-api 0.10.0-dev
    │       ├── substrate-frame-rpc-system 4.0.0-dev
    │       ├── sc-sync-state-rpc 0.10.0-dev
    │       ├── sc-rpc 4.0.0-dev
    │       ├── sc-consensus-babe-rpc 0.10.0-dev
    │       │   └── data-avail 1.0.0
    │       └── data-avail 1.0.0
    ├── sc-rpc 4.0.0-dev
    │   └── data-avail 1.0.0
    ├── sc-authority-discovery 0.10.0-dev
    │   └── data-avail 1.0.0
    └── data-avail 1.0.0
    └── sc-informant 0.10.0-dev
    ├── sc-finality-grandpa-rpc 0.10.0-dev
    ├── sc-finality-grandpa 0.10.0-dev
    └── sc-consensus-uncles 0.10.0-dev
```

```
    └── data-avail 1.0.0
    ├── sc-consensus-slots 0.10.0-dev
    │   ├── sc-consensus-babe 0.10.0-dev
    │   │   ├── sc-sync-state-rpc 0.10.0-dev
    │   │   ├── sc-consensus-babe-rpc 0.10.0-dev
    │   │   └── data-avail 1.0.0
    │   ├── sc-consensus-aura 0.10.0-dev
    │   │   └── data-avail 1.0.0
    │   └── data-avail 1.0.0
    ├── sc-consensus-epochs 0.10.0-dev
    │   ├── sc-sync-state-rpc 0.10.0-dev
    │   ├── sc-consensus-babe-rpc 0.10.0-dev
    │   ├── sc-consensus-babe 0.10.0-dev
    │   └── data-avail 1.0.0
    ├── sc-consensus-babe 0.10.0-dev
    ├── sc-consensus-aura 0.10.0-dev
    ├── sc-consensus 0.10.0-dev
    │   ├── sc-service 0.10.0-dev
    │   ├── sc-network 0.10.0-dev
    │   ├── sc-finality-grandpa 0.10.0-dev
    │   ├── sc-consensus-slots 0.10.0-dev
    │   ├── sc-consensus-epochs 0.10.0-dev
    │   ├── sc-consensus-babe 0.10.0-dev
    │   ├── sc-consensus-aura 0.10.0-dev
    │   └── data-avail 1.0.0
    ├── sc-client-db 0.10.0-dev
    ├── sc-cli 0.10.0-dev
    ├── sc-block-builder 0.10.0-dev
    │   ├── sc-service 0.10.0-dev
    │   ├── sc-rpc 4.0.0-dev
    │   ├── sc-network 0.10.0-dev
    │   ├── sc-finality-grandpa 0.10.0-dev
    │   ├── sc-consensus-aura 0.10.0-dev
    │   └── sc-basic-authorship 0.10.0-dev
    │       └── data-avail 1.0.0
    ├── sc-basic-authorship 0.10.0-dev
    ├── sc-authority-discovery 0.10.0-dev
    ├── kate-rpc 0.1.0
    └── data-avail 1.0.0
    ├── frame-benchmarking-cli 4.0.0-dev
    └── data-avail 1.0.0
    ├── sp-io 4.0.0-dev
    │   ├── sp-tasks 4.0.0-dev
    │   ├── sp-runtime 4.0.0-dev
    │   │   ├── substrate-frame-rpc-system 4.0.0-dev
    │   │   └── sp-version 4.0.0-dev
```

```
    └── sp-consensus 0.10.0-dev
        ├── sp-consensus-babe 0.10.0-dev
        │   ├── sc-consensus-babe-rpc 0.10.0-dev
        │   ├── sc-consensus-babe 0.10.0-dev
        │   ├── pallet-babe 4.0.0-dev
        │   └── da-runtime 4.0.0
        │       └── data-avail 1.0.0
        ├── data-avail 1.0.0
        └── da-runtime 4.0.0
    └── sp-consensus-aura 0.10.0-dev
        ├── sc-consensus-aura 0.10.0-dev
        └── data-avail 1.0.0
    └── sp-blockchain 4.0.0-dev
        ├── substrate-frame-rpc-system 4.0.0-dev
        ├── sc-transaction-pool-api 4.0.0-dev
        │   ├── substrate-frame-rpc-system 4.0.0-dev
        │   ├── sc-transaction-pool 4.0.0-dev
        │   ├── sc-service 0.10.0-dev
        │   ├── sc-rpc-api 0.10.0-dev
        │   ├── sc-rpc 4.0.0-dev
        │   ├── sc-informant 0.10.0-dev
        │   ├── sc-client-api 4.0.0-dev
        │   ├── sc-basic-authorship 0.10.0-dev
        │   └── data-avail 1.0.0
        ├── sc-transaction-pool 4.0.0-dev
        ├── sc-tracing 4.0.0-dev
        ├── sc-sync-state-rpc 0.10.0-dev
        ├── sc-service 0.10.0-dev
        ├── sc-rpc 4.0.0-dev
        ├── sc-network 0.10.0-dev
        ├── sc-informant 0.10.0-dev
        ├── sc-finality-grandpa-rpc 0.10.0-dev
        ├── sc-finality-grandpa 0.10.0-dev
        ├── sc-consensus-slots 0.10.0-dev
        ├── sc-consensus-epochs 0.10.0-dev
        ├── sc-consensus-babe-rpc 0.10.0-dev
        ├── sc-consensus-babe 0.10.0-dev
        ├── sc-consensus-aura 0.10.0-dev
        ├── sc-consensus 0.10.0-dev
        ├── sc-client-db 0.10.0-dev
        ├── sc-client-api 4.0.0-dev
        ├── sc-cli 0.10.0-dev
        ├── sc-block-builder 0.10.0-dev
        ├── sc-basic-authorship 0.10.0-dev
        ├── sc-authority-discovery 0.10.0-dev
        └── pallet-transaction-payment-rpc 4.0.0-dev
```

