Quantstamp

Obol

Executive Summary

This audit report was prepared by Quantstamp, the leader in blockchain security.

Type	Distributed Validator Technology
Timeline	2023-11-20 through 2023-12-19
Language	Go
Methods	Architecture Review, Computer-Aided Verification, Manual Review
Specification	Charon Client
Source Code	• ObolNetwork/charon #67725e4 • ObolNetwork/charon #3e12d09
Auditors	• Jeffrey Kam Auditing Engineer • Michael Boyle Auditing Engineer • Pavel Shabarkin Senior Auditing Engineer

Documentation quality	Medium
Test quality	Medium
Total Findings	18 Fixed: 7 Acknowledged: 8 Mitigated: 3
High severity findings	3 Fixed: 3
Medium severity findings	3 Fixed: 2 Mitigated: 1
Low severity findings	7 Fixed: 1 Acknowledged: 4 Mitigated: 2
Undetermined severity findings	0
Informational findings	5 Fixed: 1 Acknowledged: 4

Summary of Findings

The Charon client is Obol's implementation of DVT (Distributed Validator Technology) for the Ethereum blockchain. Charon is a Golang-based HTTP middleware that enables any existing Ethereum validator clients to operate together as part of a distributed validator. Multiple Charon clients are configured to communicate together to come to a consensus on validator duties and behave as a single unified proof-of-stake validator together.

The main objective of this assessment was to evaluate risks related to slashing, downtime, and security of the private key management. The assessment was time-constrained and was not aimed to be a full security review therefore, it does not provide any security guarantees.

Our assessment revealed three high- and three medium-severity issues. The monitoring service could expose sensitive information such as memory addresses, through stack traces and memory allocations in the heap. In addition, this service could lead to a Denial of Service attack. In addition, during in-the-wild exploration, we have confirmed that public relays had this service exposed.

The review of the codebase also showed that debugging is not finished yet, and the implementation depends on Golang's panics. The Obol team fixed reachable panics identified by the Quantstamp team in OBO-2. Some of the panics are not handled to recover the crashed execution flow, although these situations are unlikely to occur under normal operating conditions. Nonetheless, there exists a risk of potential Denial of Service (DoS) scenarios under abnormal circumstances.

The development team has been professional and helpful throughout the assessment. The project is still in an ongoing development phase; changes to the codebase were done during the security assessment to support the Deneb hardfork, while at the initial review the codebase had more than 50 "TODO" code comments. The Obol team addressed and removed old "TODO" items during the fix review. Consult OBO-15 for the full update.

Generally, the Charon client extends the attack surface on the validator server. This solution introduces additional entry points for external attackers and allows third parties to connect to the server, processing their messages as a standard part of operations. However, the Charon P2P port requires the identity key of a whitelisted peer.

Since the protocol is still in active development, running this software without appropriate network restrictions and secure host and setup configurations could pose a security risk to a validator. The security of this protocol warrants careful attention, as it stands as an underlying technology for operator validation duties.

The public Obol API (Launchpad) and usage of public relays pose DV clusters with security risks and could be a single point of failure. Operators should deploy and establish connections through their private relays and also use private launchpads or CLI commands to mitigate risks of single points of failure. Further points of centralization can be considered and mitigated with the documentation here.

As for improving the project itself, we highly recommend extensively testing the code, considering more edge cases, more in-the-wild testing on test networks, and having a full security audit to complement this time-boxed security assessment of the protocol before going to production. Also, continuous on-chain observation and revision of the code based on real-time observation are recommended.

During the fix review phase Obol team addressed and fixed all the high- and medium-severity findings. After the fix review, the Quantstamp team evaluated areas of the code only related to the fixes of the findings.

ID	DESCRIPTION	SEVERITY	STATUS
OBO-1	DoS Through Publicly Exposed `pprof` Utility	High	Fixed
OBO-2	Intentionally Induced Panic Could Lead to DoS of Charon Client	High	Fixed
OBO-3	Malicious Node Can Force Any Remote Peer Sign P2P Message	High	Fixed
OBO-4	DoS of the DKG Ceremony, Sync Step Is Not Constrained	Medium	Fixed
OBO-5	Keymanager Post Keys in Plain-Text	Medium	Mitigated
OBO-6	Deployable Deadcode of the Leadercast Consensus	Medium	Fixed
OBO-7	Charon Nodes Discovery Through Public Relays	Low	Acknowledged
OBO-8	Connection in Plain-Text Is Possible	Low	Mitigated
OBO-9	Allowlist and Denylist Are Not Used by the P2P Package	Low	Mitigated
OBO-10	Vulnerable Dependencies in Use	Low	Fixed
OBO-11	Leader Selection in QBFT Consensus Is Highly Predictable	Low	Acknowledged
OBO-12	Possible Downtime Under Normal Operation Even with a Supermajority of Honest Nodes	Low	Acknowledged
OBO-13	Unhandled Panic Statements	Low	Acknowledged
OBO-14	Missing Security Check in The `validateMsg()`	Informational	Acknowledged
OBO-15	Presence of Numerous `TODO` Comments	Informational	Acknowledged
OBO-16	Consensus Threshold Can Be Inconsistent with Signature Threshold	Informational	Acknowledged
OBO-17	Signer Component Is Deprecated in the Codebase	Informational	Acknowledged
OBO-18	Business Logic Inconsistency Within the Loop	Informational	Fixed

Assessment Breakdown

This assessment was conducted by the Quantstamp team primarily to estimate risks associated with insuring distributed validator technology. The assessment was time-constrained and does not offer any security guarantees. Quantstamp's objective was to evaluate the repository for issues related to slashing, downtime, and security of private key management.

Disclaimer

Only features that are contained within the repositories at the commit hashes specified on the front page of the report are within the scope of the audit and fix review. All features added in future revisions of the code are excluded from consideration in this report.

Possible issues we looked for included (but are not limited to):

- Integer overflow / underflow
- Number rounding errors
- Denial of service / logical oversights
- Authentication / authorization
- Client / server synchronization
- Potential slashing occurrences
- Private key management and leakage
- Consensus splits
- Invalid incoming messages
- Falsified messages
- Replay attacks
- Business logic contradicting the specification
- Code clones, functionality duplication
- Data integrity loss
- Injection type attacks
- Remote code execution
- Vulnerable software in use

Methodology

1. Code review that includes the following
    1. Review of the specifications, sources, and instructions provided to Quantstamp to make sure we understand the size, scope, and functionality of the Charon client code.
    2. Manual review of code, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
    3. Comparison to specification, which is the process of checking whether the code does what the specifications, sources, and instructions provided to Quantstamp describe.
2. Best practices review, which is a review of the Golang code to improve efficiency, effectiveness, clarity, maintainability, security, and control based on the established industry and academic practices, recommendations, and research.
3. Specific, itemized, and actionable recommendations to help you take steps to secure your code.

Scope

This security assessment only focuses on the Charon client. It assumes that everything other than the files in the specified folder, including the used libraries, dependencies, cryptography algorithms, etc, is working correctly and as intended.

Findings

OBO-1 DoS Through Publicly Exposed `pprof` Utility

High Fixed

Update
Obol team removed the default deployment of `pprof` endpoint for monitoring API and relay.

File(s) affected: `app/monitoringapi.go`

Description: The Charon client hosts 3 network services, where `:3620` port exposes sensitive information to the public access :

- `:3600` - Validator REST API
- `:3610` - Charon P2P
- `:3620` - Monitoring service

The web API service is hosted on port `:3620` that serves prometheus metrics on `/metrics`, a readiness endpoint on `/readyz`, a liveness endpoint on `/livez`, and a pprof server on `/debug/pprof`. The `/debug/pprof` API server could give access to the sensitive information of the charon client through different types of profiles:

- **allocs:** A sampling of all past memory allocations
- **block:** Stack traces that led to blocking on synchronization primitives
- **cmdline:** The command line invocation of the current program
- **goroutine:** Stack traces of all current goroutines. Use debug=2 as a query parameter to export in the same format as an unrecovered panic.
- **heap:** A sampling of memory allocations of live objects. You can specify the gc GET parameter to run GC before taking the heap sample.
- **mutex:** Stack traces of holders of contended mutexes
- **profile:** CPU profile. You can specify the duration in the seconds GET parameter. After you get the profile file, use the go tool pprof command to investigate the profile.
- **threadcreate:** Stack traces that led to the creation of new OS threads
- **trace:** A trace of execution of the current program. You can specify the duration in the seconds GET parameter. After you get the trace file, use the go tool trace command to investigate the trace.

Through this service, there is a potential risk of an attacker retrieving memory addresses of the charon client and relay. Moreover, an exposed `/debug/pprof` endpoint in a Go application can indeed be a vector for a Denial of Service (DoS) attack, although it's not the most

straightforward or common method for such an attack. The primary risk associated with an exposed `pprof` endpoint is the unintended disclosure of sensitive information and details about the application's internal workings. However, it can also impact the application's performance, because of the potential for a DoS attack. The additional load and resource consumption caused by accessing these profiles can lead to a reduced performance of the application, potentially leading to a DoS condition under certain circumstances.

The documentation advises that this port should never be made public; however, the current build, along with the default settings, does not safeguard against its exposure to the public internet. The `https://0.relay.obol.tech/` is a default public relay. A DoS attack against the default relay could prevent other DVT clients from identifying other peers in the cluster. An example of an active instance can be found at `http://35.204.189.73:3620/debug/pprof/`.

Reference to the similar issue: https://github.com/kubernetes/kubernetes/issues/81023

Recommendation: Remove the `/debug/pprof` from production build or make this service by default non-deployable.

OBO-2 Intentionally Induced Panic Could Lead to DoS of Charon Client

High Fixed

Update

1. **core/tracing.go:safeInt64():**

   Obol team implemented the string parsing of integer value with the help of `strconv.FormatUint()` function. The `safeInt64()` function was removed.
2. **core/proto.go:ParSignedDataFromProto():**

   Obol team implemented the `defer { recover() }` function in the `ParSignedDataFromProto()` function that should catch any of the panics.
3. **eth2util/rlp/rlp.go:decodeLength():**

   Obol team removed `panic()` function from the `decodeLength()` function

File(s) affected: `core/tracing.go:safeInt64()`, `core/proto.go:ParSignedDataFromProto()`, `eth2util/rlp/rlp.go:decodeLength()`

Description: The analysis of `panic()` usage within the codebase reveals that the Charon client is significantly reliant on panics, and not all of these panics are recoverable. This susceptibility could result in the Charon client program crashing, subsequently leading to downtime. If the Charon client becomes widely adopted within the Ethereum staking ecosystem to the extent that it is running >33% of all validators, a large-scale intentional DoS attack could trigger an 'inactivity leak' mode. In such a scenario, each instance of node downtime would incur severe penalties. We have identified several instances, though not exhaustively, where such a scenario could potentially be initiated by an external, whitelisted, cluster counterparty:

1. **core/tracing.go:safeInt64():** The `'/charon/parsigex/2.0.0'` P2P handler is employed to receive and broadcast partial signatures to all connected peers. However, this functionality exposes a vulnerability where any remote peer, can cause a Charon client to crash due to unrecoverable panics. Specifically, when the handler initiates the tracing procedure for a duty, the duty's slot value is processed by the `safeInt64()` function. This function will panic if the slot value exceeds the maximum limit of the `int64` type. A malicious remote node could exploit this by intentionally sending a `duty.Slot` value higher than the positive range of the `int64` type, triggering a panic as it fails the validation check. `uint64` range: [0 - 18446744073709551615] when `int64` range [-9223372036854775808 - 9223372036854775807].
2. **core/proto.go:ParSignedDataFromProto():** According to the specifications, the `ParSignedDataFromProto()` function may panic due to unexpected data encountered during JSON unmarshalling. This function is used within the `'/charon/parsigex/2.0.0'` P2P handler and is invoked prior to validating the caller's authentication. Consequently, a malicious node could craft a message that disrupts the JSON unmarshalling process, causing the program to panic and crash.
3. **eth2util/rlp/rlp.go:decodeLength():** The Charon client conducts host discovery by parsing peers' ENRs obtained from the trusted relay. During this process, if an ENR string, decoded using the `eth2util/enr/enr.go:Parse()` function, exceeds 255 (0xf7 + 8) bytes, the Charon client will panic. Consequently, if the relay hosts ENR strings larger than 255 bytes, all Charon clients attempting to parse these strings will crash.

Recommendation: Implement recover mechanisms to handle errors and prevent intentional Charon client crashes.

OBO-3 Malicious Node Can Force Any Remote Peer Sign P2P Message

High Fixed

Update

Obol team changed the logic of signing. Instead of passing the hash of the message to sign, they are passing a message and hash it before signing. This prevents the attack vector of passing any hash for signing, even outside of Charon client usage.

File(s) affected: `dkg/bcast/server.go`

Description: During the execution of the DKG ceremony by peers in the cluster, the DKG package deploys several P2P handlers to manage incoming messages from other peers. The exact function of the '/charon/dkg/bcast/1.0.0/sig' handler (handleSigRequest()) remains unclear to us. However, it appears that any whitelisted peer, can submit a unique message `Id` and `Hash`, and the receiving peer will sign the submitted hash with their private identity key and respond with the signed signature back to the sender.

An attacker can exploit this functionality and use in several places of Charon client:

- An attacker could strategically precompute hashes of malicious messages intended for a future QBFT consensus rounds, then coerce a peer into signing them via the '/charon/dkg/bcast/1.0.0/sig' handler within the time of DKG process. When the time for the QBFT consensus phase arrives, the attacker could replay these messages, seemingly originating from other peers. This tactic could potentially lead to a falsified consensus.
- Additionally, during the Frost DKG process, an attacker could impersonate other peers by sending cast messages on behalf of other peers to modify their commitments. This scenario would enable an attacker to gain control over a number of shares exceeding the required threshold, ultimately allowing them to reconstruct the private signing key.

The main idea behind the impact for this finding that an attacker can force any peer during the DKG process to sign arbitrary hash and retrieve its valid signature. This breaks every authentication mechanism where it is relied on private identity key (multiple handlers of the Charon client). Moreover, if the private identity key is associated with funds external to the Charon client, there is a risk that these funds could be vulnerable to unauthorized access and potential depletion.

Recommendation: Remove the '/charon/dkg/bcast/1.0.0/sig' handler. Or accept message instead of hash and validate its content before signing.

OBO-4 DoS of the DKG Ceremony, Sync Step Is Not Constrained

Medium Fixed

Update

The Obol team changed `setStep()` to `updateStep()` function and applied checks which verify that step is increasing monotonically one by one.

File(s) affected: `dkg/sync/server.go`

Description: During the DKG ceremony every remote peer should set a step to synchronize between each other. In the current implementation of `setStep()` function, remote peer can provide any value and it will be accepted by the receiving peer. No validation is implemented. Inside the `startSyncProtocol()` function, there is actual implementation of this synchronization mechanism. When all the remote peers are connected to the peer with ongoing execution, then `startSyncProtocol()` function initializes the inline `stepSyncFunc()` function to step synchronically with all the peers.

The server.AwaitAllAtStep() function makes sure that remotely connected peers are at the same step. If any remote peer is two steps ahead, then isAllAtStep() function returns error and breaks the DKG Ceremony. When remote node sets step its values is stored in the `s.steps` mapping.

In the current implementation of `handleStream()` function, only a whitelisted node with a valid libp2p setup can send a message to the peer and their step will be counted. An attacker as a whitelisted peer could connect to any peer from the cluster and declare an arbitrarily large step, and when the other peers go through the synchronization process, it will never finish. This could intentionally or unintentionally block the entire DKG ceremony.

Recommendation: Implement validation of the `step` parameter in the `setStep()` function or revise the function which increments `step` every time when specific peer sends the message.

OBO-5 Keymanager Post Keys in Plain-Text

Medium Mitigated

Update

Obol team implemented the log warning if the keymanager is connected via HTTP rather than HTTPS protocol.

Update

The client provided the following explanation:

We cannot simply enforce HTTPS requirements for any keymanager address, because we have to support use cases like docker networks. However, we made an improvement and logged a warning in case we detected the missing https scheme. We're also planning to move to url.ParseRequestURI through the codebase in order to validate URLs better: https://github.com/ObolNetwork/charon/issues/2796 PR: https://github.com/ObolNetwork/charon/pull/2795

File(s) affected: `eth2util/keymanager/keymanager.go`

Description: The `postKeys()` function fails to verify the protocol used for uploading encrypted keys and passwords. To mitigate the risk of local eavesdropping and the potential leakage of keys and passwords in the KeyManager's web server logs, uploads should be conducted via HTTPS (over SSL).

Recommendation: Host the KeyManager on a server configured with SSL, and ensure within the Charon client that connections are established using SSL.

OBO-6 Deployable Deadcode of the Leadercast Consensus

Medium Fixed

Update

The Obol team removed from Leadercast component from the code.

File(s) affected: `core/leadercast/transport.go`

Description: The Charon client codebase consisted both deployable QBFT and Leadercast consensus mechanisms at the same time. Any dead code especially reachable for the external entity could be used in a malicious way and lead to unexpected results. The Obol team has addressed this issue by eliminating this consensus mechanism. As part of their development roadmap, they have transitioned to the QBFT consensus

Recommendation: Remove any code related to the Leadercast consensus component.

OBO-7 Charon Nodes Discovery Through Public Relays

Low | Acknowledged

Update

Marked as "Acknowledged" by the client. The client provided the following explanation:

Acknowledged. No actions taken. The documentation states the associated risks. The users concerned about their privacy can refrain from using public relay and deploy a self-hosted relay and conduct discovery exclusively through this channel.

File(s) affected: `https://0.relay.obol.tech/`

Description: Public Relays operated by the Obol team might reveal the IP addresses of clients who do not use private (self-hosted) relays. If this vulnerability is exploited, an attacker could potentially identify a significant portion of the Charon clients and execute targeted attacks against them. This observation is intended to underscore the risk associated with being identified due to the use of public relays. Obol team is aware about this and other risks and define them in their documentation.

Recommendation: Refrain from using public relays. Instead, deploy a private relay and conduct peer-to-peer discovery exclusively through this channel.

OBO-8 Connection in Plain-Text Is Possible

Low | Mitigated

Update

The client provided the following explanation:

We added warnings to the associated code paths.

However, considering that we need to support docker network cases where using http is normal practice. Therefore we cannot require only https schemes for the urls. PR: https://github.com/ObolNetwork/charon/pull/2813

File(s) affected: `dkg/disk.go`, `p2p/bootnode.go`

Description: When the Charon client loads the cluster definition using the `loadDefinition()` function, it validates the connecting URL through `validURI()`, which permits connections via the plaintext HTTP protocol. In the `NewRelays()` function Charon client permits plain-text connections to the relay: `if strings.HasPrefix(relayAddr, "http") {}`

Recommendation: Permit connections exclusively through the secure HTTPS protocol

OBO-9 Allowlist and Denylist Are Not Used by the P2P Package

Low | Mitigated

Update

The client provided the following explanation:

Confirmed that the following values are not used anywhere in the code. Having these flags without using them is confusing for the user and can set false expectations. The Protocol team has removed these flags, and will consider re-introducing them in future if needed. PR: https://github.com/ObolNetwork/charon/pull/2801

Update

Obol team removed IP Allowlist and Denylist from the implementation.

File(s) affected: `p2p/config.go`, `cmd/run.go`

Description: In the command line, we can specify a list of CIDR subnets that are allowed (or denied) from peer connections. This information is then stored in the `Config` object by `p2p/config.go`. However, this is not used anywhere in the codebase.

```
cmd.Flags().StringVar(&config.Allowlist, "p2p-allowlist", "", "Comma-separated list of CIDR subnets for allowing only certain peer connections. Example: 192.168.0.0/16 would permit connections to peers on your local network only. The default is to accept all connections.")
```

```
cmd.Flags().StringVar(&config.Denylist, "p2p-denylist", "", "Comma-separated list of CIDR subnets for disallowing certain peer connections. Example: 192.168.0.0/16 would disallow connections to peers on your local network. The default is to accept all connections.")
```

Recommendation: Confirm whether this is intended. If not, consider implementing the features or removing them, and update the documentation accordingly.

OBO-10 Vulnerable Dependencies in Use

Low Fixed

Update

Marked as "Fixed" by the client. The client provided the following explanation:

The team acknowledges this point and reviewed the dependencies in use, updating them as needed. We reviewed the dependencies listed by Nancy ourselves, and noticed that the only remaining dependency with an issue is btcec. That specific dependency comes from Kryptology, which we only use for their FROST implementation. The reported CVE affects Bitcoin message handling: Charon will never reach those code paths. The Obol team has been working in conjunction with the Nethermind research team, and we aim to replace Kryptology completely soon, entirely removing the dependency on btcec. Until then we will not replace this vulnerable dependency due to the requirement to refactor Kryptology to handle a change to the btcec library introduced in btcec v2.

Description: By running Nancy dependency checker we identified that codebase used several vulnerable dependencies. Note, due to the vulnerable libraries being an indirect dependency to Charon, it is unclear whether it is directly exploitable in the codebase. There is a list of them:

- github.com/consensys/gnark-crypto@0.12.0; CVE
- pkg:golang/github.com/btcsuite/btcd@v0.22.3; CVE-2022-44797
- pkg:golang/github.com/hashicorp/consul/api@v1.25.1; CVE-2022-29153
- pkg:golang/github.com/microcosm-cc/bluemonday@v1.0.1; CVE-2021-42576
- pkg:golang/github.com/nats-io/nkeys@v0.4.5; CVE-2023-46129

Recommendation: Update the external libraries and dependencies to up-to-date versions which mitigates flagged issues.

OBO-11 Leader Selection in QBFT Consensus Is Highly Predictable

Low Acknowledged

Update

Marked as "Acknowledged" by the client. The client provided the following explanation:

Indeed the leader selection function is deterministic, the team is aware of this. This is a requirement of the QBFT protocol (originally named IBFT 2.0, extending the original IBFT paper), all participants must be able to deterministically calculate the correct leader at all times using only an accurate clock and knowledge of the initial conditions. . In future, the Obol team may look at other consensus protocols that do not have predictable leader elections, for now, there is no action to take with respect to this finding.

File(s) affected: `core/consensus/component.go`, `core/qbft/qbft.go`

Description: The leader selection function is defined by the following function in `core/consensus/component.go` as follows:

```
func leader(duty core.Duty, round int64, nodes int) int64 {
    return (int64(duty.Slot) + int64(duty.Type) + round) % int64(nodes)
}
```

This approach is highly predictable, primarily because the duty slot deterministically increments by one each time, and certain duty types occur more frequently than others (e.g., attestation vs proposal, as detailed in this document). For instance, if a malicious actor aims to launch a DOS attack on the servers, they have a much higher probability to guess the involved nodes and subsequently target them. Specifically, this predictability greatly increases the likelihood of an attacker successfully crippling the system by focusing on nodes with consecutive indices. In scenarios where not all nodes in the cluster are trusted, introducing more randomness into the leader selection process could significantly help mitigate this potential DOS vulnerability.

Recommendation: Determine if the highly predictable nature of leader selection is acceptable. If not, consider implementing a mechanism that achieves fairness, uniqueness, and unpredictability.

OBO-12
Possible Downtime Under Normal Operation Even with a Supermajority of Honest Nodes

Low | Acknowledged

Update

Marked as "Acknowledged" by the client. The client provided the following explanation:

The `increasingRoundTimeout` mode defines the timeout as follows:

```
func increasingRoundTimeout(round int64) time.Duration {
       return incRoundStart + (time.Duration(round) * incRoundIncrease)
}
```

For round 1 the duration will be 1 second, while for each next round the timeout will be incremented by 250ms. Partially synchronous, turn based consensus games will take longer the more faulty nodes you add, and the ethereum spec does only allow fixed durations to produce duties, this is a tradeoff you have to make.

File(s) affected: `core/consensus/component.go`, `core/qbft/qbft.go`

Description: The consensus has a timeout mechanism that helps with leader rotation, in the case of a malicious leader stalling the group from reaching consensus. When a timeout happens, it triggers a round change. By default, the consensus client uses the increasingRoundTimeout mode. For the first round, it has a timeout of "1 second", and then for any subsequent round, the timeout increases by "250 milliseconds".

Since each slot is "12 seconds", there is an upper bound of how many malicious (or just offline) nodes the system can tolerate, even when there are more than a quorum number of honest nodes. To be specific, if there are more than 21 nodes in the cluster and there are 7 offline nodes (7 consecutive timeouts will take 12.25 seconds), the validator may miss its duty (i.e. proposal or attestation) simply because of the time it takes to reach consensus. This is made worse by the fact that leader selection is highly predictable because then the attacker only needs to launch an attack on a small specific subset of nodes to cause system downtime.

Recommendation: This is by nature of the consensus protocol. However, having more empirical data on the consensus latency and perhaps a tool to help gather these timing statistics can help potential users better understand the risks of potential downtime and choose its cluster size correspondingly.

OBO-13 Unhandled Panic Statements

Low | Acknowledged

Update

Marked as "Acknowledged" by the client. The client provided the following explanation:

In general, there are two operational models for a server application: a) Exit the process when panic occurs, properly unwinding the stack and releasing any locks. Then the orchestration software is in charge to restart the application. This works great for microservices or for applications that have limited external connections, e.g. database. b) Recover on any panic and keep the application running, reconnecting to external services as needed. As discussed within the Protocol team, Charon employed the first model. Therefore some panics can be valid if we expect to not proceed with the operation and are willing to exit the process. The first three cases were fixed in OBO-2. We have also verified all other instances. None of them should never happen in normal operation and are added as invariants and are extra safety checks in case of something extremely unexpected occurring, where the assumption is that a complete fatal end to the execution of the program is preferable to continuing.

File(s) affected: `See the Description`

Description: The application's current codebase makes extensive use of `panic` statements for error handling. This approach is not recommended for production-ready code, as it leads to abrupt program termination, poor error context, and reduced application reliability. Below are some of the files that contains `panic` statements.

File(s):

- eth2wrap.go
- types.go
- select.go
- manager.go
- api.go
- eip712sigs.go
- createdkg.go
- signeddata.go
- tracing.go
- memory.go
- qbft.go
- options.go
- server.go

Recommendation: Consider handling all instances of `panic` statements that can occur during the runtime of Obol. This is especially important if the `panic` can be triggerred by a peer or attacker.

OBO-14 Missing Security Check in The `validateMsg()`

Informational | Acknowledged

> **Update**
> Marked as "Acknowledged" by the client. The client provided the following explanation:
>
> The consensus code checks each and every message for validity here. While it is true that the `validateMsg()` function does nothing, it must be noted that this is nothing more than a small tech debt, which we'll address soon.

File(s) affected: `consensus/transport.go`

Description: In the QBFT consensus component incoming messages are validated through `validateMsg()` function, however in the current implementation the function logic in empty.

Recommendation: Implement logic for message validation.

OBO-15 Presence of Numerous `TODO` Comments

Informational | Acknowledged

> **Update**
> Marked as "Acknowledged" by the client. The client provided the following explanation:
>
> We removed unimportant, old TODO items in these PRs:
>
> - https://github.com/ObolNetwork/charon/pull/2915
> - https://github.com/ObolNetwork/charon/pull/2914
> - https://github.com/ObolNetwork/charon/pull/2911
> - https://github.com/ObolNetwork/charon/pull/2903
> - https://github.com/ObolNetwork/charon/pull/2900
> - https://github.com/ObolNetwork/charon/pull/2899
> - https://github.com/ObolNetwork/charon/pull/2809
>
> None of the items the team found were considered high-risk security-wise. None of the TODO items that could be found in the audited Charon version are of concern for the stability or production readiness of the codebase.

Description: The Charon client codebase continains numerous 'TODO' comments, some of them in areas related to security. This may indicate that the product still requires further development before it can be considered production-ready.

Recommendation: We highly recommend reviewing all outstanding TODO comments, and completing all the key features outlined in the developer roadmap, followed by a comprehensive security review of the finished product.

OBO-16 Consensus Threshold Can Be Inconsistent with Signature Threshold

Informational | Acknowledged

> **Update**
> Marked as "Acknowledged" by the client. The client provided the following explanation:
>
> Acknowledged and not changed. On occasion, software users have expressed interest in setting the private key threshold to either be more restrictive than the minimum safe threshold (in cases of low trust among node operators), as well as more lax than the safe threshold (in case of private key share loss by node operators). We do not encourage either, and set the minimal safe default both in the user interface and with the command line interface. We document the safe threshold values under crash fault tolerant and byzantine fault tolerant situations here.

File(s) affected: `core/qbft/qbft.go`, `cmd/createdkg.go`

Description: The consensus protocol requires a quorum of nodes to be honest in order to reach consensus, namely `2n/3` where `n` is the number of nodes. However, it is possible to set the DKG threshold to be lower than this. This is not possible through the normal flow because, to create the cluster on the Obol's frontend, it automatically sets the threshold to be exactly the default threshold (i.e. same as `quorum`). However, it is technically possible to create cluster definitions manually that have a lower threshold. Because consensus must be reached first before duty data are signed (with partial keys) and broadcasted to each other, there is a logical lower bound to the threshold. While there is logging if the threshold is different from the default value, the lower bound is not enforced in the codebase.

```
func runCreateDKG(ctx context.Context, conf createDKGConfig) (err error) {
    ...
```

```
    safeThreshold := cluster.Threshold(len(conf.OperatorENRs))
    if conf.Threshold == 0 {
        conf.Threshold = safeThreshold
    } else if conf.Threshold != safeThreshold {
        log.Warn(ctx, "Non standard `--threshold` flag provided, this will affect cluster safety", nil,
z.Int("threshold", conf.Threshold), z.Int("safe_threshold", safeThreshold))
    }
    ...
}
```

Similarly, in `cmd/createcluster.go`, we have

```
func safeThreshold(ctx context.Context, numNodes, threshold int) int {
    safe := cluster.Threshold(numNodes)
    if threshold == 0 {
        return safe
    }
    if threshold != safe {
        log.Warn(ctx, "Non standard threshold provided, this will affect cluster safety", nil,
            z.Int("num_nodes", numNodes), z.Int("threshold", threshold), z.Int("safe_threshold", safe))
    }

    return threshold
}
```

Recommendation: When the threshold is less than `safe`, it should return an error instead of just logging a warning.

OBO-17 Signer Component Is Deprecated in the Codebase

Informational · Acknowledged

> **Update**
> Marked as "Acknowledged" by the client. The client provided the following explanation:
>
> The team will go through the documentation and double-check for Signer component mentions.

File(s) affected: `docs/architecture.md`, `core/interface.go`

Description: In `docs/architecture.md`, the architecture overview diagram mentions an internal `Signer` component that is responsible for interacting with the external `Remote Signer` component. However, this internal `Signer` component does not exist in the codebase. In the section `Stitching the core workflow` of the documentation, it also mentions that the `Signer.sign` function is subscribed to the consensus client. However, this is not shown in `core/interface.go`, the file that wires the core workflow together.

Recommendation: Confirm whether the component is now deprecated and update the documentation accordingly.

OBO-18 Business Logic Inconsistency Within the Loop

Informational · Fixed

> **Update**
> Obol team moved the `db.resolveContribQueriesUnsafe()` function outside the loop.

> **Update**
> Marked as "Fixed" by the client. The client provided the following explanation:
>
> Fixed in PR: https://github.com/ObolNetwork/charon/pull/2800

File(s) affected: `core/dutydb/memory.go`

Description: While exploring the functionality of DutyDB, we identified an inconsistency in the code that could potentially lead to unexpected issues, although this was not manually verified by code inspection.

When peers reach consensus, each peer stores the duty value in DutyDB using the `Store()` function. If the duty type is `DutySyncContribution`, the data is prepared and stored in mappings, and this data is then resolved within the same `for ... range` loop. In contrast, for all other duty types, data resolution occurs right after the `for ... range` loop.

In the `resolveContribQueriesUnsafe()` function each prepared data query is then sent to the 'Response' channel. During the `resolveContribQueriesUnsafe()` function's loop execution, it sends to the channel every contribution that has yet to be resolved. Thus, even though the `resolveContribQueriesUnsafe()` function could be executed in the `for ... range` loop for the `core.DutySyncContribution` case, for consistency and more predictable results, it would be better to align this logic with the implementation used for other duty types.

Recommendation: Move `db.resolveContribQueriesUnsafe()` right after `for ... range` loop.

Definitions

- **High severity** – High-severity issues usually put a large number of users' sensitive information at risk, or are reasonably likely to lead to catastrophic impact for client's reputation or serious financial implications for client and users.
- **Medium severity** – Medium-severity issues tend to put a subset of users' sensitive information at risk, would be detrimental for the client's reputation if exploited, or are reasonably likely to lead to moderate financial impact.
- **Low severity** – The risk is relatively small and could not be exploited on a recurring basis, or is a risk that the client has indicated is low impact in view of the client's business circumstances.
- **Informational** – The issue does not post an immediate risk, but is relevant to security best practices or Defence in Depth.
- **Undetermined** – The impact of the issue is uncertain.
- **Fixed** – Adjusted program implementation, requirements or constraints to eliminate the risk.
- **Mitigated** – Implemented actions to minimize the impact or likelihood of the risk.
- **Acknowledged** – The issue remains in the code but is a result of an intentional business or design decision. As such, it is supposed to be addressed outside the programmatic means, such as: 1) comments, documentation, README, FAQ; 2) business processes; 3) analyses showing that the issue shall have no negative consequences in practice (e.g., gas analysis, deployment settings).

Toolset

The notes below outline the setup and steps performed in the process of this audit.

Setup

Tool Setup:

- Nancy 1.0.45
- GoSec 2.18.2
- CodeQL 2.15.3

Steps taken to run the tools:

- Set up the brew tap: `brew tap sonatype-nexus-community/homebrew-nancy-tap`
- Install Nancy: `brew install nancy`
- Run Nancy against all modules: `go list -m all | nancy`
  - Install gosec: go get github.com/securego/gosec/cmd/gosec
  - run gosec againt all modules: gosec ./...

The setup and usage of this tool is available in the official documentation

Automated Analysis

Nancy

While the majority of the results were false positives, we manually reviewed all credible issues and have included them as specific findings in the report.

GoSec

While the majority of the results were false positives, we manually reviewed all credible issues and have included them as specific findings in the report.

CodeQL

While the majority of the results were false positives, we manually reviewed all credible issues and have included them as specific findings in the report.

Test Suite Results

Our team executed the test suite of Charon on commit `67725e465598114362188ddaaeefef96eb260877` and we report that all tests have passed. The detailed output including coverage of statements is visible below. The following command was used:

```
go test $(go list ./... | grep -v testutil)  -failfast -v -coverprofile=coverprofile-complete
```

We also note that integration tests are disabled by default, and can be executed with the following command:

```
go test -v -timeout=90m -race github.com/obolnetwork/charon/testutil/integration -nightly
```

Fuzz testing is implemented and can be executed with:

```
go test -race github.com/obolnetwork/charon/testutil/compose/fuzz -v -fuzzer -sudo-perms -timeout=45m -
log-dir=.
```