```
    └── data-avail 1.0.0
    └── pallet-mmr-rpc 3.0.0
        └── data-avail 1.0.0
    └── kate-rpc 0.1.0
    └── data-avail 1.0.0
    └── sc-service 0.10.0-dev
    └── sc-network 0.10.0-dev
    └── sc-finality-grandpa 0.10.0-dev
    └── sc-consensus-slots 0.10.0-dev
    └── sc-consensus-babe-rpc 0.10.0-dev
    └── sc-consensus-babe 0.10.0-dev
    └── sc-consensus-aura 0.10.0-dev
    └── sc-consensus 0.10.0-dev
    └── sc-client-api 4.0.0-dev
    └── sc-basic-authorship 0.10.0-dev
        └── data-avail 1.0.0
    └── sp-api 4.0.0-dev
        ├── substrate-frame-rpc-system 4.0.0-dev
        ├── sp-transaction-pool 4.0.0-dev
            ├── sc-transaction-pool 4.0.0-dev
            ├── sc-service 0.10.0-dev
            └── data-avail 1.0.0
        └── da-runtime 4.0.0
    └── sp-timestamp 4.0.0-dev
        ├── sp-consensus-babe 0.10.0-dev
        ├── sp-consensus-aura 0.10.0-dev
        ├── sc-consensus-slots 0.10.0-dev
        ├── pallet-timestamp 4.0.0-dev
            ├── pallet-session 4.0.0-dev
                ├── pallet-staking 4.0.0-dev
                    └── da-runtime 4.0.0
                ├── pallet-grandpa 4.0.0-dev
                    └── da-runtime 4.0.0
                ├── pallet-babe 4.0.0-dev
                └── pallet-authority-discovery
```

4.0.0-dev

```
    └── pallet-babe 4.0.0-dev
    └── da-runtime 4.0.0
        └── data-avail 1.0.0
    └── sp-session 4.0.0-dev
        ├── sc-service 0.10.0-dev
        ├── sc-rpc 4.0.0-dev
        ├── pallet-session 4.0.0-dev
        └── pallet-grandpa 4.0.0-dev
```

```
        └── pallet-babe 4.0.0-dev
            └── da-runtime 4.0.0
        └── sp-offchain 4.0.0-dev
            ├── sc-rpc 4.0.0-dev
            ├── sc-offchain 4.0.0-dev
            └── da-runtime 4.0.0
        └── sp-finality-grandpa 4.0.0-dev
            ├── sc-network 0.10.0-dev
            ├── sc-finality-grandpa 0.10.0-dev
            ├── pallet-grandpa 4.0.0-dev
            └── data-avail 1.0.0
        └── sp-consensus-babe 0.10.0-dev
        └── sp-consensus-aura 0.10.0-dev
        └── sp-blockchain 4.0.0-dev
        └── sp-block-builder 4.0.0-dev
            ├── substrate-frame-rpc-system 4.0.0-dev
            ├── sc-service 0.10.0-dev
            ├── sc-consensus-babe 0.10.0-dev
            ├── sc-consensus-aura 0.10.0-dev
            ├── sc-block-builder 0.10.0-dev
            ├── data-avail 1.0.0
            └── da-runtime 4.0.0
        └── sp-authority-discovery 4.0.0-dev
            ├── sc-authority-discovery 0.10.0-dev
            ├── pallet-authority-discovery 4.0.0-dev
            ├── data-avail 1.0.0
            └── da-runtime 4.0.0
        └── sc-transaction-pool 4.0.0-dev
        └── sc-tracing 4.0.0-dev
        └── sc-service 0.10.0-dev
        └── sc-rpc 4.0.0-dev
        └── sc-offchain 4.0.0-dev
        └── sc-finality-grandpa 0.10.0-dev
        └── sc-executor 0.10.0-dev
        └── sc-consensus-slots 0.10.0-dev
            ├── sc-consensus-babe-rpc 0.10.0-dev
            ├── sc-consensus-babe 0.10.0-dev
            ├── sc-consensus-aura 0.10.0-dev
            ├── sc-consensus 0.10.0-dev
            ├── sc-client-api 4.0.0-dev
            ├── sc-block-builder 0.10.0-dev
            ├── sc-basic-authorship 0.10.0-dev
            ├── sc-authority-discovery 0.10.0-dev
            └── pallet-transaction-payment-rpc-runtime-api
4.0.0-dev
    |   |   |   |   |   |   |   └── pallet-transaction-payment-rpc 4.0.0-dev
```

```
    └── da-runtime 4.0.0
    ├── pallet-transaction-payment-rpc 4.0.0-dev
    ├── pallet-mmr-rpc 3.0.0
    ├── pallet-mmr-primitives 4.0.0-dev
    │   ├── pallet-mmr-rpc 3.0.0
    │   └── pallet-mmr 4.0.0-dev
    │       └── da-runtime 4.0.0
    ├── kate-rpc-runtime-api 0.1.0
    │   ├── kate-rpc 0.1.0
    │   └── da-runtime 4.0.0
    ├── kate-rpc 0.1.0
    ├── frame-system-rpc-runtime-api 4.0.0-dev
    │   ├── substrate-frame-rpc-system 4.0.0-dev
    │   ├── kate-rpc 0.1.0
    │   ├── data-avail 1.0.0
    │   └── da-runtime 4.0.0
    ├── frame-benchmarking 4.0.0-dev
    │   ├── pallet-timestamp 4.0.0-dev
    │   ├── pallet-scheduler 4.0.0-dev
    │   │   └── da-runtime 4.0.0
    │   ├── pallet-mmr 4.0.0-dev
    │   ├── pallet-membership 4.0.0-dev
    │   │   └── da-runtime 4.0.0
    │   ├── pallet-grandpa 4.0.0-dev
    │   ├── pallet-democracy 4.0.0-dev
    │   │   └── da-runtime 4.0.0
    │   ├── pallet-collective 4.0.0-dev
    │   │   └── da-runtime 4.0.0
    │   ├── pallet-balances 4.0.0-dev
    │   │   ├── pallet-treasury 4.0.0-dev
    │   │   │   ├── pallet-tips 4.0.0-dev
    │   │   │   │   └── da-runtime 4.0.0
    │   │   │   ├── pallet-bounties 4.0.0-dev
    │   │   │   │   └── da-runtime 4.0.0
    │   │   │   └── da-runtime 4.0.0
    │   │   └── pallet-offences 4.0.0-dev
    │   │       └── da-runtime 4.0.0
    │   ├── frame-executive 4.0.0-dev
    │   │   └── da-runtime 4.0.0
    │   ├── da-runtime 4.0.0
    │   └── da-control 1.0.0
    │       ├── data-avail 1.0.0
    │       └── da-runtime 4.0.0
    ├── pallet-babe 4.0.0-dev
    ├── frame-system-benchmarking 4.0.0-dev
    │   └── da-runtime 4.0.0
```

```
    └── frame-benchmarking-cli 4.0.0-dev
        ├── data-avail 1.0.0
        └── da-runtime 4.0.0
            └── da-control 1.0.0
    └── data-avail 1.0.0
        └── da-runtime 4.0.0
    └── sc-service 0.10.0-dev
    └── sc-rpc-api 0.10.0-dev
    └── sc-rpc 4.0.0-dev
    └── sc-executor 0.10.0-dev
    └── sc-consensus-babe 0.10.0-dev
    └── sc-cli 0.10.0-dev
    └── frame-system 4.0.0-dev
        ├── pallet-utility 4.0.0-dev
        │   └── da-runtime 4.0.0
        └── pallet-treasury 4.0.0-dev
        └── pallet-transaction-payment 4.0.0-dev
            └── pallet-transaction-payment-rpc-runtime-
api 4.0.0-dev
    └── pallet-asset-tx-payment 4.0.0-dev
        ├── data-avail 1.0.0
        └── da-runtime 4.0.0
    └── frame-executive 4.0.0-dev
    └── data-avail 1.0.0
    └── da-runtime 4.0.0
        └── da-control 1.0.0
    └── pallet-tips 4.0.0-dev
    └── pallet-timestamp 4.0.0-dev
    └── pallet-sudo 4.0.0-dev
        └── da-runtime 4.0.0
    └── pallet-staking 4.0.0-dev
    └── pallet-session 4.0.0-dev
    └── pallet-scheduler 4.0.0-dev
    └── pallet-randomness-collective-flip 4.0.0-dev
        └── da-runtime 4.0.0
    └── pallet-offences 4.0.0-dev
    └── pallet-mmr-primitives 4.0.0-dev
    └── pallet-mmr 4.0.0-dev
    └── pallet-membership 4.0.0-dev
    └── pallet-indices 4.0.0-dev
        └── da-runtime 4.0.0
    └── pallet-im-online 4.0.0-dev
        ├── data-avail 1.0.0
        └── da-runtime 4.0.0
    └── pallet-grandpa 4.0.0-dev
    └── pallet-elections-phragmen 5.0.0-dev
```