Note that we recommend using a different stopping criterion than a 45 minute timeout to ensure that a larger part of the code base is exercised by the fuzzer.

```
    github.com/obolnetwork/charon       coverage: 0.0% of statements
    github.com/obolnetwork/charon/app/eth2wrap/genwrap      coverage: 0.0% of statements
    github.com/obolnetwork/charon/app/genssz        coverage: 0.0% of statements
=== RUN   TestSlotFromTimestamp
=== RUN   TestSlotFromTimestamp/goerli_slot0
=== RUN   TestSlotFromTimestamp/goerli_slot1
=== RUN   TestSlotFromTimestamp/sepolia_slot0
=== RUN   TestSlotFromTimestamp/sepolia_slot1
=== RUN   TestSlotFromTimestamp/gnosis_slot0
=== RUN   TestSlotFromTimestamp/gnosis_slot1
=== RUN   TestSlotFromTimestamp/mainnet_slot0
=== RUN   TestSlotFromTimestamp/mainnet_slot1
--- PASS: TestSlotFromTimestamp (0.02s)
    --- PASS: TestSlotFromTimestamp/goerli_slot0 (0.01s)
    --- PASS: TestSlotFromTimestamp/goerli_slot1 (0.00s)
    --- PASS: TestSlotFromTimestamp/sepolia_slot0 (0.00s)
    --- PASS: TestSlotFromTimestamp/sepolia_slot1 (0.00s)
    --- PASS: TestSlotFromTimestamp/gnosis_slot0 (0.00s)
    --- PASS: TestSlotFromTimestamp/gnosis_slot1 (0.00s)
    --- PASS: TestSlotFromTimestamp/mainnet_slot0 (0.00s)
    --- PASS: TestSlotFromTimestamp/mainnet_slot1 (0.00s)
=== RUN   TestCalculateTrackerDelay
=== RUN   TestCalculateTrackerDelay/slow_slots
=== RUN   TestCalculateTrackerDelay/fast_slots
--- PASS: TestCalculateTrackerDelay (0.00s)
    --- PASS: TestCalculateTrackerDelay/slow_slots (0.00s)
    --- PASS: TestCalculateTrackerDelay/fast_slots (0.00s)
=== RUN   TestSetFeeRecipient
--- PASS: TestSetFeeRecipient (0.01s)
=== RUN   TestStartChecker
=== RUN   TestStartChecker/success
=== RUN   TestStartChecker/syncing
=== RUN   TestStartChecker/zero_BN_peers
=== RUN   TestStartChecker/BN_far_behind
=== RUN   TestStartChecker/too_few_peers
=== RUN   TestStartChecker/vc_not_connected
    monitoringapi_internal_test.go:172: Ignoring unexpected error, got=<nil>, want=vc not connected
=== RUN   TestStartChecker/vc_missing_validators
    monitoringapi_internal_test.go:172: Ignoring unexpected error, got=<nil>, want=vc missing validators
=== RUN   TestStartChecker/success#01
--- PASS: TestStartChecker (0.24s)
    --- PASS: TestStartChecker/success (0.04s)
    --- PASS: TestStartChecker/syncing (0.03s)
    --- PASS: TestStartChecker/zero_BN_peers (0.03s)
    --- PASS: TestStartChecker/BN_far_behind (0.03s)
    --- PASS: TestStartChecker/too_few_peers (0.02s)
    --- PASS: TestStartChecker/vc_not_connected (0.03s)
    --- PASS: TestStartChecker/vc_missing_validators (0.03s)
    --- PASS: TestStartChecker/success#01 (0.03s)
=== RUN   TestQBFTDebugger
--- PASS: TestQBFTDebugger (0.00s)
PASS
coverage: 15.1% of statements
ok      github.com/obolnetwork/charon/app   1.169s  coverage: 15.1% of statements
=== RUN   TestWithCtxErr
--- PASS: TestWithCtxErr (0.00s)
=== RUN   TestComparable
```

```
--- PASS: TestComparable (0.00s)
=== RUN   TestIs
--- PASS: TestIs (0.00s)
PASS
coverage: 80.8% of statements
ok      github.com/obolnetwork/charon/app/errors    0.377s  coverage: 80.8% of statements
=== RUN   TestMulti
=== RUN   TestMulti/cl1_only
=== RUN   TestMulti/cl2_only
=== RUN   TestMulti/ctx_cancel
=== RUN   TestMulti/cl1_error,_cl2_ok
=== RUN   TestMulti/all_error
=== RUN   TestMulti/cl1_error,_ctx_cancel
=== RUN   TestMulti/cl2_before_cl1
--- PASS: TestMulti (0.03s)
    --- PASS: TestMulti/cl1_only (0.01s)
    --- PASS: TestMulti/cl2_only (0.01s)
    --- PASS: TestMulti/ctx_cancel (0.00s)
    --- PASS: TestMulti/cl1_error,_cl2_ok (0.00s)
    --- PASS: TestMulti/all_error (0.00s)
    --- PASS: TestMulti/cl1_error,_ctx_cancel (0.00s)
    --- PASS: TestMulti/cl2_before_cl1 (0.00s)
=== RUN   TestSyncState
--- PASS: TestSyncState (0.00s)
=== RUN   TestErrors
=== RUN   TestErrors/network_dial_error
14:18:43.329 [31mERRO[0m [32m          [0m See this error log for fields: beacon api slots_per_epoch:
beacon api new eth2 client: network operation error: dial: connect: connection refused {"label":
"slots_per_epoch", "address": "localhost:22222"}
    app/eth2wrap/eth2wrap.go:356 .wrapError
    app/eth2wrap/eth2wrap.go:85 .func1
    app/eth2wrap/lazy.go:73 .getOrCreateClient
    app/eth2wrap/eth2wrap_gen.go:772 .SlotsPerEpoch
    app/eth2wrap/eth2wrap_gen.go:98 .func1
    app/forkjoin/forkjoin.go:195 .func2
=== RUN   TestErrors/http_timeout
14:18:43.331 [31mERRO[0m [32m          [0m See this error log for fields: beacon api slots_per_epoch:
beacon api new eth2 client: http request timeout: context deadline exceeded {"label": "slots_per_epoch",
"address": "http://127.0.0.1:52156", "url": "http://127.0.0.1:52156/eth/v1/beacon/genesis", "method":
"Get"}
    app/eth2wrap/eth2wrap.go:342 .wrapError
    app/eth2wrap/eth2wrap.go:85 .func1
    app/eth2wrap/lazy.go:73 .getOrCreateClient
    app/eth2wrap/eth2wrap_gen.go:772 .SlotsPerEpoch
    app/eth2wrap/eth2wrap_gen.go:98 .func1
    app/forkjoin/forkjoin.go:195 .func2
=== RUN   TestErrors/caller_cancelled
14:18:43.331 [31mERRO[0m [32m          [0m See this error log for fields: beacon api slots_per_epoch:
context canceled {"label": "slots_per_epoch"}
    app/eth2wrap/eth2wrap.go:359 .wrapError
    app/eth2wrap/eth2wrap_gen.go:105 .SlotsPerEpoch
    app/eth2wrap/eth2wrap_test.go:202 .func4
=== RUN   TestErrors/zero_net_op_error
14:18:43.333 [31mERRO[0m [32m          [0m See this error log for fields: beacon api genesis_time:
network operation error: : %!w(<nil>) {"label": "genesis_time", "address": "<nil>"}
    app/eth2wrap/eth2wrap.go:356 .wrapError
    app/eth2wrap/eth2wrap_gen.go:750 .GenesisTime
    app/eth2wrap/eth2wrap_test.go:217 .func5
=== RUN   TestErrors/eth2api_error
14:18:43.336 [31mERRO[0m [32m          [0m See this error log for fields: beacon api
signed_beacon_block: nok http response {"label": "signed_beacon_block", "status_code": 404, "endpoint":
"/eth/v2/beacon/blocks/123", "method": "GET", "data": "{\"code\":404,\"message\":\"NOT_FOUND: beacon
block at slot 123\",\"stacktraces\":[]}"}
    app/eth2wrap/eth2wrap.go:326 .wrapError
    app/eth2wrap/eth2wrap_gen.go:125 .SignedBeaconBlock
    app/eth2wrap/eth2wrap_test.go:238 .func6
--- PASS: TestErrors (0.01s)
    --- PASS: TestErrors/network_dial_error (0.00s)
    --- PASS: TestErrors/http_timeout (0.00s)
    --- PASS: TestErrors/caller_cancelled (0.00s)
    --- PASS: TestErrors/zero_net_op_error (0.00s)
    --- PASS: TestErrors/eth2api_error (0.00s)
```

```
=== RUN   TestCtxCancel
--- PASS: TestCtxCancel (0.04s)
=== RUN   TestBlockAttestations
--- PASS: TestBlockAttestations (0.00s)
=== RUN   TestOneError
--- PASS: TestOneError (0.01s)
=== RUN   TestOneTimeout
--- PASS: TestOneTimeout (0.00s)
=== RUN   TestOnlyTimeout
--- PASS: TestOnlyTimeout (0.01s)
=== RUN   TestLazy
--- PASS: TestLazy (0.01s)
=== RUN   TestSynthProposer
14:18:43.410 [35mDEBG [0m [32m          [0m Synthetic blinded beacon proposal swallowed
14:18:43.411 [35mDEBG [0m [32m          [0m Synthetic blinded beacon proposal swallowed
--- PASS: TestSynthProposer (0.00s)
=== RUN   TestSynthProposerBlockNotFound
--- PASS: TestSynthProposerBlockNotFound (0.00s)
=== RUN   TestValidatorCache
--- PASS: TestValidatorCache (0.00s)
PASS
coverage: 27.4% of statements
ok      github.com/obolnetwork/charon/app/eth2wrap  0.706s  coverage: 27.4% of statements
=== RUN   TestConfigs
=== RUN   TestConfigs/default
=== RUN   TestConfigs/default_max_jitter
=== RUN   TestConfigs/fast
--- PASS: TestConfigs (0.00s)
    --- PASS: TestConfigs/default (0.00s)
    --- PASS: TestConfigs/default_max_jitter (0.00s)
    --- PASS: TestConfigs/fast (0.00s)
=== RUN   TestNewWithReset
--- PASS: TestNewWithReset (0.00s)
PASS
coverage: 80.0% of statements
ok      github.com/obolnetwork/charon/app/expbackoff    0.239s  coverage: 80.0% of statements
=== RUN   TestAllFeatureStatus
--- PASS: TestAllFeatureStatus (0.00s)
=== RUN   TestConfig
14:18:43.679 [33mWARN [0m [32m          [0m Ignoring unknown enabled feature         {"feature":
"ignored"}
--- PASS: TestConfig (0.00s)
=== RUN   TestEnableForT
--- PASS: TestEnableForT (0.00s)
PASS
coverage: 33.6% of statements
ok      github.com/obolnetwork/charon/app/featureset    0.725s  coverage: 33.6% of statements
=== RUN   TestForkJoin
=== RUN   TestForkJoin/happy
=== RUN   TestForkJoin/first_error_fast_fail
=== RUN   TestForkJoin/all_error_no_fast_fail
=== RUN   TestForkJoin/all_context_cancel
--- PASS: TestForkJoin (0.00s)
    --- PASS: TestForkJoin/happy (0.00s)
    --- PASS: TestForkJoin/first_error_fast_fail (0.00s)
    --- PASS: TestForkJoin/all_error_no_fast_fail (0.00s)
    --- PASS: TestForkJoin/all_context_cancel (0.00s)
=== RUN   TestPanic
--- PASS: TestPanic (0.00s)
=== RUN   TestLeak
--- PASS: TestLeak (0.00s)
PASS
coverage: 87.9% of statements
ok      github.com/obolnetwork/charon/app/forkjoin  0.692s  coverage: 87.9% of statements
=== RUN   TestProposalFailuresCheck
=== RUN   TestProposalFailuresCheck/no_data
=== RUN   TestProposalFailuresCheck/no_failures
=== RUN   TestProposalFailuresCheck/full_proposal_failures
=== RUN   TestProposalFailuresCheck/blind_proposal_failures
=== RUN   TestProposalFailuresCheck/attestation_failures
=== RUN   TestProposalFailuresCheck/multiple_failures
--- PASS: TestProposalFailuresCheck (0.00s)
```

```
    --- PASS: TestProposalFailuresCheck/no_data (0.00s)
    --- PASS: TestProposalFailuresCheck/no_failures (0.00s)
    --- PASS: TestProposalFailuresCheck/full_proposal_failures (0.00s)
    --- PASS: TestProposalFailuresCheck/blind_proposal_failures (0.00s)
    --- PASS: TestProposalFailuresCheck/attestation_failures (0.00s)
    --- PASS: TestProposalFailuresCheck/multiple_failures (0.00s)
=== RUN   TestPendingValidatorsCheck
=== RUN   TestPendingValidatorsCheck/no_data
=== RUN   TestPendingValidatorsCheck/single_active
=== RUN   TestPendingValidatorsCheck/single_pending
=== RUN   TestPendingValidatorsCheck/single_activated
=== RUN   TestPendingValidatorsCheck/1o3_pending
--- PASS: TestPendingValidatorsCheck (0.00s)
    --- PASS: TestPendingValidatorsCheck/no_data (0.00s)
    --- PASS: TestPendingValidatorsCheck/single_active (0.00s)
    --- PASS: TestPendingValidatorsCheck/single_pending (0.00s)
    --- PASS: TestPendingValidatorsCheck/single_activated (0.00s)
    --- PASS: TestPendingValidatorsCheck/1o3_pending (0.00s)
=== RUN   TestInsufficientPeerCheck
=== RUN   TestInsufficientPeerCheck/no_data
=== RUN   TestInsufficientPeerCheck/no_peers
=== RUN   TestInsufficientPeerCheck/all_peers
=== RUN   TestInsufficientPeerCheck/quorum_peers
=== RUN   TestInsufficientPeerCheck/blip
--- PASS: TestInsufficientPeerCheck (0.00s)
    --- PASS: TestInsufficientPeerCheck/no_data (0.00s)
    --- PASS: TestInsufficientPeerCheck/no_peers (0.00s)
    --- PASS: TestInsufficientPeerCheck/all_peers (0.00s)
    --- PASS: TestInsufficientPeerCheck/quorum_peers (0.00s)
    --- PASS: TestInsufficientPeerCheck/blip (0.00s)
=== RUN   TestBNSyncingCheck
=== RUN   TestBNSyncingCheck/no_data
=== RUN   TestBNSyncingCheck/single_zero
=== RUN   TestBNSyncingCheck/multiple_constants
=== RUN   TestBNSyncingCheck/blip
--- PASS: TestBNSyncingCheck (0.00s)
    --- PASS: TestBNSyncingCheck/no_data (0.00s)
    --- PASS: TestBNSyncingCheck/single_zero (0.00s)
    --- PASS: TestBNSyncingCheck/multiple_constants (0.00s)
    --- PASS: TestBNSyncingCheck/blip (0.00s)
=== RUN   TestErrorLogsCheck
=== RUN   TestErrorLogsCheck/no_data
=== RUN   TestErrorLogsCheck/single_zero
=== RUN   TestErrorLogsCheck/multiple_zeros
=== RUN   TestErrorLogsCheck/multiple_constants
=== RUN   TestErrorLogsCheck/too_few
=== RUN   TestErrorLogsCheck/too_few_multi
=== RUN   TestErrorLogsCheck/sufficient
--- PASS: TestErrorLogsCheck (0.00s)
    --- PASS: TestErrorLogsCheck/no_data (0.00s)
    --- PASS: TestErrorLogsCheck/single_zero (0.00s)
    --- PASS: TestErrorLogsCheck/multiple_zeros (0.00s)
    --- PASS: TestErrorLogsCheck/multiple_constants (0.00s)
    --- PASS: TestErrorLogsCheck/too_few (0.00s)
    --- PASS: TestErrorLogsCheck/too_few_multi (0.00s)
    --- PASS: TestErrorLogsCheck/sufficient (0.00s)
=== RUN   TestWarnLogsCheck
=== RUN   TestWarnLogsCheck/no_data
=== RUN   TestWarnLogsCheck/single_zero
=== RUN   TestWarnLogsCheck/multiple_zeros
=== RUN   TestWarnLogsCheck/multiple_constants
=== RUN   TestWarnLogsCheck/too_few
=== RUN   TestWarnLogsCheck/too_few_multi
=== RUN   TestWarnLogsCheck/sufficient
--- PASS: TestWarnLogsCheck (0.00s)
    --- PASS: TestWarnLogsCheck/no_data (0.00s)
    --- PASS: TestWarnLogsCheck/single_zero (0.00s)
    --- PASS: TestWarnLogsCheck/multiple_zeros (0.00s)
    --- PASS: TestWarnLogsCheck/multiple_constants (0.00s)
    --- PASS: TestWarnLogsCheck/too_few (0.00s)
    --- PASS: TestWarnLogsCheck/too_few_multi (0.00s)
    --- PASS: TestWarnLogsCheck/sufficient (0.00s)
```

```
=== RUN   TestHighRegistrationFailuresRateCheck
=== RUN   TestHighRegistrationFailuresRateCheck/no_data
=== RUN   TestHighRegistrationFailuresRateCheck/same_errors_count
=== RUN   TestHighRegistrationFailuresRateCheck/incrementing_errors_count
=== RUN   TestHighRegistrationFailuresRateCheck/both_labels_have_stable_errors_count
=== RUN   TestHighRegistrationFailuresRateCheck/both_labels_have_increasing_errors_count
--- PASS: TestHighRegistrationFailuresRateCheck (0.00s)
    --- PASS: TestHighRegistrationFailuresRateCheck/no_data (0.00s)
    --- PASS: TestHighRegistrationFailuresRateCheck/same_errors_count (0.00s)
    --- PASS: TestHighRegistrationFailuresRateCheck/incrementing_errors_count (0.00s)
    --- PASS: TestHighRegistrationFailuresRateCheck/both_labels_have_stable_errors_count (0.00s)
    --- PASS: TestHighRegistrationFailuresRateCheck/both_labels_have_increasing_errors_count (0.00s)
=== RUN   TestMetricsHighCardinalityCheck
=== RUN   TestMetricsHighCardinalityCheck/no_data
=== RUN   TestMetricsHighCardinalityCheck/high_cardinality
--- PASS: TestMetricsHighCardinalityCheck (0.00s)
    --- PASS: TestMetricsHighCardinalityCheck/no_data (0.00s)
    --- PASS: TestMetricsHighCardinalityCheck/high_cardinality (0.00s)
PASS
coverage: 38.4% of statements
ok      github.com/obolnetwork/charon/app/health    0.575s  coverage: 38.4% of statements
=== RUN   TestK1Util
--- PASS: TestK1Util (0.01s)
=== RUN   TestRandom
--- PASS: TestRandom (0.00s)
=== RUN   TestLoad
=== RUN   TestLoad/nonexistent_file
=== RUN   TestLoad/invalid_hex_encoded_file
=== RUN   TestLoad/valid_hex_strings
--- PASS: TestLoad (0.00s)
    --- PASS: TestLoad/nonexistent_file (0.00s)
    --- PASS: TestLoad/invalid_hex_encoded_file (0.00s)
    --- PASS: TestLoad/valid_hex_strings (0.00s)
PASS
coverage: 63.2% of statements
ok      github.com/obolnetwork/charon/app/k1util    0.418s  coverage: 63.2% of statements
=== RUN   TestManager
=== RUN   TestManager/sync_stops
14:18:44.241 [34mINFO [0m [32m          [0m Shutdown signal detected
14:18:44.242 [34mINFO [0m [32mapp-stop   [0m Shutting down gracefully
=== RUN   TestManager/sync_start_and_stop
14:18:44.242 [34mINFO [0m [32m          [0m Shutdown signal detected
14:18:44.242 [34mINFO [0m [32mapp-stop   [0m Shutting down gracefully
=== RUN   TestManager/async_app_ctx_start
14:18:44.242 [34mINFO [0m [32m          [0m Shutdown signal detected
14:18:44.242 [34mINFO [0m [32mapp-stop   [0m Shutting down gracefully
--- PASS: TestManager (0.00s)
    --- PASS: TestManager/sync_stops (0.00s)
    --- PASS: TestManager/sync_start_and_stop (0.00s)
    --- PASS: TestManager/async_app_ctx_start (0.00s)
PASS