```
          └── pallet-election-provider-multi-phase 4.0.0-  
dev  
          └── da-runtime 4.0.0  
          ├── pallet-democracy 4.0.0-dev  
          ├── pallet-collective 4.0.0-dev  
          ├── pallet-bounties 4.0.0-dev  
          ├── pallet-balances 4.0.0-dev  
          ├── pallet-bags-list 4.0.0-dev  
          │   └── da-runtime 4.0.0  
          ├── pallet-babe 4.0.0-dev  
          ├── pallet-authorship 4.0.0-dev  
          │   ├── pallet-staking 4.0.0-dev  
          │   ├── pallet-im-online 4.0.0-dev  
          │   ├── pallet-grandpa 4.0.0-dev  
          │   ├── pallet-babe 4.0.0-dev  
          │   └── da-runtime 4.0.0  
          ├── pallet-authority-discovery 4.0.0-dev  
          ├── pallet-asset-tx-payment 4.0.0-dev  
          ├── kate-rpc-runtime-api 0.1.0  
          ├── kate-rpc 0.1.0  
          │   ├── frame-system-benchmarking 4.0.0-dev  
          │   ├── frame-executive 4.0.0-dev  
          │   ├── frame-election-provider-support 4.0.0-dev  
          │   │   ├── pallet-staking 4.0.0-dev  
          │   │   └── pallet-election-provider-multi-phase  
4.0.0-dev  
          └── pallet-bags-list 4.0.0-dev  
              └── da-runtime 4.0.0  
          ├── frame-benchmarking 4.0.0-dev  
          ├── data-avail 1.0.0  
          ├── da-runtime 4.0.0  
          └── da-control 1.0.0  
          ├── frame-executive 4.0.0-dev  
          └── da-runtime 4.0.0  
          ├── sp-transaction-storage-proof 4.0.0-dev  
          │   ├── sc-service 0.10.0-dev  
          │   └── data-avail 1.0.0  
          ├── sp-transaction-pool 4.0.0-dev  
          ├── sp-timestamp 4.0.0-dev  
          ├── sp-staking 4.0.0-dev  
          │   ├── sp-session 4.0.0-dev  
          │   ├── pallet-staking 4.0.0-dev  
          │   ├── pallet-session 4.0.0-dev  
          │   ├── pallet-offences 4.0.0-dev  
          │   └── pallet-im-online 4.0.0-dev
```

```
    └── pallet-grandpa 4.0.0-dev
    └── pallet-babe 4.0.0-dev
    └── frame-support 4.0.0-dev
        ├── pallet-utility 4.0.0-dev
        ├── pallet-treasury 4.0.0-dev
        ├── pallet-transaction-payment 4.0.0-dev
        ├── pallet-tips 4.0.0-dev
        ├── pallet-timestamp 4.0.0-dev
        ├── pallet-sudo 4.0.0-dev
        ├── pallet-staking 4.0.0-dev
        ├── pallet-session 4.0.0-dev
        ├── pallet-scheduler 4.0.0-dev
        ├── pallet-randomness-collective-flip 4.0.0-dev
        ├── pallet-offences 4.0.0-dev
        ├── pallet-mmr-primitives 4.0.0-dev
        ├── pallet-mmr 4.0.0-dev
        ├── pallet-membership 4.0.0-dev
        ├── pallet-indices 4.0.0-dev
        ├── pallet-im-online 4.0.0-dev
        ├── pallet-grandpa 4.0.0-dev
        ├── pallet-elections-phragmen 5.0.0-dev
        └── pallet-election-provider-multi-phase 4.0.0-
```

dev

```
    └── pallet-democracy 4.0.0-dev
    └── pallet-collective 4.0.0-dev
    └── pallet-bounties 4.0.0-dev
    └── pallet-balances 4.0.0-dev
    └── pallet-bags-list 4.0.0-dev
    └── pallet-babe 4.0.0-dev
    └── pallet-authorship 4.0.0-dev
    └── pallet-authority-discovery 4.0.0-dev
    └── pallet-asset-tx-payment 4.0.0-dev
    └── kate-rpc 0.1.0
    └── kate 0.1.0
        ├── kate-rpc 0.1.0
        ├── fuzzing 0.1.0
        ├── frame-system 4.0.0-dev
        ├── data-avail 1.0.0
        ├── da-runtime 4.0.0
        └── da-control 1.0.0
    └── frame-system-benchmarking 4.0.0-dev
    └── frame-system 4.0.0-dev
    └── frame-executive 4.0.0-dev
    └── frame-election-provider-support 4.0.0-dev
    └── frame-benchmarking-cli 4.0.0-dev
    └── frame-benchmarking 4.0.0-dev
```