coverage: 40.1% of statements
ok      github.com/obolnetwork/charon/app/lifecycle 0.331s  coverage: 40.1% of statements
    github.com/obolnetwork/charon/app/log/loki/lokipb/v1        coverage: 0.0% of statements
    github.com/obolnetwork/charon/app/peerinfo/peerinfopb/v1        coverage: 0.0% of statements
=== RUN   TestFormatZapTest
=== RUN   TestFormatZapTest/0
--- PASS: TestFormatZapTest (0.00s)
    --- PASS: TestFormatZapTest/0 (0.00s)
=== RUN   TestLokiCaller
14:18:45.025 INFO           test
--- PASS: TestLokiCaller (1.00s)
=== RUN   TestWithTopic
=== RUN   TestWithTopic/json
=== RUN   TestWithTopic/console
=== RUN   TestWithTopic/logfmt
--- PASS: TestWithTopic (0.00s)
    --- PASS: TestWithTopic/json (0.00s)
    --- PASS: TestWithTopic/console (0.00s)
    --- PASS: TestWithTopic/logfmt (0.00s)
=== RUN   TestWithContext
=== RUN   TestWithContext/json
```

```
=== RUN   TestWithContext/console
=== RUN   TestWithContext/logfmt
--- PASS: TestWithContext (0.00s)
    --- PASS: TestWithContext/json (0.00s)
    --- PASS: TestWithContext/console (0.00s)
    --- PASS: TestWithContext/logfmt (0.00s)
=== RUN   TestErrorWrap
=== RUN   TestErrorWrap/console
=== RUN   TestErrorWrap/logfmt
=== RUN   TestErrorWrap/json
--- PASS: TestErrorWrap (0.00s)
    --- PASS: TestErrorWrap/console (0.00s)
    --- PASS: TestErrorWrap/logfmt (0.00s)
    --- PASS: TestErrorWrap/json (0.00s)
=== RUN   TestErrorWrapOther
=== RUN   TestErrorWrapOther/console
=== RUN   TestErrorWrapOther/logfmt
=== RUN   TestErrorWrapOther/json
--- PASS: TestErrorWrapOther (0.00s)
    --- PASS: TestErrorWrapOther/console (0.00s)
    --- PASS: TestErrorWrapOther/logfmt (0.00s)
    --- PASS: TestErrorWrapOther/json (0.00s)
=== RUN   TestCopyFields
=== RUN   TestCopyFields/console
=== RUN   TestCopyFields/logfmt
=== RUN   TestCopyFields/json
--- PASS: TestCopyFields (0.00s)
    --- PASS: TestCopyFields/console (0.00s)
    --- PASS: TestCopyFields/logfmt (0.00s)
    --- PASS: TestCopyFields/json (0.00s)
=== RUN   TestFilterDefault
=== RUN   TestFilterDefault/console
=== RUN   TestFilterDefault/logfmt
=== RUN   TestFilterDefault/json
--- PASS: TestFilterDefault (0.00s)
    --- PASS: TestFilterDefault/console (0.00s)
    --- PASS: TestFilterDefault/logfmt (0.00s)
    --- PASS: TestFilterDefault/json (0.00s)
=== RUN   TestFilterNone
=== RUN   TestFilterNone/console
=== RUN   TestFilterNone/logfmt
=== RUN   TestFilterNone/json
--- PASS: TestFilterNone (0.00s)
    --- PASS: TestFilterNone/console (0.00s)
    --- PASS: TestFilterNone/logfmt (0.00s)
    --- PASS: TestFilterNone/json (0.00s)
=== RUN   TestSentinelStack
=== RUN   TestSentinelStack/console
=== RUN   TestSentinelStack/logfmt
=== RUN   TestSentinelStack/json
--- PASS: TestSentinelStack (0.00s)
    --- PASS: TestSentinelStack/console (0.00s)
    --- PASS: TestSentinelStack/logfmt (0.00s)
    --- PASS: TestSentinelStack/json (0.00s)
=== RUN   TestInstance
--- PASS: TestInstance (0.00s)
PASS
coverage: 35.5% of statements
ok      github.com/obolnetwork/charon/app/log   1.213s  coverage: 35.5% of statements
=== RUN   TestLoki
--- PASS: TestLoki (0.00s)
=== RUN   TestLongLines
--- PASS: TestLongLines (0.00s)
PASS
coverage: 49.4% of statements
ok      github.com/obolnetwork/charon/app/log/loki  0.339s  coverage: 49.4% of statements
=== RUN   TestLockPublish
=== RUN   TestLockPublish/2xx_response
--- PASS: TestLockPublish (0.02s)
    --- PASS: TestLockPublish/2xx_response (0.02s)
=== RUN   TestURLParsing
=== RUN   TestURLParsing/invalid_url
```

```
=== RUN   TestURLParsing/http_url
=== RUN   TestURLParsing/https_url
--- PASS: TestURLParsing (0.00s)
    --- PASS: TestURLParsing/invalid_url (0.00s)
    --- PASS: TestURLParsing/http_url (0.00s)
    --- PASS: TestURLParsing/https_url (0.00s)
=== RUN   TestLaunchpadDashURL
=== RUN   TestLaunchpadDashURL/produced_url_is_what_we_expect
--- PASS: TestLaunchpadDashURL (0.00s)
    --- PASS: TestLaunchpadDashURL/produced_url_is_what_we_expect (0.00s)
=== RUN   Test_PartialExitRequest
--- PASS: Test_PartialExitRequest (0.00s)
=== RUN   Test_UnsignedPartialExitRequest
--- PASS: Test_UnsignedPartialExitRequest (0.00s)
=== RUN   Test_PartialExits
--- PASS: Test_PartialExits (0.00s)
=== RUN   Test_FullExitAuthBlob
--- PASS: Test_FullExitAuthBlob (0.00s)
=== RUN   Test_ExitBlob
--- PASS: Test_ExitBlob (0.00s)
=== RUN   TestAPIFlow
--- PASS: TestAPIFlow (0.02s)
=== RUN   TestAPIFlowMissingSig
--- PASS: TestAPIFlowMissingSig (0.02s)
PASS
coverage: 26.8% of statements
ok      github.com/obolnetwork/charon/app/obolapi   0.446s  coverage: 26.8% of statements
=== RUN   TestSupporterVersion
=== RUN   TestSupporterVersion/v0.1.0
=== RUN   TestSupporterVersion/v0.1.1
=== RUN   TestSupporterVersion/v0.1.2
=== RUN   TestSupporterVersion/v0.1-rc
=== RUN   TestSupporterVersion/v0.1.3
=== RUN   TestSupporterVersion/v0.2.0
=== RUN   TestSupporterVersion/#00
--- PASS: TestSupporterVersion (0.00s)
    --- PASS: TestSupporterVersion/v0.1.0 (0.00s)
    --- PASS: TestSupporterVersion/v0.1.1 (0.00s)
    --- PASS: TestSupporterVersion/v0.1.2 (0.00s)
    --- PASS: TestSupporterVersion/v0.1-rc (0.00s)
    --- PASS: TestSupporterVersion/v0.1.3 (0.00s)
    --- PASS: TestSupporterVersion/v0.2.0 (0.00s)
    --- PASS: TestSupporterVersion/#00 (0.00s)
=== RUN   TestPeerBuilderAPIEnabledGauge
=== RUN   TestPeerBuilderAPIEnabledGauge/builder_enabled
=== RUN   TestPeerBuilderAPIEnabledGauge/builder_disabled
--- PASS: TestPeerBuilderAPIEnabledGauge (0.02s)
    --- PASS: TestPeerBuilderAPIEnabledGauge/builder_enabled (0.00s)
    --- PASS: TestPeerBuilderAPIEnabledGauge/builder_disabled (0.00s)
=== RUN   TestDoOnce
--- PASS: TestDoOnce (0.01s)
=== RUN   TestPeerInfo
14:18:45.763 [31mERRO [0m [32mpeerinfo  [0m Invalid peer version: unsupported peer version; coordinate
with operator to align versions {"peer": "adorable-painter", "peer_version": "v0.0",
"supported_versions": "[v0.20 v0.19]"}
    app/peerinfo/peerinfo.go:266 .supportedPeerVersion
    app/peerinfo/peerinfo.go:207 .func1
14:18:45.763 [33mWARN [0m [32mpeerinfo  [0m Mismatching peer lock hash              {"peer": "cute-
jewelry", "lock_hash": "0x303030303030"}
--- PASS: TestPeerInfo (0.02s)
PASS
coverage: 19.9% of statements
ok      github.com/obolnetwork/charon/app/peerinfo  0.371s  coverage: 19.9% of statements
=== RUN   TestService
--- PASS: TestService (0.01s)
PASS
coverage: 76.7% of statements
ok      github.com/obolnetwork/charon/app/privkeylock   0.549s  coverage: 76.7% of statements
=== RUN   TestWrapRegisterer
--- PASS: TestWrapRegisterer (0.00s)
=== RUN   TestResetGaugeVec
--- PASS: TestResetGaugeVec (0.00s)
```

```
PASS
coverage: 59.7% of statements
ok      github.com/obolnetwork/charon/app/promauto  0.408s  coverage: 59.7% of statements
=== RUN   TestCheck
=== RUN   TestCheck/nil
=== RUN   TestCheck/zero_msg,_nil_m2
=== RUN   TestCheck/all_populated
=== RUN   TestCheck/optionals_nil
=== RUN   TestCheck/nil_m3_in_optional_m2
=== RUN   TestCheck/zero_m4
=== RUN   TestCheck/m4_with_non-empty_containers
=== RUN   TestCheck/m4_with_nil_map_value
=== RUN   TestCheck/m4_with_nil_list_element
--- PASS: TestCheck (0.00s)
    --- PASS: TestCheck/nil (0.00s)
    --- PASS: TestCheck/zero_msg,_nil_m2 (0.00s)
    --- PASS: TestCheck/all_populated (0.00s)
    --- PASS: TestCheck/optionals_nil (0.00s)
    --- PASS: TestCheck/nil_m3_in_optional_m2 (0.00s)
    --- PASS: TestCheck/zero_m4 (0.00s)
    --- PASS: TestCheck/m4_with_non-empty_containers (0.00s)
    --- PASS: TestCheck/m4_with_nil_map_value (0.00s)
    --- PASS: TestCheck/m4_with_nil_list_element (0.00s)
=== RUN   TestFuzz
=== RUN   TestFuzz/*v1.M1
=== RUN   TestFuzz/*v1.M2
=== RUN   TestFuzz/*v1.M3
=== RUN   TestFuzz/*v1.M4
=== RUN   TestFuzz/*v1.Cluster
=== RUN   TestFuzz/*v1.SignedMutation
=== RUN   TestFuzz/*v1.SignedMutationList
=== RUN   TestFuzz/*v1.LegacyLock
=== RUN   TestFuzz/*v1.QBFTMsg
=== RUN   TestFuzz/*v1.PriorityScoredResult
=== RUN   TestFuzz/*v1.SniffedConsensusInstance
--- PASS: TestFuzz (0.00s)
    --- PASS: TestFuzz/*v1.M1 (0.00s)
    --- PASS: TestFuzz/*v1.M2 (0.00s)
    --- PASS: TestFuzz/*v1.M3 (0.00s)
    --- PASS: TestFuzz/*v1.M4 (0.00s)
    --- PASS: TestFuzz/*v1.Cluster (0.00s)
    --- PASS: TestFuzz/*v1.SignedMutation (0.00s)
    --- PASS: TestFuzz/*v1.SignedMutationList (0.00s)
    --- PASS: TestFuzz/*v1.LegacyLock (0.00s)
    --- PASS: TestFuzz/*v1.QBFTMsg (0.00s)
    --- PASS: TestFuzz/*v1.PriorityScoredResult (0.00s)
    --- PASS: TestFuzz/*v1.SniffedConsensusInstance (0.00s)
=== RUN   TestMaxIndex
--- PASS: TestMaxIndex (0.00s)
=== RUN   TestAttack
--- PASS: TestAttack (0.00s)
PASS
coverage: 21.9% of statements
ok      github.com/obolnetwork/charon/app/protonil  0.201s  coverage: 21.9% of statements
=== RUN   TestRetryer
=== RUN   TestRetryer/no_retries
=== RUN   TestRetryer/one_retry_on_ctx_cancelled
14:18:46.584 [33mWARN [0m [32mtest      [0m Temporary failure (will retry) calling test/test: context
canceled
    app/retry/retry.go:135 .DoAsync
    app/retry/retry_test.go:91 .func6
=== RUN   TestRetryer/not_retryable_error
14:18:46.584 [31mERRO [0m [32mtest      [0m Permanent failure calling test/test: some error
    app/retry/retry_test.go:44 .func3
    app/retry/retry_test.go:93 .3
    app/retry/retry.go:118 .DoAsync
    app/retry/retry_test.go:91 .func6
=== RUN   TestRetryer/5_retries_
14:18:46.584 [33mWARN [0m [32mtest      [0m Temporary failure (will retry) calling test/test: context
canceled
    app/retry/retry.go:135 .DoAsync
    app/retry/retry_test.go:91 .func6
```

```
14:18:46.584 [33mWARN [0m [32mtest      [0m Temporary failure (will retry) calling test/test: context
canceled
    app/retry/retry.go:135 .DoAsync
    app/retry/retry_test.go:91 .func6
14:18:46.584 [33mWARN [0m [32mtest      [0m Temporary failure (will retry) calling test/test: context
canceled
    app/retry/retry.go:135 .DoAsync
    app/retry/retry_test.go:91 .func6
14:18:46.584 [33mWARN [0m [32mtest      [0m Temporary failure (will retry) calling test/test: context
canceled
    app/retry/retry.go:135 .DoAsync
    app/retry/retry_test.go:91 .func6
14:18:46.584 [33mWARN [0m [32mtest      [0m Temporary failure (will retry) calling test/test: context
canceled
    app/retry/retry.go:135 .DoAsync
    app/retry/retry_test.go:91 .func6
=== RUN   TestRetryer/timeout_after_1_retry_
14:18:46.584 [33mWARN [0m [32mtest      [0m Temporary failure (will retry) calling test/test: context
canceled
    app/retry/retry.go:135 .DoAsync
    app/retry/retry_test.go:91 .func6
--- PASS: TestRetryer (0.00s)
    --- PASS: TestRetryer/no_retries (0.00s)
    --- PASS: TestRetryer/one_retry_on_ctx_cancelled (0.00s)
    --- PASS: TestRetryer/not_retryable_error (0.00s)
    --- PASS: TestRetryer/5_retries_ (0.00s)
    --- PASS: TestRetryer/timeout_after_1_retry_ (0.00s)
=== RUN   TestShutdown
--- PASS: TestShutdown (0.11s)
PASS
coverage: 18.3% of statements
ok      github.com/obolnetwork/charon/app/retry 0.318s  coverage: 18.3% of statements
=== RUN   TestDefaultNoopTracer
--- PASS: TestDefaultNoopTracer (0.00s)
=== RUN   TestStdOutTracer
--- PASS: TestStdOutTracer (0.00s)
PASS
coverage: 50.0% of statements
ok      github.com/obolnetwork/charon/app/tracer    0.636s  coverage: 50.0% of statements
=== RUN   TestValidVersion
--- PASS: TestValidVersion (0.00s)
=== RUN   TestParseSemVer
=== RUN   TestParseSemVer/Patch
=== RUN   TestParseSemVer/PreRelease
=== RUN   TestParseSemVer/Minor
=== RUN   TestParseSemVer/Empty
=== RUN   TestParseSemVer/Invalid_1
=== RUN   TestParseSemVer/No_v_prefix
=== RUN   TestParseSemVer/Invalid_2
--- PASS: TestParseSemVer (0.00s)
    --- PASS: TestParseSemVer/Patch (0.00s)
    --- PASS: TestParseSemVer/PreRelease (0.00s)
    --- PASS: TestParseSemVer/Minor (0.00s)
    --- PASS: TestParseSemVer/Empty (0.00s)
    --- PASS: TestParseSemVer/Invalid_1 (0.00s)
    --- PASS: TestParseSemVer/No_v_prefix (0.00s)
    --- PASS: TestParseSemVer/Invalid_2 (0.00s)
=== RUN   TestSemVerCompare
=== RUN   TestSemVerCompare/v0.1.0-v0.1.0
=== RUN   TestSemVerCompare/v0.1.0-v0.1.1
=== RUN   TestSemVerCompare/v0.1.1-v0.1.0
=== RUN   TestSemVerCompare/v0.1.1-v0.1
=== RUN   TestSemVerCompare/v0.2.1-v0.1
=== RUN   TestSemVerCompare/v0.1-v0.1-dev
=== RUN   TestSemVerCompare/v0.1-dev-v0.2
--- PASS: TestSemVerCompare (0.00s)
    --- PASS: TestSemVerCompare/v0.1.0-v0.1.0 (0.00s)
    --- PASS: TestSemVerCompare/v0.1.0-v0.1.1 (0.00s)
    --- PASS: TestSemVerCompare/v0.1.1-v0.1.0 (0.00s)
    --- PASS: TestSemVerCompare/v0.1.1-v0.1 (0.00s)
    --- PASS: TestSemVerCompare/v0.2.1-v0.1 (0.00s)
    --- PASS: TestSemVerCompare/v0.1-v0.1-dev (0.00s)
```

```
    --- PASS: TestSemVerCompare/v0.1-dev-v0.2 (0.00s)
=== RUN   TestIsPrerelease
--- PASS: TestIsPrerelease (0.00s)
=== RUN   TestCurrentInSupported
--- PASS: TestCurrentInSupported (0.00s)
=== RUN   TestSupportedAreminors
--- PASS: TestSupportedAreminors (0.00s)
=== RUN   TestMultiSupported
--- PASS: TestMultiSupported (0.00s)
PASS
coverage: 26.1% of statements
ok      github.com/obolnetwork/charon/app/version   0.504s  coverage: 26.1% of statements
=== RUN   TestFields
--- PASS: TestFields (0.00s)
=== RUN   TestContainsField
--- PASS: TestContainsField (0.00s)
=== RUN   TestErr
--- PASS: TestErr (0.00s)
=== RUN   TestStr
--- PASS: TestStr (0.00s)
=== RUN   TestBool
--- PASS: TestBool (0.00s)
=== RUN   TestI64
--- PASS: TestI64 (0.00s)
=== RUN   TestU64
--- PASS: TestU64 (0.00s)
=== RUN   TestInt
--- PASS: TestInt (0.00s)
=== RUN   TestUint
--- PASS: TestUint (0.00s)
=== RUN   TestF64
--- PASS: TestF64 (0.00s)
=== RUN   TestAny
--- PASS: TestAny (0.00s)
=== RUN   TestSkip
--- PASS: TestSkip (0.00s)
PASS
coverage: 88.1% of statements
ok      github.com/obolnetwork/charon/app/z 0.352s  coverage: 88.1% of statements
    github.com/obolnetwork/charon/cluster/manifestpb/v1     coverage: 0.0% of statements
=== RUN   TestDefinitionVerify
=== RUN   TestDefinitionVerify/verify_definition_v1.5_solo
=== RUN   TestDefinitionVerify/verify_definition_v1.5
=== RUN   TestDefinitionVerify/verify_definition_v1.4
=== RUN   TestDefinitionVerify/verify_definition_v1.3
=== RUN   TestDefinitionVerify/verify_definition_v1.2_or_lower
=== RUN   TestDefinitionVerify/unsigned_creator_and_operators
=== RUN   TestDefinitionVerify/unsigned_operators_v1.3
=== RUN   TestDefinitionVerify/empty_operator_signatures
=== RUN   TestDefinitionVerify/some_operators_didn't_sign
=== RUN   TestDefinitionVerify/no_operators_no_creator
=== RUN   TestDefinitionVerify/creator_didn't_sign
=== RUN   TestDefinitionVerify/solo_flow_definition_empty_operators_slice
=== RUN   TestDefinitionVerify/solo_flow_definition_empty_operator_structs
--- PASS: TestDefinitionVerify (0.02s)
    --- PASS: TestDefinitionVerify/verify_definition_v1.5_solo (0.00s)
    --- PASS: TestDefinitionVerify/verify_definition_v1.5 (0.00s)
    --- PASS: TestDefinitionVerify/verify_definition_v1.4 (0.00s)
    --- PASS: TestDefinitionVerify/verify_definition_v1.3 (0.00s)
    --- PASS: TestDefinitionVerify/verify_definition_v1.2_or_lower (0.00s)
    --- PASS: TestDefinitionVerify/unsigned_creator_and_operators (0.00s)
    --- PASS: TestDefinitionVerify/unsigned_operators_v1.3 (0.00s)
    --- PASS: TestDefinitionVerify/empty_operator_signatures (0.00s)
    --- PASS: TestDefinitionVerify/some_operators_didn't_sign (0.00s)
    --- PASS: TestDefinitionVerify/no_operators_no_creator (0.00s)
    --- PASS: TestDefinitionVerify/creator_didn't_sign (0.00s)
    --- PASS: TestDefinitionVerify/solo_flow_definition_empty_operators_slice (0.00s)
    --- PASS: TestDefinitionVerify/solo_flow_definition_empty_operator_structs (0.00s)
=== RUN   TestSupportEIP712Sigs
--- PASS: TestSupportEIP712Sigs (0.00s)
=== RUN   TestSupportPartialDeposits
--- PASS: TestSupportPartialDeposits (0.00s)
```

```
=== RUN   TestDepositJSON
--- PASS: TestDepositJSON (0.00s)
=== RUN   TestDepositArrayJSON
=== RUN   TestDepositArrayJSON/nil
--- PASS: TestDepositArrayJSON (0.00s)
    --- PASS: TestDepositArrayJSON/nil (0.00s)
=== RUN   TestLeftPad
--- PASS: TestLeftPad (0.00s)
=== RUN   TestVerifySig
=== RUN   TestVerifySig/valid_signature
=== RUN   TestVerifySig/invalid_signature_length
=== RUN   TestVerifySig/invalid_recovery_id
=== RUN   TestVerifySig/sig_ending_with_27/28
--- PASS: TestVerifySig (0.00s)
    --- PASS: TestVerifySig/valid_signature (0.00s)
    --- PASS: TestVerifySig/invalid_signature_length (0.00s)
    --- PASS: TestVerifySig/invalid_recovery_id (0.00s)
    --- PASS: TestVerifySig/sig_ending_with_27/28 (0.00s)
=== RUN   TestFetchDefinition
=== RUN   TestFetchDefinition/Fetch_valid_definition
=== RUN   TestFetchDefinition/Fetch_invalid_definition
=== RUN   TestFetchDefinition/HTTP_status_is_not_in_the_200_range
--- PASS: TestFetchDefinition (0.01s)
    --- PASS: TestFetchDefinition/Fetch_valid_definition (0.01s)
    --- PASS: TestFetchDefinition/Fetch_invalid_definition (0.00s)
    --- PASS: TestFetchDefinition/HTTP_status_is_not_in_the_200_range (0.00s)
=== RUN   TestCreateValidatorKeysDir
=== RUN   TestCreateValidatorKeysDir/mkdir_error
--- PASS: TestCreateValidatorKeysDir (0.00s)
    --- PASS: TestCreateValidatorKeysDir/mkdir_error (0.00s)
=== RUN   TestGetName
--- PASS: TestGetName (0.00s)
=== RUN   TestHashBuilderRegistration
--- PASS: TestHashBuilderRegistration (0.00s)
=== RUN   TestEncode
=== RUN   TestEncode/v1.0.0
=== RUN   TestEncode/v1.0.0/definition_json_v1_0_0
=== RUN   TestEncode/v1.0.0/lock_json_v1_0_0
=== RUN   TestEncode/v1.8.0
=== RUN   TestEncode/v1.8.0/definition_json_v1_8_0
=== RUN   TestEncode/v1.8.0/lock_json_v1_8_0
=== RUN   TestEncode/v1.7.0
=== RUN   TestEncode/v1.7.0/definition_json_v1_7_0
=== RUN   TestEncode/v1.7.0/lock_json_v1_7_0
=== RUN   TestEncode/v1.4.0
=== RUN   TestEncode/v1.4.0/definition_json_v1_4_0
=== RUN   TestEncode/v1.4.0/lock_json_v1_4_0
=== RUN   TestEncode/v1.3.0
=== RUN   TestEncode/v1.3.0/definition_json_v1_3_0
=== RUN   TestEncode/v1.3.0/lock_json_v1_3_0
=== RUN   TestEncode/v1.2.0
=== RUN   TestEncode/v1.2.0/definition_json_v1_2_0
=== RUN   TestEncode/v1.2.0/lock_json_v1_2_0
=== RUN   TestEncode/v1.1.0
=== RUN   TestEncode/v1.1.0/definition_json_v1_1_0
=== RUN   TestEncode/v1.1.0/lock_json_v1_1_0
=== RUN   TestEncode/v1.6.0
=== RUN   TestEncode/v1.6.0/definition_json_v1_6_0
=== RUN   TestEncode/v1.6.0/lock_json_v1_6_0
=== RUN   TestEncode/v1.5.0
=== RUN   TestEncode/v1.5.0/definition_json_v1_5_0
=== RUN   TestEncode/v1.5.0/lock_json_v1_5_0
--- PASS: TestEncode (0.01s)
    --- PASS: TestEncode/v1.0.0 (0.00s)
        --- PASS: TestEncode/v1.0.0/definition_json_v1_0_0 (0.00s)
        --- PASS: TestEncode/v1.0.0/lock_json_v1_0_0 (0.00s)
    --- PASS: TestEncode/v1.8.0 (0.00s)
        --- PASS: TestEncode/v1.8.0/definition_json_v1_8_0 (0.00s)
        --- PASS: TestEncode/v1.8.0/lock_json_v1_8_0 (0.00s)
    --- PASS: TestEncode/v1.7.0 (0.01s)
        --- PASS: TestEncode/v1.7.0/definition_json_v1_7_0 (0.00s)
        --- PASS: TestEncode/v1.7.0/lock_json_v1_7_0 (0.00s)
```

```
    --- PASS: TestEncode/v1.4.0 (0.00s)
        --- PASS: TestEncode/v1.4.0/definition_json_v1_4_0 (0.00s)
        --- PASS: TestEncode/v1.4.0/lock_json_v1_4_0 (0.00s)
    --- PASS: TestEncode/v1.3.0 (0.00s)
        --- PASS: TestEncode/v1.3.0/definition_json_v1_3_0 (0.00s)
        --- PASS: TestEncode/v1.3.0/lock_json_v1_3_0 (0.00s)
    --- PASS: TestEncode/v1.2.0 (0.00s)
        --- PASS: TestEncode/v1.2.0/definition_json_v1_2_0 (0.00s)
        --- PASS: TestEncode/v1.2.0/lock_json_v1_2_0 (0.00s)
    --- PASS: TestEncode/v1.1.0 (0.00s)
        --- PASS: TestEncode/v1.1.0/definition_json_v1_1_0 (0.00s)
        --- PASS: TestEncode/v1.1.0/lock_json_v1_1_0 (0.00s)
    --- PASS: TestEncode/v1.6.0 (0.00s)
        --- PASS: TestEncode/v1.6.0/definition_json_v1_6_0 (0.00s)
        --- PASS: TestEncode/v1.6.0/lock_json_v1_6_0 (0.00s)
    --- PASS: TestEncode/v1.5.0 (0.00s)
        --- PASS: TestEncode/v1.5.0/definition_json_v1_5_0 (0.00s)
        --- PASS: TestEncode/v1.5.0/lock_json_v1_5_0 (0.00s)
=== RUN   TestUnsupportedVersion
--- PASS: TestUnsupportedVersion (0.00s)
=== RUN   TestExamples
=== RUN   TestExamples/cluster-lock-000.json
=== RUN   TestExamples/cluster-lock-001.json
=== RUN   TestExamples/cluster-lock-002.json
=== RUN   TestExamples/cluster-lock-003.json
=== RUN   TestExamples/cluster-definition-000.json
=== RUN   TestExamples/cluster-definition-001.json
=== RUN   TestExamples/cluster-definition-002.json
=== RUN   TestExamples/cluster-definition-003.json
=== RUN   TestExamples/cluster-definition-004.json
=== RUN   TestExamples/cluster-definition-005.json
--- PASS: TestExamples (0.04s)
    --- PASS: TestExamples/cluster-lock-000.json (0.01s)
    --- PASS: TestExamples/cluster-lock-001.json (0.01s)
    --- PASS: TestExamples/cluster-lock-002.json (0.00s)
    --- PASS: TestExamples/cluster-lock-003.json (0.01s)
    --- PASS: TestExamples/cluster-definition-000.json (0.01s)
    --- PASS: TestExamples/cluster-definition-001.json (0.00s)
    --- PASS: TestExamples/cluster-definition-002.json (0.00s)
    --- PASS: TestExamples/cluster-definition-003.json (0.00s)
    --- PASS: TestExamples/cluster-definition-004.json (0.00s)
    --- PASS: TestExamples/cluster-definition-005.json (0.00s)
=== RUN   TestDefinitionPeers
--- PASS: TestDefinitionPeers (0.01s)
=== RUN   TestVerifyLock
--- PASS: TestVerifyLock (0.02s)
=== RUN   TestNewCluster
--- PASS: TestNewCluster (0.02s)
PASS
coverage: 56.0% of statements
ok      github.com/obolnetwork/charon/cluster   0.389s  coverage: 56.0% of statements
=== RUN   TestDuplicateENRs
--- PASS: TestDuplicateENRs (0.01s)
=== RUN   TestLoadLegacy
=== RUN   TestLoadLegacy/v1.1.0
=== RUN   TestLoadLegacy/v1.8.0
=== RUN   TestLoadLegacy/v1.7.0
=== RUN   TestLoadLegacy/v1.4.0
=== RUN   TestLoadLegacy/v1.3.0
=== RUN   TestLoadLegacy/v1.2.0
=== RUN   TestLoadLegacy/v1.0.0
=== RUN   TestLoadLegacy/v1.6.0
=== RUN   TestLoadLegacy/v1.5.0
--- PASS: TestLoadLegacy (0.16s)
    --- PASS: TestLoadLegacy/v1.1.0 (0.03s)
    --- PASS: TestLoadLegacy/v1.8.0 (0.01s)
    --- PASS: TestLoadLegacy/v1.7.0 (0.01s)
    --- PASS: TestLoadLegacy/v1.4.0 (0.01s)
    --- PASS: TestLoadLegacy/v1.3.0 (0.04s)
    --- PASS: TestLoadLegacy/v1.2.0 (0.00s)
    --- PASS: TestLoadLegacy/v1.0.0 (0.00s)
    --- PASS: TestLoadLegacy/v1.6.0 (0.03s)
```

```
    --- PASS: TestLoadLegacy/v1.5.0 (0.02s)
=== RUN   TestLoadManifest
=== RUN   TestLoadManifest/no_file
=== RUN   TestLoadManifest/only_manifest
=== RUN   TestLoadManifest/only_legacy_lock
=== RUN   TestLoadManifest/both_files
=== RUN   TestLoadManifest/mismatching_cluster_hashes
--- PASS: TestLoadManifest (0.02s)
    --- PASS: TestLoadManifest/no_file (0.00s)
    --- PASS: TestLoadManifest/only_manifest (0.00s)
    --- PASS: TestLoadManifest/only_legacy_lock (0.00s)
    --- PASS: TestLoadManifest/both_files (0.01s)
    --- PASS: TestLoadManifest/mismatching_cluster_hashes (0.00s)
=== RUN   TestLoadModifiedLegacyLock
--- PASS: TestLoadModifiedLegacyLock (0.00s)
=== RUN   TestGenValidators
=== RUN   TestGenValidators/unmarshal
=== RUN   TestGenValidators/transform
=== RUN   TestGenValidators/proto
--- PASS: TestGenValidators (0.00s)
    --- PASS: TestGenValidators/unmarshal (0.00s)
    --- PASS: TestGenValidators/transform (0.00s)
    --- PASS: TestGenValidators/proto (0.00s)
=== RUN   TestAddValidators
=== RUN   TestAddValidators/proto
=== RUN   TestAddValidators/unmarshal
=== RUN   TestAddValidators/transform
--- PASS: TestAddValidators (0.02s)
    --- PASS: TestAddValidators/proto (0.00s)
    --- PASS: TestAddValidators/unmarshal (0.00s)
    --- PASS: TestAddValidators/transform (0.00s)
=== RUN   TestZeroCluster
--- PASS: TestZeroCluster (0.00s)
=== RUN   TestLegacyLock
=== RUN   TestLegacyLock/proto
=== RUN   TestLegacyLock/cluster
=== RUN   TestLegacyLock/proto_again
=== RUN   TestLegacyLock/cluster_loaded_from_lock
=== RUN   TestLegacyLock/cluster_loaded_from_manifest
--- PASS: TestLegacyLock (0.01s)
    --- PASS: TestLegacyLock/proto (0.00s)
    --- PASS: TestLegacyLock/cluster (0.00s)
    --- PASS: TestLegacyLock/proto_again (0.00s)
    --- PASS: TestLegacyLock/cluster_loaded_from_lock (0.01s)
    --- PASS: TestLegacyLock/cluster_loaded_from_manifest (0.00s)
=== RUN   TestNodeApprovals
=== RUN   TestNodeApprovals/proto
=== RUN   TestNodeApprovals/unmarshal
=== RUN   TestNodeApprovals/transform
--- PASS: TestNodeApprovals (0.01s)
    --- PASS: TestNodeApprovals/proto (0.00s)
    --- PASS: TestNodeApprovals/unmarshal (0.00s)
    --- PASS: TestNodeApprovals/transform (0.00s)
PASS
coverage: 31.5% of statements
ok      github.com/obolnetwork/charon/cluster/manifest  0.575s  coverage: 31.5% of statements
    github.com/obolnetwork/charon/core/corepb/v1        coverage: 0.0% of statements
    github.com/obolnetwork/charon/core/infosync     coverage: 0.0% of statements
=== RUN   TestValidateConfigAddValidators
=== RUN   TestValidateConfigAddValidators/insufficient_validators
=== RUN   TestValidateConfigAddValidators/empty_fee_recipient_addrs
=== RUN   TestValidateConfigAddValidators/empty_withdrawal_addrs
=== RUN   TestValidateConfigAddValidators/addrs_length_mismatch
=== RUN   TestValidateConfigAddValidators/single_addr_for_all_validators
=== RUN   TestValidateConfigAddValidators/count_and_addrs_mismatch
=== RUN   TestValidateConfigAddValidators/multiple_addrs_for_multiple_validators
--- PASS: TestValidateConfigAddValidators (0.00s)
    --- PASS: TestValidateConfigAddValidators/insufficient_validators (0.00s)
    --- PASS: TestValidateConfigAddValidators/empty_fee_recipient_addrs (0.00s)
    --- PASS: TestValidateConfigAddValidators/empty_withdrawal_addrs (0.00s)
    --- PASS: TestValidateConfigAddValidators/addrs_length_mismatch (0.00s)
    --- PASS: TestValidateConfigAddValidators/single_addr_for_all_validators (0.00s)
```

```
    --- PASS: TestValidateConfigAddValidators/count_and_addrs_mismatch (0.00s)
    --- PASS: TestValidateConfigAddValidators/multiple_addrs_for_multiple_validators (0.00s)
=== RUN   TestRunAddValidators
=== RUN   TestRunAddValidators/add_validators_once
14:18:49.097 [34mINFO [0m [32m          [0m Cluster manifest loaded                {"cluster_name":
"test cluster", "cluster_hash": "3c5203a", "num_validators": 1}
14:18:49.205 [35mDEBG [0m [32m          [0m Saved deposit data file to disk        {"deposit_data":
"deposit-data-20240320141849.json"}
14:18:49.205 [35mDEBG [0m [32m          [0m Saved cluster manifest file to disk
14:18:49.205 [35mDEBG [0m [32m          [0m Created new validator                  {"pubkey":
"972_fa3"}
14:18:49.205 [34mINFO [0m [32m          [0m Successfully added validators to cluster 🎉
=== RUN   TestRunAddValidators/add_validators_twice
14:18:49.215 [34mINFO [0m [32m          [0m Cluster manifest loaded                {"cluster_name":
"test cluster", "cluster_hash": "49baafd", "num_validators": 1}
14:18:49.320 [35mDEBG [0m [32m          [0m Saved deposit data file to disk        {"deposit_data":
"deposit-data-20240320141849.json"}
14:18:49.320 [35mDEBG [0m [32m          [0m Saved cluster manifest file to disk
14:18:49.320 [35mDEBG [0m [32m          [0m Created new validator                  {"pubkey":
"abe_d9b"}
14:18:49.320 [34mINFO [0m [32m          [0m Successfully added validators to cluster 🎉
14:18:49.324 [34mINFO [0m [32m          [0m Cluster manifest loaded                {"cluster_name":
"test cluster", "cluster_hash": "49baafd", "num_validators": 2}
14:18:49.427 [35mDEBG [0m [32m          [0m Saved deposit data file to disk        {"deposit_data":
"deposit-data-20240320141849.json"}
14:18:49.427 [35mDEBG [0m [32m          [0m Saved cluster manifest file to disk
14:18:49.427 [35mDEBG [0m [32m          [0m Created new validator                  {"pubkey":
"a8c_150"}
14:18:49.427 [34mINFO [0m [32m          [0m Successfully added validators to cluster 🎉
--- PASS: TestRunAddValidators (0.35s)
    --- PASS: TestRunAddValidators/add_validators_once (0.13s)
    --- PASS: TestRunAddValidators/add_validators_twice (0.23s)
=== RUN   TestValidateP2PKeysOrder
=== RUN   TestValidateP2PKeysOrder/correct_order
=== RUN   TestValidateP2PKeysOrder/length_mismatch
=== RUN   TestValidateP2PKeysOrder/invalid_order
--- PASS: TestValidateP2PKeysOrder (0.00s)
    --- PASS: TestValidateP2PKeysOrder/correct_order (0.00s)
    --- PASS: TestValidateP2PKeysOrder/length_mismatch (0.00s)
    --- PASS: TestValidateP2PKeysOrder/invalid_order (0.00s)
=== RUN   TestCmdFlags
=== RUN   TestCmdFlags/version_verbose
=== RUN   TestCmdFlags/version_no_verbose
=== RUN   TestCmdFlags/version_verbose_env
=== RUN   TestCmdFlags/run_command
14:18:49.443 INFO           This software is licensed under the Maria DB Business Source License 1.1;
you may not use this software except in compliance with this license. You may obtain a copy of this
license at https://github.com/ObolNetwork/charon/blob/main/LICENSE
14:18:49.443 INFO           Parsed config                              {"beacon-node-endpoints": "
[http://beacon.node]", "builder-api": "false", "debug-address": "", "feature-set": "stable", "feature-
set-disable": "[]", "feature-set-enable": "[]", "help": "false", "jaeger-address": "", "jaeger-service":
"charon", "lock-file": ".charon/cluster-lock.json", "log-color": "auto", "log-format": "console", "log-
level": "info", "log-output-path": "", "loki-addresses": "[]", "loki-service": "charon", "manifest-file":
".charon/cluster-manifest.pb", "monitoring-address": "127.0.0.1:3620", "no-verify": "false", "p2p-
disable-reuseport": "false", "p2p-external-hostname": "", "p2p-external-ip": "", "p2p-relays": "
[https://0.relay.obol.tech,https://1.relay.obol.tech]", "p2p-tcp-address": "[]", "private-key-file":
".charon/charon-enr-private-key", "private-key-file-lock": "false", "simnet-beacon-mock": "false",
"simnet-beacon-mock-fuzz": "false", "simnet-slot-duration": "1s", "simnet-validator-keys-dir":
".charon/validator_keys", "simnet-validator-mock": "false", "synthetic-block-proposals": "false",
"testnet-chain-id": "0", "testnet-fork-version": "", "testnet-genesis-timestamp": "0", "testnet-name":
"", "validator-api-address": "127.0.0.1:3600"}
=== RUN   TestCmdFlags/create_enr
=== RUN   TestCmdFlags/run_require_beacon_addrs
=== RUN   TestCmdFlags/unsafe_run
14:18:49.449 INFO           This software is licensed under the Maria DB Business Source License 1.1;
you may not use this software except in compliance with this license. You may obtain a copy of this
license at https://github.com/ObolNetwork/charon/blob/main/LICENSE
14:18:49.449 INFO           Parsed config                              {"beacon-node-endpoints": "
[http://beacon.node]", "builder-api": "false", "debug-address": "", "feature-set": "stable", "feature-
set-disable": "[]", "feature-set-enable": "[]", "help": "false", "jaeger-address": "", "jaeger-service":
"charon", "lock-file": ".charon/cluster-lock.json", "log-color": "auto", "log-format": "console", "log-
level": "info", "log-output-path": "", "loki-addresses": "[]", "loki-service": "charon", "manifest-file":
```