```
    └── data-avail 1.0.0
        └── da-runtime 4.0.0
            └── da-primitives 0.1.0
                ├── kate-rpc 0.1.0
                ├── kate 0.1.0
                ├── fuzzing 0.1.0
                ├── frame-system-benchmarking 4.0.0-dev
                ├── frame-system 4.0.0-dev
                ├── frame-executive 4.0.0-dev
                └── data-avail 1.0.0
                    └── da-runtime 4.0.0
                        └── da-control 1.0.0
                            └── da-control 1.0.0
                            └── da-runtime 4.0.0
                            └── sp-session 4.0.0-dev
                            └── sp-offchain 4.0.0-dev
                    └── sp-npos-elections 4.0.0-dev
                        ├── pallet-elections-phragmen 5.0.0-dev
                        ├── pallet-election-provider-multi-phase 4.0.0-dev
                        ├── frame-election-provider-support 4.0.0-dev
                        └── da-runtime 4.0.0
                    └── sp-keyring 4.0.0-dev
                        ├── sc-cli 0.10.0-dev
                        ├── pallet-indices 4.0.0-dev
                        └── data-avail 1.0.0
                    └── sp-inherents 4.0.0-dev
                        ├── sp-transaction-storage-proof 4.0.0-dev
                        ├── sp-timestamp 4.0.0-dev
                        ├── sp-consensus-babe 0.10.0-dev
                        ├── sp-consensus-aura 0.10.0-dev
                        ├── sp-consensus 0.10.0-dev
                        ├── sp-block-builder 4.0.0-dev
                        ├── sp-authorship 4.0.0-dev
                            ├── sc-consensus-uncles 0.10.0-dev
                            ├── pallet-authorship 4.0.0-dev
                            └── data-avail 1.0.0
                        └── sc-service 0.10.0-dev
                        └── sc-consensus-slots 0.10.0-dev
                            ├── sc-consensus-babe 0.10.0-dev
                            ├── sc-consensus-aura 0.10.0-dev
                            ├── sc-block-builder 0.10.0-dev
                            ├── sc-basic-authorship 0.10.0-dev
                            ├── pallet-timestamp 4.0.0-dev
                            ├── frame-support 4.0.0-dev
                            ├── frame-executive 4.0.0-dev
                            └── data-avail 1.0.0
```

```
    └── da-runtime 4.0.0
    ├── sp-finality-grandpa 4.0.0-dev
    ├── sp-consensus-vrf 0.10.0-dev
    │   ├── sp-consensus-babe 0.10.0-dev
    │   ├── sc-consensus-babe 0.10.0-dev
    │   └── pallet-babe 4.0.0-dev
    ├── sp-consensus-slots 0.10.0-dev
    │   ├── sp-consensus-babe 0.10.0-dev
    │   ├── sp-consensus-aura 0.10.0-dev
    │   ├── sc-consensus-slots 0.10.0-dev
    │   ├── sc-consensus-babe 0.10.0-dev
    │   └── sc-consensus-aura 0.10.0-dev
    ├── sp-consensus-babe 0.10.0-dev
    ├── sp-consensus-aura 0.10.0-dev
    ├── sp-consensus 0.10.0-dev
    ├── sp-blockchain 4.0.0-dev
    ├── sp-block-builder 4.0.0-dev
    ├── sp-authorship 4.0.0-dev
    ├── sp-authority-discovery 4.0.0-dev
    ├── sp-api 4.0.0-dev
    ├── sc-transaction-pool-api 4.0.0-dev
    ├── sc-transaction-pool 4.0.0-dev
    ├── sc-tracing 4.0.0-dev
    ├── sc-sync-state-rpc 0.10.0-dev
    ├── sc-service 0.10.0-dev
    ├── sc-rpc-api 0.10.0-dev
    ├── sc-rpc 4.0.0-dev
    ├── sc-offchain 4.0.0-dev
    ├── sc-network-gossip 0.10.0-dev
    ├── sc-network 0.10.0-dev
    ├── sc-informant 0.10.0-dev
    ├── sc-finality-grandpa-rpc 0.10.0-dev
    ├── sc-finality-grandpa 0.10.0-dev
    ├── sc-consensus-uncles 0.10.0-dev
    ├── sc-consensus-slots 0.10.0-dev
    ├── sc-consensus-epochs 0.10.0-dev
    ├── sc-consensus-babe-rpc 0.10.0-dev
    ├── sc-consensus-babe 0.10.0-dev
    ├── sc-consensus-aura 0.10.0-dev
    ├── sc-consensus 0.10.0-dev
    ├── sc-client-db 0.10.0-dev
    ├── sc-client-api 4.0.0-dev
    ├── sc-cli 0.10.0-dev
    ├── sc-chain-spec 4.0.0-dev
    ├── sc-block-builder 0.10.0-dev
    └── sc-basic-authorship 0.10.0-dev
```