".charon/cluster-manifest.pb", "monitoring-address": "127.0.0.1:3620", "no-verify": "false", "p2p-disable-reuseport": "false", "p2p-external-hostname": "", "p2p-external-ip": "", "p2p-fuzz": "true", "p2p-relays": "[https://0.relay.obol.tech,https://1.relay.obol.tech]", "p2p-tcp-address": "[]", "private-key-file": ".charon/charon-enr-private-key", "private-key-file-lock": "false", "simnet-beacon-mock": "false", "simnet-beacon-mock-fuzz": "false", "simnet-slot-duration": "1s", "simnet-validator-keys-dir": ".charon/validator_keys", "simnet-validator-mock": "false", "synthetic-block-proposals": "false", "testnet-chain-id": "0", "testnet-fork-version": "", "testnet-genesis-timestamp": "0", "testnet-name": "", "validator-api-address": "127.0.0.1:3600"}
=== RUN   TestCmdFlags/run_with_unsafe_flags,_unknown_flags
--- PASS: TestCmdFlags (0.01s)
    --- PASS: TestCmdFlags/version_verbose (0.00s)
    --- PASS: TestCmdFlags/version_no_verbose (0.00s)
    --- PASS: TestCmdFlags/version_verbose_env (0.00s)
    --- PASS: TestCmdFlags/run_command (0.00s)
    --- PASS: TestCmdFlags/create_enr (0.00s)
    --- PASS: TestCmdFlags/run_require_beacon_addrs (0.00s)
    --- PASS: TestCmdFlags/unsafe_run (0.00s)
    --- PASS: TestCmdFlags/run_with_unsafe_flags,_unknown_flags (0.00s)
=== RUN   TestFlagsToLogFields
--- PASS: TestFlagsToLogFields (0.00s)
=== RUN   TestRedact
=== RUN   TestRedact/redact_auth_tokens
=== RUN   TestRedact/redact_passwords_in_URL_addresses
=== RUN   TestRedact/no_redact
--- PASS: TestRedact (0.00s)
    --- PASS: TestRedact/redact_auth_tokens (0.00s)
    --- PASS: TestRedact/redact_passwords_in_URL_addresses (0.00s)
    --- PASS: TestRedact/no_redact (0.00s)
=== RUN   TestCreateCluster
14:18:49.451 INFO   Cluster definition loaded from disk   {"path": "../cluster/examples/cluster-definition-005.json", "definition_hash": "0x33a5baad2ce565fd1e46fb7f216a1a408cb947ee1ab942b085878e07063036e2"}
=== RUN   TestCreateCluster/simnet
=== RUN   TestCreateCluster/simnet/output
=== RUN   TestCreateCluster/simnet/files
=== RUN   TestCreateCluster/simnet/valid_lock
=== RUN   TestCreateCluster/two_partial_deposits
=== RUN   TestCreateCluster/two_partial_deposits/output
=== RUN   TestCreateCluster/two_partial_deposits/files
=== RUN   TestCreateCluster/two_partial_deposits/valid_lock
=== RUN   TestCreateCluster/four_partial_deposits
=== RUN   TestCreateCluster/four_partial_deposits/output
=== RUN   TestCreateCluster/four_partial_deposits/files
=== RUN   TestCreateCluster/four_partial_deposits/valid_lock
=== RUN   TestCreateCluster/splitkeys
=== RUN   TestCreateCluster/splitkeys/output
=== RUN   TestCreateCluster/splitkeys/files
=== RUN   TestCreateCluster/splitkeys/valid_lock
=== RUN   TestCreateCluster/splitkeys_with_cluster_definition
14:18:49.581 INFO   Cluster definition loaded from disk   {"path": "../cluster/examples/cluster-definition-005.json", "definition_hash": "0x33a5baad2ce565fd1e46fb7f216a1a408cb947ee1ab942b085878e07063036e2"}
14:18:49.582 WARN   Insecure keystores configured. ONLY DO THIS DURING TESTING
=== RUN   TestCreateCluster/splitkeys_with_cluster_definition/output
=== RUN   TestCreateCluster/splitkeys_with_cluster_definition/files
=== RUN   TestCreateCluster/splitkeys_with_cluster_definition/valid_lock
=== RUN   TestCreateCluster/splitkeys_with_cluster_definition,_but_amount_of_keys_read_from_disk_differ
14:18:49.620 INFO   Cluster definition loaded from disk   {"path": "../cluster/examples/cluster-definition-005.json", "definition_hash": "0x33a5baad2ce565fd1e46fb7f216a1a408cb947ee1ab942b085878e07063036e2"}
14:18:49.620 WARN   Insecure keystores configured. ONLY DO THIS DURING TESTING
14:18:49.620 ERRO   : amount of keys read from disk differs from cluster definition {"disk": 1, "definition": 2}
    cmd/createcluster.go:208 .runCreateCluster
    cmd/createcluster_internal_test.go:284 .testCreateCluster
    cmd/createcluster_internal_test.go:271 .func6
=== RUN   TestCreateCluster/missing_nodes_amount_flag
14:18:49.622 ERRO   : missing --nodes flag
    cmd/createcluster.go:324 .validateCreateConfig
    cmd/createcluster.go:149 .runCreateCluster
    cmd/createcluster_internal_test.go:284 .testCreateCluster
    cmd/createcluster_internal_test.go:271 .func6

```
=== RUN   TestCreateCluster/missing_network_flag
14:18:49.622 ERRO           : get network config: missing --network flag or testnet config flags
    cmd/createcluster.go:1125 .validateNetworkConfig
    cmd/createcluster.go:328 .validateCreateConfig
    cmd/createcluster.go:149 .runCreateCluster
    cmd/createcluster_internal_test.go:284 .testCreateCluster
    cmd/createcluster_internal_test.go:271 .func6
=== RUN   TestCreateCluster/missing_numdvs_with_no_split_keys_set
14:18:49.623 ERRO           : missing --num-validators flag
    cmd/createcluster.go:365 .validateCreateConfig
    cmd/createcluster.go:149 .runCreateCluster
    cmd/createcluster_internal_test.go:284 .testCreateCluster
    cmd/createcluster_internal_test.go:271 .func6
=== RUN   TestCreateCluster/splitkeys_with_numdvs_set
14:18:49.623 ERRO           : can't specify --num-validators with --split-existing-keys. Please fix
configuration flags
    cmd/createcluster.go:361 .validateCreateConfig
    cmd/createcluster.go:149 .runCreateCluster
    cmd/createcluster_internal_test.go:284 .testCreateCluster
    cmd/createcluster_internal_test.go:271 .func6
=== RUN   TestCreateCluster/goerli
14:18:49.624 WARN           Non standard threshold provided, this will affect cluster safety
{"num_nodes": 3, "threshold": 3, "safe_threshold": 2}
=== RUN   TestCreateCluster/goerli/output
=== RUN   TestCreateCluster/goerli/files
=== RUN   TestCreateCluster/goerli/valid_lock
=== RUN   TestCreateCluster/solo_flow_definition_from_disk
14:18:49.654 INFO           Cluster definition loaded from disk      {"path":
"../cluster/examples/cluster-definition-005.json", "definition_hash":
"0x33a5baad2ce565fd1e46fb7f216a1a408cb947ee1ab942b085878e07063036e2"}
14:18:49.654 WARN           Insecure keystores configured. ONLY DO THIS DURING TESTING
=== RUN   TestCreateCluster/solo_flow_definition_from_disk/output
=== RUN   TestCreateCluster/solo_flow_definition_from_disk/files
=== RUN   TestCreateCluster/solo_flow_definition_from_disk/valid_lock
=== RUN   TestCreateCluster/solo_flow_definition_from_network
14:18:49.696 INFO           Cluster definition downloaded from URL   {"URL": "http://127.0.0.1:52412",
"definition_hash": "0x33a5baad2ce565fd1e46fb7f216a1a408cb947ee1ab942b085878e07063036e2"}
14:18:49.696 WARN           Insecure keystores configured. ONLY DO THIS DURING TESTING
=== RUN   TestCreateCluster/solo_flow_definition_from_network/output
=== RUN   TestCreateCluster/solo_flow_definition_from_network/files
=== RUN   TestCreateCluster/solo_flow_definition_from_network/valid_lock
=== RUN   TestCreateCluster/test_with_fee_recipient_and_withdrawal_addresses
14:18:49.741 WARN           Non standard threshold provided, this will affect cluster safety
{"num_nodes": 3, "threshold": 4, "safe_threshold": 2}
=== RUN   TestCreateCluster/test_with_fee_recipient_and_withdrawal_addresses/output
=== RUN   TestCreateCluster/test_with_fee_recipient_and_withdrawal_addresses/files
=== RUN   TestCreateCluster/test_with_fee_recipient_and_withdrawal_addresses/valid_lock
=== RUN   TestCreateCluster/custom_testnet_flags
=== RUN   TestCreateCluster/custom_testnet_flags/output
=== RUN   TestCreateCluster/custom_testnet_flags/files
=== RUN   TestCreateCluster/custom_testnet_flags/valid_lock
--- PASS: TestCreateCluster (0.50s)
    --- PASS: TestCreateCluster/simnet (0.02s)
        --- PASS: TestCreateCluster/simnet/output (0.00s)
        --- PASS: TestCreateCluster/simnet/files (0.00s)
        --- PASS: TestCreateCluster/simnet/valid_lock (0.00s)
    --- PASS: TestCreateCluster/two_partial_deposits (0.03s)
        --- PASS: TestCreateCluster/two_partial_deposits/output (0.00s)
        --- PASS: TestCreateCluster/two_partial_deposits/files (0.00s)
        --- PASS: TestCreateCluster/two_partial_deposits/valid_lock (0.00s)
    --- PASS: TestCreateCluster/four_partial_deposits (0.03s)
        --- PASS: TestCreateCluster/four_partial_deposits/output (0.00s)
        --- PASS: TestCreateCluster/four_partial_deposits/files (0.00s)
        --- PASS: TestCreateCluster/four_partial_deposits/valid_lock (0.01s)
    --- PASS: TestCreateCluster/splitkeys (0.05s)
        --- PASS: TestCreateCluster/splitkeys/output (0.00s)
        --- PASS: TestCreateCluster/splitkeys/files (0.00s)
        --- PASS: TestCreateCluster/splitkeys/valid_lock (0.01s)
    --- PASS: TestCreateCluster/splitkeys_with_cluster_definition (0.04s)
        --- PASS: TestCreateCluster/splitkeys_with_cluster_definition/output (0.00s)
        --- PASS: TestCreateCluster/splitkeys_with_cluster_definition/files (0.00s)
        --- PASS: TestCreateCluster/splitkeys_with_cluster_definition/valid_lock (0.01s)
```

```
    --- PASS:
TestCreateCluster/splitkeys_with_cluster_definition,_but_amount_of_keys_read_from_disk_differ (0.00s)
    --- PASS: TestCreateCluster/missing_nodes_amount_flag (0.00s)
    --- PASS: TestCreateCluster/missing_network_flag (0.00s)
    --- PASS: TestCreateCluster/missing_numdvs_with_no_split_keys_set (0.00s)
    --- PASS: TestCreateCluster/splitkeys_with_numdvs_set (0.00s)
    --- PASS: TestCreateCluster/goerli (0.03s)
        --- PASS: TestCreateCluster/goerli/output (0.00s)
        --- PASS: TestCreateCluster/goerli/files (0.00s)
        --- PASS: TestCreateCluster/goerli/valid_lock (0.01s)
    --- PASS: TestCreateCluster/solo_flow_definition_from_disk (0.04s)
        --- PASS: TestCreateCluster/solo_flow_definition_from_disk/output (0.00s)
        --- PASS: TestCreateCluster/solo_flow_definition_from_disk/files (0.00s)
        --- PASS: TestCreateCluster/solo_flow_definition_from_disk/valid_lock (0.01s)
    --- PASS: TestCreateCluster/solo_flow_definition_from_network (0.04s)
        --- PASS: TestCreateCluster/solo_flow_definition_from_network/output (0.00s)
        --- PASS: TestCreateCluster/solo_flow_definition_from_network/files (0.00s)
        --- PASS: TestCreateCluster/solo_flow_definition_from_network/valid_lock (0.01s)
    --- PASS: TestCreateCluster/test_with_fee_recipient_and_withdrawal_addresses (0.11s)
        --- PASS: TestCreateCluster/test_with_fee_recipient_and_withdrawal_addresses/output (0.00s)
        --- PASS: TestCreateCluster/test_with_fee_recipient_and_withdrawal_addresses/files (0.00s)
        --- PASS: TestCreateCluster/test_with_fee_recipient_and_withdrawal_addresses/valid_lock (0.01s)
    --- PASS: TestCreateCluster/custom_testnet_flags (0.10s)
        --- PASS: TestCreateCluster/custom_testnet_flags/output (0.00s)
        --- PASS: TestCreateCluster/custom_testnet_flags/files (0.00s)
        --- PASS: TestCreateCluster/custom_testnet_flags/valid_lock (0.01s)
=== RUN   TestValidateDef
14:18:49.951 INFO           Cluster definition loaded from disk      {"path":
"../cluster/examples/cluster-definition-002.json", "definition_hash":
"0x77f105a3e17f96c0c27cba0eb037691c8f7c15fc9b8daf0f62903fd743550f91"}
=== RUN   TestValidateDef/zero_address
=== RUN   TestValidateDef/fork_versions
=== RUN   TestValidateDef/insufficient_keymanager_addresses
=== RUN   TestValidateDef/insecure_keys
14:18:49.951 WARN           Insecure keystores configured. ONLY DO THIS DURING TESTING
=== RUN   TestValidateDef/insufficient_number_of_nodes
=== RUN   TestValidateDef/name_not_provided
=== RUN   TestValidateDef/zero_validators_provided
=== RUN   TestValidateDef/invalid_hash
=== RUN   TestValidateDef/invalid_config_signatures
--- PASS: TestValidateDef (0.00s)
    --- PASS: TestValidateDef/zero_address (0.00s)
    --- PASS: TestValidateDef/fork_versions (0.00s)
    --- PASS: TestValidateDef/insufficient_keymanager_addresses (0.00s)
    --- PASS: TestValidateDef/insecure_keys (0.00s)
    --- PASS: TestValidateDef/insufficient_number_of_nodes (0.00s)
    --- PASS: TestValidateDef/name_not_provided (0.00s)
    --- PASS: TestValidateDef/zero_validators_provided (0.00s)
    --- PASS: TestValidateDef/invalid_hash (0.00s)
    --- PASS: TestValidateDef/invalid_config_signatures (0.00s)
=== RUN   TestSplitKeys
=== RUN   TestSplitKeys/split_keys_from_local_definition
14:18:49.953 INFO           Cluster definition loaded from disk      {"path":
"../cluster/examples/cluster-definition-004.json", "definition_hash":
"0x188630980aea16d9693326ee56c0dee7614c3866c28abe05aafb13b36a56d56e"}
14:18:49.953 WARN           Insecure keystores configured. ONLY DO THIS DURING TESTING
=== RUN   TestSplitKeys/split_keys_from_config_with_one_num-validators
14:18:49.986 WARN           Non standard threshold provided, this will affect cluster safety
{"num_nodes": 3, "threshold": 3, "safe_threshold": 2}
--- PASS: TestSplitKeys (0.11s)
    --- PASS: TestSplitKeys/split_keys_from_local_definition (0.03s)
    --- PASS: TestSplitKeys/split_keys_from_config_with_one_num-validators (0.06s)
=== RUN   TestMultipleAddresses
=== RUN   TestMultipleAddresses/insufficient_fee_recipient_addresses
=== RUN   TestMultipleAddresses/insufficient_withdrawal_addresses
=== RUN   TestMultipleAddresses/insufficient_addresses_from_remote_URL
--- PASS: TestMultipleAddresses (0.02s)
    --- PASS: TestMultipleAddresses/insufficient_fee_recipient_addresses (0.00s)
    --- PASS: TestMultipleAddresses/insufficient_withdrawal_addresses (0.00s)
    --- PASS: TestMultipleAddresses/insufficient_addresses_from_remote_URL (0.02s)
=== RUN   TestKeymanager
=== RUN   TestKeymanager/all_successful
```

```
14:18:50.083 WARN            Keymanager URL does not use https protocol {"addr":
"http://127.0.0.1:52455"}
14:18:50.083 WARN            Keymanager URL does not use https protocol {"addr":
"http://127.0.0.1:52456"}
14:18:50.083 WARN            Keymanager URL does not use https protocol {"addr":
"http://127.0.0.1:52457"}
14:18:50.086 INFO            Imported key shares to keymanager        {"node": "node0", "addr":
"http://127.0.0.1:52455"}
14:18:50.086 INFO            Imported key shares to keymanager        {"node": "node1", "addr":
"http://127.0.0.1:52456"}
14:18:50.087 INFO            Imported key shares to keymanager        {"node": "node2", "addr":
"http://127.0.0.1:52457"}
14:18:50.087 INFO            Imported all validator keys to respective keymanagers
=== RUN   TestKeymanager/some_unsuccessful
14:18:50.099 WARN            Keymanager URL does not use https protocol {"addr":
"http://127.0.0.1:52455"}
14:18:50.099 WARN            Keymanager URL does not use https protocol {"addr":
"http://127.0.0.1:52456"}
14:18:50.099 WARN            Keymanager URL does not use https protocol {"addr":
"http://127.0.0.1:52457"}
14:18:50.101 ERRO            : cannot ping address: dial tcp 127.0.0.1:52455: connect: connection refused
{"addr": "http://127.0.0.1:52455"}
    eth2util/keymanager/keymanager.go:72 .VerifyConnection
    cmd/createcluster.go:709 .writeKeysToKeymanager
    cmd/createcluster.go:237 .runCreateCluster
    cmd/createcluster_internal_test.go:685 .func3
=== RUN   TestKeymanager/lengths_don't_match
--- PASS: TestKeymanager (0.02s)
    --- PASS: TestKeymanager/all_successful (0.01s)
    --- PASS: TestKeymanager/some_unsuccessful (0.01s)
    --- PASS: TestKeymanager/lengths_don't_match (0.00s)
=== RUN   TestPublish
=== RUN   TestPublish/upload_successful
14:18:50.118 INFO            Published lock file                      {"addr": "http://127.0.0.1:52465"}
14:18:50.120 INFO            You can find your newly-created cluster dashboard here:
http://127.0.0.1:52465/lock/0xF1B8D62C64F71C5C9B08BF5EC5B761474AE960FBB05BF87BA4890C92BD5C4139/launchpad
--- PASS: TestPublish (0.04s)
    --- PASS: TestPublish/upload_successful (0.02s)
=== RUN   TestCreateDkgValid
14:18:50.141 INFO            Charon create DKG starting               {"version": "v0.20.0-dev",
"git_commit_hash": "unknown", "git_commit_time": "unknown"}
--- PASS: TestCreateDkgValid (0.01s)
=== RUN   TestCreateDkgInvalid
=== RUN   TestCreateDkgInvalid/invalid_ENR:_missing_'enr:'_prefix
14:18:50.155 INFO            Charon create DKG starting               {"version": "v0.20.0-dev",
"git_commit_hash": "unknown", "git_commit_time": "unknown"}
=== RUN   TestCreateDkgInvalid/invalid_ENR:_invalid_enr_record,_too_few_elements
14:18:50.155 INFO            Charon create DKG starting               {"version": "v0.20.0-dev",
"git_commit_hash": "unknown", "git_commit_time": "unknown"}
=== RUN   TestCreateDkgInvalid/invalid_ENR:_missing_'enr:'_prefix#01
14:18:50.155 INFO            Charon create DKG starting               {"version": "v0.20.0-dev",
"git_commit_hash": "unknown", "git_commit_time": "unknown"}
=== RUN   TestCreateDkgInvalid/invalid_ENR:_missing_'enr:'_prefix#02
14:18:50.155 INFO            Charon create DKG starting               {"version": "v0.20.0-dev",
"git_commit_hash": "unknown", "git_commit_time": "unknown"}
=== RUN   TestCreateDkgInvalid/insufficient_operator_ENRs
=== RUN   TestCreateDkgInvalid/insufficient_operator_ENRs#01
--- PASS: TestCreateDkgInvalid (0.00s)
    --- PASS: TestCreateDkgInvalid/invalid_ENR:_missing_'enr:'_prefix (0.00s)
    --- PASS: TestCreateDkgInvalid/invalid_ENR:_invalid_enr_record,_too_few_elements (0.00s)
    --- PASS: TestCreateDkgInvalid/invalid_ENR:_missing_'enr:'_prefix#01 (0.00s)
    --- PASS: TestCreateDkgInvalid/invalid_ENR:_missing_'enr:'_prefix#02 (0.00s)
    --- PASS: TestCreateDkgInvalid/insufficient_operator_ENRs (0.00s)
    --- PASS: TestCreateDkgInvalid/insufficient_operator_ENRs#01 (0.00s)
=== RUN   TestRequireOperatorENRFlag
=== RUN   TestRequireOperatorENRFlag/no_operator_ENRs
Error: required flag(s) "operator-enrs" not set
=== RUN   TestRequireOperatorENRFlag/operator_ENRs_less_than_threshold
Error: insufficient operator ENRs
--- PASS: TestRequireOperatorENRFlag (0.00s)
    --- PASS: TestRequireOperatorENRFlag/no_operator_ENRs (0.00s)
    --- PASS: TestRequireOperatorENRFlag/operator_ENRs_less_than_threshold (0.00s)
```

```
=== RUN   TestExistingClusterDefinition
14:18:50.156 INFO           Charon create DKG starting              {"version": "v0.20.0-dev",
"git_commit_hash": "unknown", "git_commit_time": "unknown"}
Error: existing cluster-definition.json found. Try again after deleting it
--- PASS: TestExistingClusterDefinition (0.01s)
=== RUN   TestValidateWithdrawalAddr
=== RUN   TestValidateWithdrawalAddr/ok
=== RUN   TestValidateWithdrawalAddr/invalid_network
=== RUN   TestValidateWithdrawalAddr/invalid_withdrawal_address
=== RUN   TestValidateWithdrawalAddr/invalid_checksum
--- PASS: TestValidateWithdrawalAddr (0.00s)
    --- PASS: TestValidateWithdrawalAddr/ok (0.00s)
    --- PASS: TestValidateWithdrawalAddr/invalid_network (0.00s)
    --- PASS: TestValidateWithdrawalAddr/invalid_withdrawal_address (0.00s)
    --- PASS: TestValidateWithdrawalAddr/invalid_checksum (0.00s)
=== RUN   TestValidateDKGConfig
=== RUN   TestValidateDKGConfig/invalid_threshold
=== RUN   TestValidateDKGConfig/insufficient_ENRs
=== RUN   TestValidateDKGConfig/invalid_network
=== RUN   TestValidateDKGConfig/wrong_deposit_amounts_sum
--- PASS: TestValidateDKGConfig (0.00s)
    --- PASS: TestValidateDKGConfig/invalid_threshold (0.00s)
    --- PASS: TestValidateDKGConfig/insufficient_ENRs (0.00s)
    --- PASS: TestValidateDKGConfig/invalid_network (0.00s)
    --- PASS: TestValidateDKGConfig/wrong_deposit_amounts_sum (0.00s)
=== RUN   TestRunCreateEnr
--- PASS: TestRunCreateEnr (0.00s)
=== RUN   Test_bindDebugMonitoringFlags
=== RUN   Test_bindDebugMonitoringFlags/both_present
=== RUN   Test_bindDebugMonitoringFlags/only_monitor
=== RUN   Test_bindDebugMonitoringFlags/only_debug
--- PASS: Test_bindDebugMonitoringFlags (0.00s)
    --- PASS: Test_bindDebugMonitoringFlags/both_present (0.00s)
    --- PASS: Test_bindDebugMonitoringFlags/only_monitor (0.00s)
    --- PASS: Test_bindDebugMonitoringFlags/only_debug (0.00s)
=== RUN   TestRunNewEnr
--- PASS: TestRunNewEnr (0.00s)
=== RUN   TestConfigReference
--- PASS: TestConfigReference (0.00s)
=== RUN   TestMetricReference
--- PASS: TestMetricReference (0.00s)
=== RUN   TestTrackerReasonReference
--- PASS: TestTrackerReasonReference (0.80s)
=== RUN   TestBindPrivKeyFlag
=== RUN   TestBindPrivKeyFlag/privKeyFile_flag_present/default_and_file_exists
14:18:50.981 INFO           This software is licensed under the Maria DB Business Source License 1.1;
you may not use this software except in compliance with this license. You may obtain a copy of this
license at https://github.com/ObolNetwork/charon/blob/main/LICENSE
14:18:50.981 INFO           Parsed config                           {"beacon-node-endpoints": "
[http://beacon.node]", "builder-api": "false", "debug-address": "", "feature-set": "stable", "feature-
set-disable": "[]", "feature-set-enable": "[]", "help": "false", "jaeger-address": "", "jaeger-service":
"charon", "lock-file": ".charon/cluster-lock.json", "log-color": "auto", "log-format": "console", "log-
level": "info", "log-output-path": "", "loki-addresses": "[]", "loki-service": "charon", "manifest-file":
".charon/cluster-manifest.pb", "monitoring-address": "127.0.0.1:3620", "no-verify": "false", "p2p-
disable-reuseport": "false", "p2p-external-hostname": "", "p2p-external-ip": "", "p2p-relays": "
[https://0.relay.obol.tech,https://1.relay.obol.tech]", "p2p-tcp-address": "[]", "private-key-file":
".charon/charon-enr-private-key", "private-key-file-lock": "false", "simnet-beacon-mock": "false",
"simnet-beacon-mock-fuzz": "false", "simnet-slot-duration": "1s", "simnet-validator-keys-dir":
".charon/validator_keys", "simnet-validator-mock": "false", "synthetic-block-proposals": "false",
"testnet-chain-id": "0", "testnet-fork-version": "", "testnet-genesis-timestamp": "0", "testnet-name":
"", "validator-api-address": "127.0.0.1:3600"}
--- PASS: TestBindPrivKeyFlag (0.00s)
    --- PASS: TestBindPrivKeyFlag/privKeyFile_flag_present/default_and_file_exists (0.00s)
=== RUN   Test_viewClusterManifest
--- PASS: Test_viewClusterManifest (0.03s)
PASS
coverage: 40.3% of statements
ok      github.com/obolnetwork/charon/cmd   2.387s  coverage: 40.3% of statements
    github.com/obolnetwork/charon/dkg/dkgpb/v1      coverage: 0.0% of statements
=== RUN   TestCombineNoLockfile
14:18:49.177 [34mINFO [0m [32m          [0m Recombining private key shares          {"input_dir":
"/var/folders/h1/f0qvvxw53c72tk0z4_fgyms00000gn/T/TestCombineNoLockfile3356956087/001", "output_dir":
```

```
"/var/folders/h1/f0qvvxw53c72tk0z4_fgyms00000gn/T/TestCombineNoLockfile3356956087/002"}
--- PASS: TestCombineNoLockfile (0.00s)
=== RUN   TestCombineCannotLoadKeystore
14:18:49.205 [34mINFO [0m [32m          [0m Recombining private key shares          {"input_dir":
"/var/folders/h1/f0qvvxw53c72tk0z4_fgyms00000gn/T/TestCombineCannotLoadKeystore133231428/001",
"output_dir":
"/var/folders/h1/f0qvvxw53c72tk0z4_fgyms00000gn/T/TestCombineCannotLoadKeystore133231428/002"}
14:18:49.228 [34mINFO [0m [32m          [0m Loading keystore                        {"path":
"/var/folders/h1/f0qvvxw53c72tk0z4_fgyms00000gn/T/TestCombineCannotLoadKeystore133231428/001/node2/valida
tor_keys"}
14:18:49.228 [34mINFO [0m [32m          [0m Loading keystore                        {"path":
"/var/folders/h1/f0qvvxw53c72tk0z4_fgyms00000gn/T/TestCombineCannotLoadKeystore133231428/001/node3/valida
tor_keys"}
--- PASS: TestCombineCannotLoadKeystore (0.07s)
=== RUN   TestCombineAllManifest
--- PASS: TestCombineCustomNetworkFork (2.59s)
=== RUN   TestCombineBothManifestAndLockForAll
--- PASS: TestCombineBothManifestAndLockForAll (2.93s)
=== RUN   TestCombineBothManifestAndLockForSome
--- PASS: TestCombineBothManifestAndLockForSome (2.18s)
=== RUN   TestCombineLotsOfVals
--- PASS: TestCombineLotsOfVals (1.93s)
=== RUN   TestCombine
--- PASS: TestCombineNoVerifyGoodLock (0.08s)
=== RUN   TestCombineNoVerifyBadLock
--- PASS: TestCombineNoVerifyBadLock (0.08s)
=== RUN   TestCombineBadLock
--- PASS: TestCombineBadLock (0.03s)
=== RUN   TestCombineNoVerifyDifferentValidatorData
--- PASS: TestCombineNoVerifyDifferentValidatorData (0.12s)
=== RUN   TestCombineTwiceWithoutForceFails
--- PASS: TestCombineTwiceWithoutForceFails (0.17s)
=== RUN   TestCombineTwiceWithForceSucceedes
--- PASS: TestCombineTwiceWithForceSucceedes (0.14s)
PASS
coverage: 21.5% of statements
ok      github.com/obolnetwork/charon/cmd/combine   12.577s coverage: 21.5% of statements
=== RUN   TestHex7
=== RUN   TestHex7/more_than_7_characters
=== RUN   TestHex7/less_than_7_characters
--- PASS: TestHex7 (0.00s)
    --- PASS: TestHex7/more_than_7_characters (0.00s)
    --- PASS: TestHex7/less_than_7_characters (0.00s)
=== RUN   TestRunBootnode
--- PASS: TestRunBootnode (0.03s)
=== RUN   TestRunBootnodeAutoP2P
--- PASS: TestRunBootnodeAutoP2P (0.03s)
=== RUN   TestServeAddrs
=== RUN   TestServeAddrs/multiaddrs
=== RUN   TestServeAddrs/enr
=== RUN   TestServeAddrs/enr_ext_ip
=== RUN   TestServeAddrs/enr_ext_host
--- PASS: TestServeAddrs (0.46s)
    --- PASS: TestServeAddrs/multiaddrs (0.12s)
    --- PASS: TestServeAddrs/enr (0.11s)
    --- PASS: TestServeAddrs/enr_ext_ip (0.11s)
    --- PASS: TestServeAddrs/enr_ext_host (0.11s)
PASS
coverage: 21.9% of statements
ok      github.com/obolnetwork/charon/cmd/relay 1.628s  coverage: 21.9% of statements
=== RUN   TestDeadliner
--- PASS: TestDeadliner (0.00s)
=== RUN   TestVerifyEth2SignedData
=== RUN   TestVerifyEth2SignedData/verify_attestation
=== RUN   TestVerifyEth2SignedData/verify_beacon_block
=== RUN   TestVerifyEth2SignedData/verify_blinded_beacon_block_bellatrix
=== RUN   TestVerifyEth2SignedData/verify_blinded_beacon_block_capella
=== RUN   TestVerifyEth2SignedData/verify_blinded_beacon_block_deneb
=== RUN   TestVerifyEth2SignedData/verify_randao
=== RUN   TestVerifyEth2SignedData/verify_voluntary_exit
=== RUN   TestVerifyEth2SignedData/verify_registration
=== RUN   TestVerifyEth2SignedData/verify_beacon_committee_selection
```

```
=== RUN   TestVerifyEth2SignedData/verify_attestation_aggregate_and_proof
=== RUN   TestVerifyEth2SignedData/verify_sync_committee_message
=== RUN   TestVerifyEth2SignedData/verify_sync_committee_contribution_and_proof
=== RUN   TestVerifyEth2SignedData/verify_sync_committee_selection
=== RUN   TestVerifyEth2SignedData/verify_sync_committee_selection#01
=== RUN   TestVerifyEth2SignedData/verify_sync_contribution_and_proof
--- PASS: TestVerifyEth2SignedData (0.10s)
    --- PASS: TestVerifyEth2SignedData/verify_attestation (0.01s)
    --- PASS: TestVerifyEth2SignedData/verify_beacon_block (0.01s)
    --- PASS: TestVerifyEth2SignedData/verify_blinded_beacon_block_bellatrix (0.00s)
    --- PASS: TestVerifyEth2SignedData/verify_blinded_beacon_block_capella (0.02s)
    --- PASS: TestVerifyEth2SignedData/verify_blinded_beacon_block_deneb (0.00s)
    --- PASS: TestVerifyEth2SignedData/verify_randao (0.01s)
    --- PASS: TestVerifyEth2SignedData/verify_voluntary_exit (0.00s)
    --- PASS: TestVerifyEth2SignedData/verify_registration (0.00s)
    --- PASS: TestVerifyEth2SignedData/verify_beacon_committee_selection (0.00s)
    --- PASS: TestVerifyEth2SignedData/verify_attestation_aggregate_and_proof (0.00s)
    --- PASS: TestVerifyEth2SignedData/verify_sync_committee_message (0.00s)
    --- PASS: TestVerifyEth2SignedData/verify_sync_committee_contribution_and_proof (0.00s)
    --- PASS: TestVerifyEth2SignedData/verify_sync_committee_selection (0.00s)
    --- PASS: TestVerifyEth2SignedData/verify_sync_committee_selection#01 (0.01s)
    --- PASS: TestVerifyEth2SignedData/verify_sync_contribution_and_proof (0.01s)
=== RUN   TestDutyGater
--- PASS: TestDutyGater (0.00s)
=== RUN   TestDutyProto
--- PASS: TestDutyProto (0.00s)
=== RUN   TestParSignedDataSetProto
=== RUN   TestParSignedDataSetProto/attester
=== RUN   TestParSignedDataSetProto/exit
=== RUN   TestParSignedDataSetProto/proposer
=== RUN   TestParSignedDataSetProto/proposer#01
=== RUN   TestParSignedDataSetProto/proposer#02
=== RUN   TestParSignedDataSetProto/builder_proposer
=== RUN   TestParSignedDataSetProto/builder_proposer#01
=== RUN   TestParSignedDataSetProto/builder_proposer#02
=== RUN   TestParSignedDataSetProto/builder_registration
=== RUN   TestParSignedDataSetProto/prepare_aggregator
=== RUN   TestParSignedDataSetProto/aggregator
=== RUN   TestParSignedDataSetProto/sync_message
=== RUN   TestParSignedDataSetProto/prepare_sync_contribution
=== RUN   TestParSignedDataSetProto/sync_contribution
--- PASS: TestParSignedDataSetProto (0.00s)
    --- PASS: TestParSignedDataSetProto/attester (0.00s)
    --- PASS: TestParSignedDataSetProto/exit (0.00s)
    --- PASS: TestParSignedDataSetProto/proposer (0.00s)
    --- PASS: TestParSignedDataSetProto/proposer#01 (0.00s)
    --- PASS: TestParSignedDataSetProto/proposer#02 (0.00s)
    --- PASS: TestParSignedDataSetProto/builder_proposer (0.00s)
    --- PASS: TestParSignedDataSetProto/builder_proposer#01 (0.00s)
    --- PASS: TestParSignedDataSetProto/builder_proposer#02 (0.00s)
    --- PASS: TestParSignedDataSetProto/builder_registration (0.00s)
    --- PASS: TestParSignedDataSetProto/prepare_aggregator (0.00s)
    --- PASS: TestParSignedDataSetProto/aggregator (0.00s)
    --- PASS: TestParSignedDataSetProto/sync_message (0.00s)
    --- PASS: TestParSignedDataSetProto/prepare_sync_contribution (0.00s)
    --- PASS: TestParSignedDataSetProto/sync_contribution (0.00s)
=== RUN   TestUnsignedDataToProto
=== RUN   TestUnsignedDataToProto/attester
=== RUN   TestUnsignedDataToProto/proposer
=== RUN   TestUnsignedDataToProto/builder_proposer
=== RUN   TestUnsignedDataToProto/aggregator
=== RUN   TestUnsignedDataToProto/sync_contribution
--- PASS: TestUnsignedDataToProto (0.00s)
    --- PASS: TestUnsignedDataToProto/attester (0.00s)
    --- PASS: TestUnsignedDataToProto/proposer (0.00s)
    --- PASS: TestUnsignedDataToProto/builder_proposer (0.00s)
    --- PASS: TestUnsignedDataToProto/aggregator (0.00s)
    --- PASS: TestUnsignedDataToProto/sync_contribution (0.00s)
=== RUN   TestParSignedData
=== RUN   TestParSignedData/sync_contribution
=== RUN   TestParSignedData/attester
=== RUN   TestParSignedData/exit
```

```
=== RUN   TestParSignedData/randao
=== RUN   TestParSignedData/proposer
=== RUN   TestParSignedData/prepare_aggregator
=== RUN   TestParSignedData/aggregator
=== RUN   TestParSignedData/prepare_sync_contribution
--- PASS: TestParSignedData (0.00s)
    --- PASS: TestParSignedData/sync_contribution (0.00s)
    --- PASS: TestParSignedData/attester (0.00s)
    --- PASS: TestParSignedData/exit (0.00s)
    --- PASS: TestParSignedData/randao (0.00s)
    --- PASS: TestParSignedData/proposer (0.00s)
    --- PASS: TestParSignedData/prepare_aggregator (0.00s)
    --- PASS: TestParSignedData/aggregator (0.00s)
    --- PASS: TestParSignedData/prepare_sync_contribution (0.00s)
=== RUN   TestSetSignature
=== RUN   TestSetSignature/randao
=== RUN   TestSetSignature/proposer
=== RUN   TestSetSignature/prepare_aggregator
=== RUN   TestSetSignature/aggregator
=== RUN   TestSetSignature/prepare_sync_contribution
=== RUN   TestSetSignature/sync_contribution
=== RUN   TestSetSignature/attester
=== RUN   TestSetSignature/exit
--- PASS: TestSetSignature (0.00s)
    --- PASS: TestSetSignature/randao (0.00s)
    --- PASS: TestSetSignature/proposer (0.00s)
    --- PASS: TestSetSignature/prepare_aggregator (0.00s)
    --- PASS: TestSetSignature/aggregator (0.00s)
    --- PASS: TestSetSignature/prepare_sync_contribution (0.00s)
    --- PASS: TestSetSignature/sync_contribution (0.00s)
    --- PASS: TestSetSignature/attester (0.00s)
    --- PASS: TestSetSignature/exit (0.00s)
=== RUN   TestMarshalAttestation
--- PASS: TestMarshalAttestation (0.00s)
=== RUN   TestNilPointerChecks
--- PASS: TestNilPointerChecks (0.00s)
=== RUN   TestJSONSerialisation
=== RUN   TestJSONSerialisation/VersionedSignedProposal.json
=== RUN   TestJSONSerialisation/Attestation.json
=== RUN   TestJSONSerialisation/Signature.json
=== RUN   TestJSONSerialisation/SignedVoluntaryExit.json
=== RUN   TestJSONSerialisation/VersionedSignedBlindedProposal.json
=== RUN   TestJSONSerialisation/SignedRandao.json
=== RUN   TestJSONSerialisation/BeaconCommitteeSelection.json
=== RUN   TestJSONSerialisation/SignedAggregateAndProof.json
=== RUN   TestJSONSerialisation/SignedSyncMessage.json
=== RUN   TestJSONSerialisation/SyncContributionAndProof.json
=== RUN   TestJSONSerialisation/SignedSyncContributionAndProof.json
=== RUN   TestJSONSerialisation/SyncCommitteeSelection.json
=== RUN   TestJSONSerialisation/AttestationData.json
=== RUN   TestJSONSerialisation/AggregatedAttestation.json
=== RUN   TestJSONSerialisation/VersionedProposal.json
=== RUN   TestJSONSerialisation/VersionedBlindedProposal.json
=== RUN   TestJSONSerialisation/SyncContribution.json
--- PASS: TestJSONSerialisation (0.01s)
    --- PASS: TestJSONSerialisation/VersionedSignedProposal.json (0.00s)
    --- PASS: TestJSONSerialisation/Attestation.json (0.00s)
    --- PASS: TestJSONSerialisation/Signature.json (0.00s)
    --- PASS: TestJSONSerialisation/SignedVoluntaryExit.json (0.00s)
    --- PASS: TestJSONSerialisation/VersionedSignedBlindedProposal.json (0.00s)
    --- PASS: TestJSONSerialisation/SignedRandao.json (0.00s)
    --- PASS: TestJSONSerialisation/BeaconCommitteeSelection.json (0.00s)
    --- PASS: TestJSONSerialisation/SignedAggregateAndProof.json (0.00s)
    --- PASS: TestJSONSerialisation/SignedSyncMessage.json (0.00s)
    --- PASS: TestJSONSerialisation/SyncContributionAndProof.json (0.00s)
    --- PASS: TestJSONSerialisation/SignedSyncContributionAndProof.json (0.00s)
    --- PASS: TestJSONSerialisation/SyncCommitteeSelection.json (0.00s)
    --- PASS: TestJSONSerialisation/AttestationData.json (0.00s)
    --- PASS: TestJSONSerialisation/AggregatedAttestation.json (0.00s)
    --- PASS: TestJSONSerialisation/VersionedProposal.json (0.00s)
    --- PASS: TestJSONSerialisation/VersionedBlindedProposal.json (0.00s)
    --- PASS: TestJSONSerialisation/SyncContribution.json (0.00s)
```

```
=== RUN   TestSignedDataSetSignature
=== RUN   TestSignedDataSetSignature/versioned_signed_proposal
=== RUN   TestSignedDataSetSignature/versioned_signed_blinded_proposal_bellatrix
=== RUN   TestSignedDataSetSignature/versioned_signed_blinded_proposal_capella
=== RUN   TestSignedDataSetSignature/versioned_signed_blinded_proposal_deneb
=== RUN   TestSignedDataSetSignature/signed_beacon_committee_selection
=== RUN   TestSignedDataSetSignature/signed_aggregate_and_proof
=== RUN   TestSignedDataSetSignature/signed_sync_committee_message
=== RUN   TestSignedDataSetSignature/signed_sync_contribution
=== RUN   TestSignedDataSetSignature/signed_sync_committee_selection
--- PASS: TestSignedDataSetSignature (0.00s)
    --- PASS: TestSignedDataSetSignature/versioned_signed_proposal (0.00s)
    --- PASS: TestSignedDataSetSignature/versioned_signed_blinded_proposal_bellatrix (0.00s)
    --- PASS: TestSignedDataSetSignature/versioned_signed_blinded_proposal_capella (0.00s)
    --- PASS: TestSignedDataSetSignature/versioned_signed_blinded_proposal_deneb (0.00s)
    --- PASS: TestSignedDataSetSignature/signed_beacon_committee_selection (0.00s)
    --- PASS: TestSignedDataSetSignature/signed_aggregate_and_proof (0.00s)
    --- PASS: TestSignedDataSetSignature/signed_sync_committee_message (0.00s)
    --- PASS: TestSignedDataSetSignature/signed_sync_contribution (0.00s)
    --- PASS: TestSignedDataSetSignature/signed_sync_committee_selection (0.00s)
=== RUN   TestMarshalSubscription
--- PASS: TestMarshalSubscription (0.00s)
=== RUN   TestSSZSerialisation
=== RUN   TestSSZSerialisation/VersionedSignedProposal.ssz
=== RUN   TestSSZSerialisation/Attestation.ssz
=== NAME  TestSSZSerialisation
    ssz_test.go:32: Skipping non SSZ type: Signature.ssz
=== RUN   TestSSZSerialisation/SignedVoluntaryExit.ssz
=== RUN   TestSSZSerialisation/VersionedSignedBlindedProposal.ssz
=== NAME  TestSSZSerialisation
    ssz_test.go:32: Skipping non SSZ type: SignedRandao.ssz
    ssz_test.go:32: Skipping non SSZ type: BeaconCommitteeSelection.ssz
=== RUN   TestSSZSerialisation/SignedAggregateAndProof.ssz
=== RUN   TestSSZSerialisation/SignedSyncMessage.ssz
=== RUN   TestSSZSerialisation/SyncContributionAndProof.ssz
=== RUN   TestSSZSerialisation/SignedSyncContributionAndProof.ssz
=== NAME  TestSSZSerialisation
    ssz_test.go:32: Skipping non SSZ type: SyncCommitteeSelection.ssz
=== RUN   TestSSZSerialisation/AttestationData.ssz
=== RUN   TestSSZSerialisation/AggregatedAttestation.ssz
=== RUN   TestSSZSerialisation/VersionedProposal.ssz
=== RUN   TestSSZSerialisation/VersionedBlindedProposal.ssz
=== RUN   TestSSZSerialisation/SyncContribution.ssz
--- PASS: TestSSZSerialisation (0.01s)
    --- PASS: TestSSZSerialisation/VersionedSignedProposal.ssz (0.00s)
    --- PASS: TestSSZSerialisation/Attestation.ssz (0.00s)
    --- PASS: TestSSZSerialisation/SignedVoluntaryExit.ssz (0.00s)
    --- PASS: TestSSZSerialisation/VersionedSignedBlindedProposal.ssz (0.00s)
    --- PASS: TestSSZSerialisation/SignedAggregateAndProof.ssz (0.00s)
    --- PASS: TestSSZSerialisation/SignedSyncMessage.ssz (0.00s)
    --- PASS: TestSSZSerialisation/SyncContributionAndProof.ssz (0.00s)
    --- PASS: TestSSZSerialisation/SignedSyncContributionAndProof.ssz (0.00s)
    --- PASS: TestSSZSerialisation/AttestationData.ssz (0.00s)
    --- PASS: TestSSZSerialisation/AggregatedAttestation.ssz (0.00s)
    --- PASS: TestSSZSerialisation/VersionedProposal.ssz (0.00s)
    --- PASS: TestSSZSerialisation/VersionedBlindedProposal.ssz (0.00s)
    --- PASS: TestSSZSerialisation/SyncContribution.ssz (0.00s)
=== RUN   TestSSZ
=== RUN   TestSSZ/*core.VersionedSignedProposal
=== RUN   TestSSZ/*core.Attestation
=== RUN   TestSSZ/*core.VersionedSignedBlindedProposal
=== RUN   TestSSZ/*core.SignedAggregateAndProof
=== RUN   TestSSZ/*core.SignedSyncMessage
=== RUN   TestSSZ/*core.SyncContributionAndProof
=== RUN   TestSSZ/*core.SignedSyncContributionAndProof
=== RUN   TestSSZ/*core.AggregatedAttestation
=== RUN   TestSSZ/*core.VersionedProposal
=== RUN   TestSSZ/*core.VersionedBlindedProposal
=== RUN   TestSSZ/*core.SyncContribution
--- PASS: TestSSZ (0.00s)
    --- PASS: TestSSZ/*core.VersionedSignedProposal (0.00s)
    --- PASS: TestSSZ/*core.Attestation (0.00s)
```

```
    --- PASS: TestSSZ/*core.VersionedSignedBlindedProposal (0.00s)
    --- PASS: TestSSZ/*core.SignedAggregateAndProof (0.00s)
    --- PASS: TestSSZ/*core.SignedSyncMessage (0.00s)
    --- PASS: TestSSZ/*core.SyncContributionAndProof (0.00s)
    --- PASS: TestSSZ/*core.SignedSyncContributionAndProof (0.00s)
    --- PASS: TestSSZ/*core.AggregatedAttestation (0.00s)
    --- PASS: TestSSZ/*core.VersionedProposal (0.00s)
    --- PASS: TestSSZ/*core.VersionedBlindedProposal (0.00s)
    --- PASS: TestSSZ/*core.SyncContribution (0.00s)
=== RUN   TestMarshalUnsignedProto
=== RUN   TestMarshalUnsignedProto/*core.AttestationData_true
=== RUN   TestMarshalUnsignedProto/*core.AggregatedAttestation_true
=== RUN   TestMarshalUnsignedProto/*core.VersionedProposal_true
=== RUN   TestMarshalUnsignedProto/*core.VersionedBlindedProposal_true
=== RUN   TestMarshalUnsignedProto/*core.SyncContribution_true
=== RUN   TestMarshalUnsignedProto/*core.AttestationData_false
=== RUN   TestMarshalUnsignedProto/*core.AggregatedAttestation_false
=== RUN   TestMarshalUnsignedProto/*core.VersionedProposal_false
=== RUN   TestMarshalUnsignedProto/*core.VersionedBlindedProposal_false
=== RUN   TestMarshalUnsignedProto/*core.SyncContribution_false
=== NAME  TestMarshalUnsignedProto
    ssz_test.go:167: *core.AttestationData: ssz (338) vs json (887) == 38%
    ssz_test.go:167: *core.AggregatedAttestation: ssz (336) vs json (734) == 46%
    ssz_test.go:167: *core.VersionedProposal: ssz (5362) vs json (14248) == 38%
    ssz_test.go:167: *core.VersionedBlindedProposal: ssz (5160) vs json (13533) == 38%
    ssz_test.go:167: *core.SyncContribution: ssz (266) vs json (532) == 50%
--- PASS: TestMarshalUnsignedProto (0.01s)
    --- PASS: TestMarshalUnsignedProto/*core.AttestationData_true (0.00s)
    --- PASS: TestMarshalUnsignedProto/*core.AggregatedAttestation_true (0.00s)
    --- PASS: TestMarshalUnsignedProto/*core.VersionedProposal_true (0.00s)
    --- PASS: TestMarshalUnsignedProto/*core.VersionedBlindedProposal_true (0.00s)
    --- PASS: TestMarshalUnsignedProto/*core.SyncContribution_true (0.00s)
    --- PASS: TestMarshalUnsignedProto/*core.AttestationData_false (0.00s)
    --- PASS: TestMarshalUnsignedProto/*core.AggregatedAttestation_false (0.00s)
    --- PASS: TestMarshalUnsignedProto/*core.VersionedProposal_false (0.00s)
    --- PASS: TestMarshalUnsignedProto/*core.VersionedBlindedProposal_false (0.00s)
    --- PASS: TestMarshalUnsignedProto/*core.SyncContribution_false (0.00s)
=== RUN   TestMarshalParSignedProto
=== RUN   TestMarshalParSignedProto/*core.Attestation_true
=== RUN   TestMarshalParSignedProto/*core.SignedAggregateAndProof_true
=== RUN   TestMarshalParSignedProto/*core.VersionedSignedProposal_true
=== RUN   TestMarshalParSignedProto/*core.VersionedSignedBlindedProposal_true
=== RUN   TestMarshalParSignedProto/*core.SignedSyncContributionAndProof_true
=== RUN   TestMarshalParSignedProto/*core.Attestation_false
=== RUN   TestMarshalParSignedProto/*core.SignedAggregateAndProof_false
=== RUN   TestMarshalParSignedProto/*core.VersionedSignedProposal_false
=== RUN   TestMarshalParSignedProto/*core.VersionedSignedBlindedProposal_false
=== RUN   TestMarshalParSignedProto/*core.SignedSyncContributionAndProof_false
=== NAME  TestMarshalParSignedProto
    ssz_test.go:248: *core.Attestation: ssz (445) vs json (851) == 52.29%
    ssz_test.go:248: *core.SignedAggregateAndProof: ssz (646) vs json (1333) == 48.46%
    ssz_test.go:248: *core.VersionedSignedProposal: ssz (3757) vs json (9750) == 38.53%
    ssz_test.go:248: *core.VersionedSignedBlindedProposal: ssz (7245) vs json (19019) == 38.09%
    ssz_test.go:248: *core.SignedSyncContributionAndProof: ssz (569) vs json (1130) == 50.35%
--- PASS: TestMarshalParSignedProto (0.01s)
    --- PASS: TestMarshalParSignedProto/*core.Attestation_true (0.00s)