```
    |   └── sc-authority-discovery 0.10.0-dev
    |   └── pallet-utility 4.0.0-dev
    |   └── pallet-treasury 4.0.0-dev
    |   └── pallet-transaction-payment-rpc-runtime-api 4.0.0-dev
    |   └── pallet-transaction-payment-rpc 4.0.0-dev
    |   └── pallet-transaction-payment 4.0.0-dev
    |   └── pallet-tips 4.0.0-dev
    |   └── pallet-timestamp 4.0.0-dev
    |   └── pallet-sudo 4.0.0-dev
    |   └── pallet-staking 4.0.0-dev
    |   └── pallet-session 4.0.0-dev
    |   └── pallet-scheduler 4.0.0-dev
    |   └── pallet-randomness-collective-flip 4.0.0-dev
    |   └── pallet-offences 4.0.0-dev
    |   └── pallet-mmr-rpc 3.0.0
    |   └── pallet-mmr-primitives 4.0.0-dev
    |   └── pallet-mmr 4.0.0-dev
    |   └── pallet-membership 4.0.0-dev
    |   └── pallet-indices 4.0.0-dev
    |   └── pallet-im-online 4.0.0-dev
    |   └── pallet-grandpa 4.0.0-dev
    |   └── pallet-elections-phragmen 5.0.0-dev
    |   └── pallet-election-provider-multi-phase 4.0.0-dev
    |   └── pallet-democracy 4.0.0-dev
    |   └── pallet-collective 4.0.0-dev
    |   └── pallet-bounties 4.0.0-dev
    |   └── pallet-balances 4.0.0-dev
    |   └── pallet-bags-list 4.0.0-dev
    |   └── pallet-babe 4.0.0-dev
    |   └── pallet-authorship 4.0.0-dev
    |   └── pallet-authority-discovery 4.0.0-dev
    |   └── pallet-asset-tx-payment 4.0.0-dev
    |   └── kate-rpc 0.1.0
    |   └── frame-system-benchmarking 4.0.0-dev
    |   └── frame-system 4.0.0-dev
    |   └── frame-support 4.0.0-dev
    |   └── frame-executive 4.0.0-dev
    |   └── frame-benchmarking-cli 4.0.0-dev
    |   └── frame-benchmarking 4.0.0-dev
    |   └── data-avail 1.0.0
    |   └── da-runtime 4.0.0
    |   └── da-primitives 0.1.0
    |       └── da-control 1.0.0
    |   └── sp-application-crypto 4.0.0-dev
    |       └── sp-runtime 4.0.0-dev
    |   └── sp-finality-grandpa 4.0.0-dev
```

```
    |   ├── sp-consensus-babe 0.10.0-dev
    |   ├── sp-consensus-aura 0.10.0-dev
    |   ├── sp-authority-discovery 4.0.0-dev
    |   ├── sc-service 0.10.0-dev
    |   ├── sc-keystore 4.0.0-dev
    |   |   ├── sc-service 0.10.0-dev
    |   |   ├── sc-finality-grandpa 0.10.0-dev
    |   |   ├── sc-consensus-babe 0.10.0-dev
    |   |   ├── sc-cli 0.10.0-dev
    |   |   └── data-avail 1.0.0
    |   ├── sc-finality-grandpa 0.10.0-dev
    |   ├── sc-consensus-babe-rpc 0.10.0-dev
    |   ├── sc-consensus-babe 0.10.0-dev
    |   ├── sc-consensus-aura 0.10.0-dev
    |   ├── pallet-staking 4.0.0-dev
    |   ├── pallet-im-online 4.0.0-dev
    |   ├── pallet-grandpa 4.0.0-dev
    |   ├── pallet-babe 4.0.0-dev
    |   |   └── pallet-authority-discovery 4.0.0-dev
    |   ├── sc-executor 0.10.0-dev
    |   ├── sc-consensus-babe 0.10.0-dev
    |   ├── pallet-utility 4.0.0-dev
    |   ├── pallet-transaction-payment 4.0.0-dev
    |   ├── pallet-tips 4.0.0-dev
    |   ├── pallet-sudo 4.0.0-dev
    |   ├── pallet-staking 4.0.0-dev
    |   ├── pallet-session 4.0.0-dev
    |   ├── pallet-scheduler 4.0.0-dev
    |   ├── pallet-mmr 4.0.0-dev
    |   ├── pallet-membership 4.0.0-dev
    |   ├── pallet-indices 4.0.0-dev
    |   ├── pallet-im-online 4.0.0-dev
    |   ├── pallet-grandpa 4.0.0-dev
    |   ├── pallet-elections-phragmen 5.0.0-dev
    |   ├── pallet-election-provider-multi-phase 4.0.0-dev
    |   ├── pallet-democracy 4.0.0-dev
    |   ├── pallet-collective 4.0.0-dev
    |   ├── pallet-bounties 4.0.0-dev
    |   ├── pallet-babe 4.0.0-dev
    |   ├── pallet-asset-tx-payment 4.0.0-dev
    |   ├── frame-system-benchmarking 4.0.0-dev
    |   ├── frame-system 4.0.0-dev
    |   ├── frame-support 4.0.0-dev
    |   ├── frame-executive 4.0.0-dev
    |   ├── frame-benchmarking 4.0.0-dev
    |   └── da-runtime 4.0.0
```

```
    |   └── da-primitives 0.1.0
    |       └── da-control 1.0.0
    └── sp-core 4.0.0-dev
        ├── substrate-frame-rpc-system 4.0.0-dev
        ├── sp-trie 4.0.0-dev
        |   ├── sp-transaction-storage-proof 4.0.0-dev
        |   ├── sp-state-machine 0.10.0-dev
        |   |   ├── sp-io 4.0.0-dev
        |   |   ├── sp-consensus 0.10.0-dev
        |   |   ├── sp-blockchain 4.0.0-dev
        |   |   ├── sp-api 4.0.0-dev
        |   |   ├── sc-service 0.10.0-dev
        |   |   ├── sc-consensus-slots 0.10.0-dev
        |   |   ├── sc-consensus 0.10.0-dev
        |   |   ├── sc-client-db 0.10.0-dev
        |   |   ├── sc-client-api 4.0.0-dev
        |   |   ├── sc-block-builder 0.10.0-dev
        |   |   ├── frame-support 4.0.0-dev
        |   |   └── frame-benchmarking-cli 4.0.0-dev
        |   ├── sp-io 4.0.0-dev
        |   ├── sc-service 0.10.0-dev
        |   ├── sc-executor 0.10.0-dev
        |   ├── sc-client-db 0.10.0-dev
        |   ├── sc-client-api 4.0.0-dev
        |   └── pallet-session 4.0.0-dev
        ├── sp-transaction-storage-proof 4.0.0-dev
        ├── sp-tasks 4.0.0-dev
        ├── sp-state-machine 0.10.0-dev
        ├── sp-session 4.0.0-dev
        ├── sp-runtime 4.0.0-dev
        ├── sp-rpc 4.0.0-dev
        |   ├── sc-tracing 4.0.0-dev
        |   ├── sc-rpc-api 0.10.0-dev
        |   ├── sc-rpc 4.0.0-dev
        |   ├── pallet-transaction-payment-rpc 4.0.0-dev
        |   ├── kate-rpc 0.1.0
        |   └── data-avail 1.0.0
        ├── sp-offchain 4.0.0-dev
        ├── sp-npos-elections 4.0.0-dev
        ├── sp-keystore 0.10.0-dev
        |   ├── sp-io 4.0.0-dev
        |   ├── sp-finality-grandpa 4.0.0-dev
        |   ├── sp-consensus-babe 0.10.0-dev
        |   ├── sc-service 0.10.0-dev
        |   ├── sc-rpc 4.0.0-dev
        |   └── sc-keystore 4.0.0-dev
```

```
    |   ├── sc-finality-grandpa 0.10.0-dev
    |   ├── sc-consensus-babe-rpc 0.10.0-dev
    |   ├── sc-consensus-babe 0.10.0-dev
    |   ├── sc-consensus-aura 0.10.0-dev
    |   ├── sc-client-api 4.0.0-dev
    |   ├── sc-cli 0.10.0-dev
    |   ├── sc-authority-discovery 0.10.0-dev
    |   └── frame-benchmarking-cli 4.0.0-dev
        └── data-avail 1.0.0
    ├── sp-keyring 4.0.0-dev
    ├── sp-io 4.0.0-dev
    ├── sp-inherents 4.0.0-dev
    ├── sp-finality-grandpa 4.0.0-dev
    ├── sp-consensus-vrf 0.10.0-dev
    ├── sp-consensus-babe 0.10.0-dev
    ├── sp-consensus 0.10.0-dev
    ├── sp-application-crypto 4.0.0-dev
    ├── sp-api 4.0.0-dev
    ├── sc-transaction-pool 4.0.0-dev
    ├── sc-tracing 4.0.0-dev
    ├── sc-state-db 0.10.0-dev
    ├── sc-service 0.10.0-dev
    ├── sc-rpc-api 0.10.0-dev
    ├── sc-rpc 4.0.0-dev
    ├── sc-offchain 4.0.0-dev
    ├── sc-network 0.10.0-dev
    ├── sc-keystore 4.0.0-dev
    ├── sc-finality-grandpa-rpc 0.10.0-dev
    ├── sc-finality-grandpa 0.10.0-dev
    ├── sc-executor-wasmtime 0.10.0-dev
        └── sc-executor 0.10.0-dev
    ├── sc-executor-wasi 0.10.0-dev
        └── sc-executor 0.10.0-dev
    ├── sc-executor-common 0.10.0-dev
        ├── sc-executor-wasmtime 0.10.0-dev
        ├── sc-executor-wasi 0.10.0-dev
        └── sc-executor 0.10.0-dev
    ├── sc-executor 0.10.0-dev
    ├── sc-consensus-slots 0.10.0-dev
    ├── sc-consensus-babe-rpc 0.10.0-dev
    ├── sc-consensus-babe 0.10.0-dev
    ├── sc-consensus-aura 0.10.0-dev
    ├── sc-consensus 0.10.0-dev
    ├── sc-client-db 0.10.0-dev
    ├── sc-client-api 4.0.0-dev
    └── sc-cli 0.10.0-dev
```

```
    |   ├── sc-chain-spec 4.0.0-dev
    |   ├── sc-block-builder 0.10.0-dev
    |   ├── sc-basic-authorship 0.10.0-dev
    |   ├── sc-authority-discovery 0.10.0-dev
    |   ├── sc-allocator 4.1.0-dev
    |   |   ├── sc-executor-wasmtime 0.10.0-dev
    |   |   ├── sc-executor-wasm 0.10.0-dev
    |   |   └── sc-executor-common 0.10.0-dev
    |   ├── pallet-utility 4.0.0-dev
    |   ├── pallet-transaction-payment-rpc 4.0.0-dev
    |   ├── pallet-transaction-payment 4.0.0-dev
    |   ├── pallet-tips 4.0.0-dev
    |   ├── pallet-session 4.0.0-dev
    |   ├── pallet-mmr-rpc 3.0.0
    |   ├── pallet-mmr-primitives 4.0.0-dev
    |   ├── pallet-mmr 4.0.0-dev
    |   ├── pallet-membership 4.0.0-dev
    |   ├── pallet-indices 4.0.0-dev
    |   ├── pallet-im-online 4.0.0-dev
    |   ├── pallet-grandpa 4.0.0-dev
    |   ├── pallet-elections-phragmen 5.0.0-dev
    |   ├── pallet-election-provider-multi-phase 4.0.0-dev
    |   ├── pallet-collective 4.0.0-dev
    |   ├── pallet-bounties 4.0.0-dev
    |   ├── pallet-asset-tx-payment 4.0.0-dev
    |   ├── kate-proof 0.1.0
    |   |   └── kate 0.1.0
    |   ├── kate 0.1.0
    |   ├── frame-system-benchmarking 4.0.0-dev
    |   ├── frame-system 4.0.0-dev
    |   ├── frame-support 4.0.0-dev
    |   ├── frame-executive 4.0.0-dev
    |   ├── frame-benchmarking-cli 4.0.0-dev
    |   ├── data-avail 1.0.0
    |   ├── da-runtime 4.0.0
    |   ├── da-primitives 0.1.0
    |   └── da-control 1.0.0
    |   ├── sc-executor-wasmtime 0.10.0-dev
    |   ├── sc-executor-wasm 0.10.0-dev
    |   ├── sc-executor 0.10.0-dev
    |   ├── frame-system 4.0.0-dev
    |   ├── frame-benchmarking 4.0.0-dev
    |   └── da-primitives 0.1.0
    ├── sp-io 4.0.0-dev
    ├── sc-transaction-pool 4.0.0-dev
    └── sc-tracing 4.0.0-dev
```

```
|   |   ├── sc-service 0.10.0-dev
|   |   ├── sc-rpc-api 0.10.0-dev
|   |   ├── frame-support 4.0.0-dev
|   |   ├── frame-executive 4.0.0-dev
|   |   └── data-avail 1.0.0
|   └── sc-tracing 4.0.0-dev
└── sc-tracing 4.0.0-dev
├── sc-telemetry 4.0.0-dev
|   ├── sc-service 0.10.0-dev
|   ├── sc-finality-grandpa 0.10.0-dev
|   ├── sc-consensus-slots 0.10.0-dev
|   ├── sc-consensus-babe 0.10.0-dev
|   ├── sc-consensus-aura 0.10.0-dev
|   ├── sc-cli 0.10.0-dev
|   ├── sc-chain-spec 4.0.0-dev
|   ├── sc-basic-authorship 0.10.0-dev
|   └── data-avail 1.0.0
└── sc-cli 0.10.0-dev
└── frame-benchmarking-cli 4.0.0-dev
```

#### Unmaintained dependencies:

\begin{center} \begin{tabular}{||l|p{2cm}|p{9cm}|} \hline \textbf{ID} & \textbf{package} & \textbf{Short Description} \\ \hline \ href{https://rustsec.org/advisories/RUSTSEC-2020-0016}{RUSTSEC-2020-0016} & net2 0.2.37 & **net2** crate has been deprecated; use **socket2** instead \\ \ href{https://rustsec.org/advisories/RUSTSEC-2021-0127}{RUSTSEC-2021-0127} & serde-cbor 0.11.2 & serde-cbor is unmaintained \\ \end{tabular} \end{center}

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Halborn strongly recommends conducting a follow-up assessment of the project either within six months or immediately following any material changes to the codebase, whichever comes first. This approach is crucial for maintaining the project's integrity and addressing potential vulnerabilities introduced by code modifications.