    --- PASS: TestMarshalParSignedProto/*core.SignedAggregateAndProof_true (0.00s)
    --- PASS: TestMarshalParSignedProto/*core.VersionedSignedProposal_true (0.00s)
    --- PASS: TestMarshalParSignedProto/*core.VersionedSignedBlindedProposal_true (0.00s)
    --- PASS: TestMarshalParSignedProto/*core.SignedSyncContributionAndProof_true (0.00s)
    --- PASS: TestMarshalParSignedProto/*core.Attestation_false (0.00s)
    --- PASS: TestMarshalParSignedProto/*core.SignedAggregateAndProof_false (0.00s)
    --- PASS: TestMarshalParSignedProto/*core.VersionedSignedProposal_false (0.00s)
    --- PASS: TestMarshalParSignedProto/*core.VersionedSignedBlindedProposal_false (0.00s)
    --- PASS: TestMarshalParSignedProto/*core.SignedSyncContributionAndProof_false (0.00s)
=== RUN   TestBackwardsCompatability
--- PASS: TestBackwardsCompatability (0.00s)
=== RUN   TestWithDutySpanCtx
--- PASS: TestWithDutySpanCtx (0.00s)
=== RUN   TestUnsignedDataClone
=== RUN   TestUnsignedDataClone/attestation_data
=== RUN   TestUnsignedDataClone/versioned_beacon_block_bellatrix
```

```
=== RUN   TestUnsignedDataClone/versioned_blinded_beacon_block_bellatrix
=== RUN   TestUnsignedDataClone/versioned_beacon_block_capella
=== RUN   TestUnsignedDataClone/versioned_blinded_beacon_block_capella
=== RUN   TestUnsignedDataClone/aggregated_attestation
=== RUN   TestUnsignedDataClone/sync_contribution
--- PASS: TestUnsignedDataClone (0.00s)
    --- PASS: TestUnsignedDataClone/attestation_data (0.00s)
    --- PASS: TestUnsignedDataClone/versioned_beacon_block_bellatrix (0.00s)
    --- PASS: TestUnsignedDataClone/versioned_blinded_beacon_block_bellatrix (0.00s)
    --- PASS: TestUnsignedDataClone/versioned_beacon_block_capella (0.00s)
    --- PASS: TestUnsignedDataClone/versioned_blinded_beacon_block_capella (0.00s)
    --- PASS: TestUnsignedDataClone/aggregated_attestation (0.00s)
    --- PASS: TestUnsignedDataClone/sync_contribution (0.00s)
PASS
coverage: 45.4% of statements
ok      github.com/obolnetwork/charon/core  1.003s  coverage: 45.4% of statements
=== RUN   TestDutyExpiration
--- PASS: TestDutyExpiration (0.00s)
=== RUN   TestCancelledQuery
--- PASS: TestCancelledQuery (0.00s)
=== RUN   TestDutyExpirationV2
--- PASS: TestDutyExpirationV2 (0.00s)
=== RUN   TestCancelledQueryV2
--- PASS: TestCancelledQueryV2 (0.00s)
=== RUN   Test_MemDB
=== RUN   Test_MemDB/MemDB
=== RUN   Test_MemDB/MemDB/write_read
=== RUN   Test_MemDB/MemDB/write_unblocks
=== RUN   Test_MemDB/MemDB/cancel_await
=== RUN   Test_MemDB/MemDB/cancelled_await
=== RUN   Test_MemDB/MemDB/cancel_await_does_not_block
=== RUN   Test_MemDB/MemDB/cannot_overwrite
=== RUN   Test_MemDB/MemDB/write_idempotent
=== RUN   Test_MemDB/MemDB/write_read_after_stopped
=== RUN   Test_MemDB/MemDBV2
=== RUN   Test_MemDB/MemDBV2/write_read
=== RUN   Test_MemDB/MemDBV2/write_unblocks
=== RUN   Test_MemDB/MemDBV2/cancel_await
=== RUN   Test_MemDB/MemDBV2/cancelled_await
=== RUN   Test_MemDB/MemDBV2/cancel_await_does_not_block
=== RUN   Test_MemDB/MemDBV2/cannot_overwrite
=== RUN   Test_MemDB/MemDBV2/write_idempotent
=== RUN   Test_MemDB/MemDBV2/write_read_after_stopped
--- PASS: Test_MemDB (0.10s)
    --- PASS: Test_MemDB/MemDB (0.05s)
        --- PASS: Test_MemDB/MemDB/write_read (0.00s)
        --- PASS: Test_MemDB/MemDB/write_unblocks (0.00s)
        --- PASS: Test_MemDB/MemDB/cancel_await (0.00s)
        --- PASS: Test_MemDB/MemDB/cancelled_await (0.00s)
        --- PASS: Test_MemDB/MemDB/cancel_await_does_not_block (0.00s)
        --- PASS: Test_MemDB/MemDB/cannot_overwrite (0.00s)
        --- PASS: Test_MemDB/MemDB/write_idempotent (0.00s)
        --- PASS: Test_MemDB/MemDB/write_read_after_stopped (0.05s)
    --- PASS: Test_MemDB/MemDBV2 (0.05s)
        --- PASS: Test_MemDB/MemDBV2/write_read (0.00s)
        --- PASS: Test_MemDB/MemDBV2/write_unblocks (0.00s)
        --- PASS: Test_MemDB/MemDBV2/cancel_await (0.00s)
        --- PASS: Test_MemDB/MemDBV2/cancelled_await (0.00s)
        --- PASS: Test_MemDB/MemDBV2/cancel_await_does_not_block (0.00s)
        --- PASS: Test_MemDB/MemDBV2/cannot_overwrite (0.00s)
        --- PASS: Test_MemDB/MemDBV2/write_idempotent (0.00s)
        --- PASS: Test_MemDB/MemDBV2/write_read_after_stopped (0.05s)
PASS
coverage: 24.6% of statements
ok      github.com/obolnetwork/charon/core/aggsigdb 0.779s  coverage: 24.6% of statements
=== RUN   TestBroadcast
=== RUN   TestBroadcast/Broadcast_Attestation
14:18:49.927 [34mINFO [0m [32mbcast     [0m Successfully submitted attestations to beacon node {"delay":
"18013h18m49.927221s"}
14:18:49.927 [34mINFO [0m [32mbcast     [0m Successfully submitted attestations to beacon node {"delay":
"18013h18m49.927544s"}
=== RUN   TestBroadcast/Broadcast_Beacon_Block_Proposal
```

```
14:18:49.942 [34mINFO [0m [32mbcast     [0m Successfully submitted block proposal to beacon node
{"delay": "18013h18m49.942846s", "pubkey": "a02_9d4"}
=== RUN   TestBroadcast/Broadcast_Blinded_Beacon_Block_Proposal
14:18:49.952 [34mINFO [0m [32mbcast     [0m Successfully submitted blinded block proposal to beacon node
{"delay": "18013h18m49.952005s", "pubkey": "566_f5c"}
=== RUN   TestBroadcast/Broadcast_Validator_Registration
14:18:49.957 [34mINFO [0m [32mbcast     [0m Successfully submitted validator registrations to beacon
node {"delay": "2m1.957023s"}
=== RUN   TestBroadcast/Broadcast_Validator_Exit
14:18:49.961 [34mINFO [0m [32mbcast     [0m Successfully submitted voluntary exit to beacon node
{"delay": "18013h18m49.961528s", "pubkey": "c1b_3db"}
=== RUN   TestBroadcast/Broadcast_Aggregate_Attestation
14:18:49.963 [34mINFO [0m [32mbcast     [0m Successfully submitted attestation aggregations to beacon
node {"delay": "18013h18m49.963213s"}
=== RUN   TestBroadcast/Broadcast_Beacon_Committee_Selections
=== RUN   TestBroadcast/Broadcast_Sync_Committee_Message
14:18:49.968 [34mINFO [0m [32mbcast     [0m Successfully submitted sync committee messages to beacon
node {"delay": "18013h18m49.968086s"}
=== RUN   TestBroadcast/Broadcast_Sync_Committee_Contribution
14:18:49.972 [34mINFO [0m [32mbcast     [0m Successfully submitted sync committee contributions to
beacon node {"delay": "18013h18m49.972063s"}
--- PASS: TestBroadcast (0.07s)
    --- PASS: TestBroadcast/Broadcast_Attestation (0.00s)
    --- PASS: TestBroadcast/Broadcast_Beacon_Block_Proposal (0.00s)
    --- PASS: TestBroadcast/Broadcast_Blinded_Beacon_Block_Proposal (0.00s)
    --- PASS: TestBroadcast/Broadcast_Validator_Registration (0.00s)
    --- PASS: TestBroadcast/Broadcast_Validator_Exit (0.00s)
    --- PASS: TestBroadcast/Broadcast_Aggregate_Attestation (0.00s)
    --- PASS: TestBroadcast/Broadcast_Beacon_Committee_Selections (0.00s)
    --- PASS: TestBroadcast/Broadcast_Sync_Committee_Message (0.00s)
    --- PASS: TestBroadcast/Broadcast_Sync_Committee_Contribution (0.00s)
PASS
coverage: 22.2% of statements
ok      github.com/obolnetwork/charon/core/bcast    1.327s  coverage: 22.2% of statements
=== RUN   TestDebugRoundChange
=== RUN   TestDebugRoundChange/empty-1
=== RUN   TestDebugRoundChange/empty-2
=== RUN   TestDebugRoundChange/quorum
--- PASS: TestDebugRoundChange (0.00s)
    --- PASS: TestDebugRoundChange/empty-1 (0.00s)
    --- PASS: TestDebugRoundChange/empty-2 (0.00s)
    --- PASS: TestDebugRoundChange/quorum (0.00s)
=== RUN   TestComponent_handle
=== RUN   TestComponent_handle/qbft_message_with_no_pubkey_errors
=== RUN   TestComponent_handle/qbft_message_with_justifications_mentioning_unknown_peerIdx_errors
=== RUN   TestComponent_handle/qbft_message_with_nil_justification_present_in_slice
=== RUN   TestComponent_handle/qbft_message_values_present_but_nil
=== RUN   TestComponent_handle/qbft_message_with_invalid_duty_fails
=== RUN
TestComponent_handle/qbft_message_with_valid_duty_fails_because_justification_has_different_duty_type
=== RUN
TestComponent_handle/qbft_message_with_valid_duty_and_justification_with_same_duty_does_not_fail
--- PASS: TestComponent_handle (0.02s)
    --- PASS: TestComponent_handle/qbft_message_with_no_pubkey_errors (0.00s)
    --- PASS: TestComponent_handle/qbft_message_with_justifications_mentioning_unknown_peerIdx_errors
(0.01s)
    --- PASS: TestComponent_handle/qbft_message_with_nil_justification_present_in_slice (0.00s)
    --- PASS: TestComponent_handle/qbft_message_values_present_but_nil (0.00s)
    --- PASS: TestComponent_handle/qbft_message_with_invalid_duty_fails (0.00s)
    --- PASS:
TestComponent_handle/qbft_message_with_valid_duty_fails_because_justification_has_different_duty_type
(0.00s)
    --- PASS:
TestComponent_handle/qbft_message_with_valid_duty_and_justification_with_same_duty_does_not_fail (0.00s)
=== RUN   TestComponentHandle
=== RUN   TestComponentHandle/invalid_message
=== RUN   TestComponentHandle/nil_msg
=== RUN   TestComponentHandle/nil_msg_duty
=== RUN   TestComponentHandle/invalid_consensus_msg_type
=== RUN   TestComponentHandle/invalid_msg_duty_type
=== RUN   TestComponentHandle/invalid_peer_index
--- PASS: TestComponentHandle (0.00s)
```

```
    --- PASS: TestComponentHandle/invalid_message (0.00s)
    --- PASS: TestComponentHandle/nil_msg (0.00s)
    --- PASS: TestComponentHandle/nil_msg_duty (0.00s)
    --- PASS: TestComponentHandle/invalid_consensus_msg_type (0.00s)
    --- PASS: TestComponentHandle/invalid_msg_duty_type (0.00s)
    --- PASS: TestComponentHandle/invalid_peer_index (0.00s)
=== RUN   TestInstanceIO_MaybeStart
=== RUN   TestInstanceIO_MaybeStart/MaybeStart_for_new_instance
=== RUN   TestInstanceIO_MaybeStart/MaybeStart_after_handle
=== RUN   TestInstanceIO_MaybeStart/Call_Propose_after_handle
14:18:50.196 [35mDEBG[0m [32mqbft      [0m QBFT consensus instance starting         {"peers": "[]",
"timer": "inc", "duty": "42/proposer"}
--- PASS: TestInstanceIO_MaybeStart (0.00s)
    --- PASS: TestInstanceIO_MaybeStart/MaybeStart_for_new_instance (0.00s)
    --- PASS: TestInstanceIO_MaybeStart/MaybeStart_after_handle (0.00s)
    --- PASS: TestInstanceIO_MaybeStart/Call_Propose_after_handle (0.00s)
=== RUN   TestHashProto
--- PASS: TestHashProto (0.00s)
=== RUN   TestSigning
--- PASS: TestSigning (0.00s)
=== RUN   TestNewMsg
--- PASS: TestNewMsg (0.00s)
=== RUN   TestPartialLegacyNewMsg
--- PASS: TestPartialLegacyNewMsg (0.00s)
=== RUN   TestIncreasingRoundTimer
=== RUN   TestIncreasingRoundTimer/round_1
=== RUN   TestIncreasingRoundTimer/round_2
=== RUN   TestIncreasingRoundTimer/round_10
--- PASS: TestIncreasingRoundTimer (0.00s)
    --- PASS: TestIncreasingRoundTimer/round_1 (0.00s)
    --- PASS: TestIncreasingRoundTimer/round_2 (0.00s)
    --- PASS: TestIncreasingRoundTimer/round_10 (0.00s)
=== RUN   TestDoubleEagerLinearRoundTimer
--- PASS: TestDoubleEagerLinearRoundTimer (0.00s)
=== RUN   TestGetTimerFunc
--- PASS: TestGetTimerFunc (0.00s)
=== RUN   TestSniffedFile
    sniffed_internal_test.go:31: no sniffed file provided
--- SKIP: TestSniffedFile (0.00s)
=== RUN   TestSimulatorOnce
--- PASS: TestSimulatorOnce (0.01s)
=== RUN   TestMatrix
    strategysim_internal_test.go:77: Skip matrix test
--- SKIP: TestMatrix (0.00s)
=== RUN   TestExp
--- PASS: TestExp (0.00s)
=== RUN   TestComponent
=== RUN   TestComponent/2-of-3
=== RUN   TestComponent/3-of-4
=== RUN   TestComponent/4-of-4
=== RUN   TestComponent/4-of-6
--- PASS: TestComponent (0.17s)
    --- PASS: TestComponent/2-of-3 (0.05s)
    --- PASS: TestComponent/3-of-4 (0.03s)
    --- PASS: TestComponent/4-of-4 (0.04s)
    --- PASS: TestComponent/4-of-6 (0.05s)
PASS
coverage: 42.4% of statements
ok      github.com/obolnetwork/charon/core/consensus    1.336s  coverage: 42.4% of statements
=== RUN   TestCancelledQueries
--- PASS: TestCancelledQueries (0.00s)
=== RUN   TestShutdown
--- PASS: TestShutdown (0.00s)
=== RUN   TestMemDB
--- PASS: TestMemDB (0.00s)
=== RUN   TestMemDBProposer
--- PASS: TestMemDBProposer (0.00s)
=== RUN   TestMemDBAggregator
--- PASS: TestMemDBAggregator (0.00s)
=== RUN   TestMemDBSyncContribution
=== RUN   TestMemDBSyncContribution/await_sync_contribution
=== RUN   TestMemDBSyncContribution/dutydb_shutdown
```

```
=== RUN   TestMemDBSyncContribution/clashing_sync_contributions
=== RUN   TestMemDBSyncContribution/invalid_unsigned_sync_contribution
--- PASS: TestMemDBSyncContribution (0.00s)
    --- PASS: TestMemDBSyncContribution/await_sync_contribution (0.00s)
    --- PASS: TestMemDBSyncContribution/dutydb_shutdown (0.00s)
    --- PASS: TestMemDBSyncContribution/clashing_sync_contributions (0.00s)
    --- PASS: TestMemDBSyncContribution/invalid_unsigned_sync_contribution (0.00s)
=== RUN   TestMemDBClashingBlocks
--- PASS: TestMemDBClashingBlocks (0.00s)
=== RUN   TestMemDBClashProposer
--- PASS: TestMemDBClashProposer (0.00s)
=== RUN   TestMemDBBuilderProposer
--- PASS: TestMemDBBuilderProposer (0.00s)
=== RUN   TestMemDBClashingBlindedBlocks
--- PASS: TestMemDBClashingBlindedBlocks (0.00s)
=== RUN   TestMemDBClashBuilderProposer
--- PASS: TestMemDBClashBuilderProposer (0.00s)
=== RUN   TestDutyExpiry
--- PASS: TestDutyExpiry (0.00s)
PASS
coverage: 33.1% of statements
ok      github.com/obolnetwork/charon/core/dutydb   1.251s  coverage: 33.1% of statements
=== RUN   TestFetchAttester
--- PASS: TestFetchAttester (0.02s)
=== RUN   TestFetchAggregator
=== RUN   TestFetchAggregator/aggregator_with_different_committee_index
14:18:50.603 [34mINFO [0m [32m          [0m Resolved attester aggregation duty       {"pubkey":
"de7_c98"}
14:18:50.603 [34mINFO [0m [32m          [0m Resolved attester aggregation duty       {"pubkey":
"9a9_d9f"}
=== RUN   TestFetchAggregator/aggregator_with_same_committee_index
14:18:50.604 [34mINFO [0m [32m          [0m Resolved attester aggregation duty       {"pubkey":
"de7_c98"}
14:18:50.604 [34mINFO [0m [32m          [0m Resolved attester aggregation duty       {"pubkey":
"9a9_d9f"}
=== RUN   TestFetchAggregator/no_aggregator
14:18:50.605 [35mDEBG [0m [32m          [0m Attester not selected for aggregation duty {"pubkey":
"de7_c98"}
14:18:50.605 [35mDEBG [0m [32m          [0m Attester not selected for aggregation duty {"pubkey":
"9a9_d9f"}
=== RUN   TestFetchAggregator/nil_aggregate_attestation_response
14:18:50.605 [34mINFO [0m [32m          [0m Resolved attester aggregation duty       {"pubkey":
"9a9_d9f"}
--- PASS: TestFetchAggregator (0.03s)
    --- PASS: TestFetchAggregator/aggregator_with_different_committee_index (0.00s)
    --- PASS: TestFetchAggregator/aggregator_with_same_committee_index (0.00s)
    --- PASS: TestFetchAggregator/no_aggregator (0.00s)
    --- PASS: TestFetchAggregator/nil_aggregate_attestation_response (0.00s)
=== RUN   TestFetchBlocks
=== RUN   TestFetchBlocks/fetch_DutyProposer
=== RUN   TestFetchBlocks/fetch_DutyBuilderProposer
--- PASS: TestFetchBlocks (0.01s)
    --- PASS: TestFetchBlocks/fetch_DutyProposer (0.00s)
    --- PASS: TestFetchBlocks/fetch_DutyBuilderProposer (0.00s)
=== RUN   TestFetchSyncContribution
=== RUN   TestFetchSyncContribution/contribution_aggregator
14:18:50.626 [34mINFO [0m [32m          [0m Resolved sync committee contribution duty {"pubkey":
"f06_357"}
14:18:50.626 [34mINFO [0m [32m          [0m Resolved sync committee contribution duty {"pubkey":
"bc5_7fb"}
=== RUN   TestFetchSyncContribution/not_contribution_aggregator
14:18:50.634 [35mDEBG [0m [32m          [0m Sync committee member not selected for contribution
aggregation duty {"pubkey": "f06_357"}
14:18:50.634 [35mDEBG [0m [32m          [0m Sync committee member not selected for contribution
aggregation duty {"pubkey": "bc5_7fb"}
=== RUN   TestFetchSyncContribution/fetch_contribution_data_error
--- PASS: TestFetchSyncContribution (0.03s)
    --- PASS: TestFetchSyncContribution/contribution_aggregator (0.01s)
    --- PASS: TestFetchSyncContribution/not_contribution_aggregator (0.01s)
    --- PASS: TestFetchSyncContribution/fetch_contribution_data_error (0.01s)
PASS
coverage: 26.2% of statements
```

```
ok      github.com/obolnetwork/charon/core/fetcher  0.345s  coverage: 26.2% of statements
=== RUN   TestGetThresholdMatching
=== RUN   TestGetThresholdMatching/empty
=== RUN   TestGetThresholdMatching/empty/SyncCommitteeMessage
=== RUN   TestGetThresholdMatching/empty/Selection
=== RUN   TestGetThresholdMatching/all_identical_exact_threshold
=== RUN   TestGetThresholdMatching/all_identical_exact_threshold/SyncCommitteeMessage
=== RUN   TestGetThresholdMatching/all_identical_exact_threshold/Selection
=== RUN   TestGetThresholdMatching/all_identical_above_threshold
=== RUN   TestGetThresholdMatching/all_identical_above_threshold/SyncCommitteeMessage
=== RUN   TestGetThresholdMatching/all_identical_above_threshold/Selection
=== RUN   TestGetThresholdMatching/one_odd
=== RUN   TestGetThresholdMatching/one_odd/SyncCommitteeMessage
=== RUN   TestGetThresholdMatching/one_odd/Selection
=== RUN   TestGetThresholdMatching/two_odd
=== RUN   TestGetThresholdMatching/two_odd/SyncCommitteeMessage
=== RUN   TestGetThresholdMatching/two_odd/Selection
--- PASS: TestGetThresholdMatching (0.00s)
    --- PASS: TestGetThresholdMatching/empty (0.00s)
        --- PASS: TestGetThresholdMatching/empty/SyncCommitteeMessage (0.00s)
        --- PASS: TestGetThresholdMatching/empty/Selection (0.00s)
    --- PASS: TestGetThresholdMatching/all_identical_exact_threshold (0.00s)
        --- PASS: TestGetThresholdMatching/all_identical_exact_threshold/SyncCommitteeMessage (0.00s)
        --- PASS: TestGetThresholdMatching/all_identical_exact_threshold/Selection (0.00s)
    --- PASS: TestGetThresholdMatching/all_identical_above_threshold (0.00s)
        --- PASS: TestGetThresholdMatching/all_identical_above_threshold/SyncCommitteeMessage (0.00s)
        --- PASS: TestGetThresholdMatching/all_identical_above_threshold/Selection (0.00s)
    --- PASS: TestGetThresholdMatching/one_odd (0.00s)
        --- PASS: TestGetThresholdMatching/one_odd/SyncCommitteeMessage (0.00s)
        --- PASS: TestGetThresholdMatching/one_odd/Selection (0.00s)
    --- PASS: TestGetThresholdMatching/two_odd (0.00s)
        --- PASS: TestGetThresholdMatching/two_odd/SyncCommitteeMessage (0.00s)
        --- PASS: TestGetThresholdMatching/two_odd/Selection (0.00s)
=== RUN   TestMemDBThreshold
--- PASS: TestMemDBThreshold (0.00s)
PASS
coverage: 16.3% of statements
ok      github.com/obolnetwork/charon/core/parsigdb 0.207s  coverage: 16.3% of statements
=== RUN   TestMemEx
--- PASS: TestMemEx (0.00s)
=== RUN   TestParSigEx
--- PASS: TestParSigEx (0.05s)
=== RUN   TestParSigExVerifier
=== RUN   TestParSigExVerifier/Verify_attestation
=== RUN   TestParSigExVerifier/Verify_proposal
=== RUN   TestParSigExVerifier/Verify_blinded_proposal
=== RUN   TestParSigExVerifier/Verify_Randao
=== RUN   TestParSigExVerifier/Verify_Voluntary_Exit
=== RUN   TestParSigExVerifier/Verify_validator_registration
=== RUN   TestParSigExVerifier/Verify_beacon_committee_selection
=== RUN   TestParSigExVerifier/Verify_aggregate_and_proof
=== RUN   TestParSigExVerifier/verify_sync_committee_message
=== RUN   TestParSigExVerifier/verify_sync_committee_selection
=== RUN   TestParSigExVerifier/verify_sync_committee_contribution_and_proof
--- PASS: TestParSigExVerifier (0.03s)
    --- PASS: TestParSigExVerifier/Verify_attestation (0.00s)
    --- PASS: TestParSigExVerifier/Verify_proposal (0.00s)
    --- PASS: TestParSigExVerifier/Verify_blinded_proposal (0.00s)
    --- PASS: TestParSigExVerifier/Verify_Randao (0.00s)
    --- PASS: TestParSigExVerifier/Verify_Voluntary_Exit (0.00s)
    --- PASS: TestParSigExVerifier/Verify_validator_registration (0.00s)
    --- PASS: TestParSigExVerifier/Verify_beacon_committee_selection (0.00s)
    --- PASS: TestParSigExVerifier/Verify_aggregate_and_proof (0.00s)
    --- PASS: TestParSigExVerifier/verify_sync_committee_message (0.00s)
    --- PASS: TestParSigExVerifier/verify_sync_committee_selection (0.00s)
    --- PASS: TestParSigExVerifier/verify_sync_committee_contribution_and_proof (0.00s)
PASS
coverage: 23.2% of statements
ok      github.com/obolnetwork/charon/core/parsigex 0.491s  coverage: 23.2% of statements
=== RUN   TestCalculateResults
=== RUN   TestCalculateResults/1*v1
=== RUN   TestCalculateResults/Q-1*v1
```

```
=== RUN   TestCalculateResults/Q*v1
=== RUN   TestCalculateResults/N*v1
=== RUN   TestCalculateResults/N-1*v1,1*v2
=== RUN   TestCalculateResults/N-Q*v1,Q*v2
=== RUN   TestCalculateResults/N*v2
=== RUN   TestCalculateResults/N-1*v2,1*down
=== RUN   TestCalculateResults/Q-1*v2,3*down
=== RUN   TestCalculateResults/1*v1,N-1*v2
=== RUN   TestCalculateResults/1*v1,N-2*v2,1*down
=== RUN   TestCalculateResults/1*v1,Q-1*v2,2*down
=== RUN   TestCalculateResults/1*v1,N-2*v2,1*v3
=== RUN   TestCalculateResults/2*v1,N-3*v2,1*v3
=== RUN   TestCalculateResults/1*v1,1*v2,Q*v3
=== RUN   TestCalculateResults/2*v1,Q*v3
=== RUN   TestCalculateResults/deterministic_ordering_instance_1
=== RUN   TestCalculateResults/deterministic_ordering_instance_9
--- PASS: TestCalculateResults (0.00s)
    --- PASS: TestCalculateResults/1*v1 (0.00s)
    --- PASS: TestCalculateResults/Q-1*v1 (0.00s)
    --- PASS: TestCalculateResults/Q*v1 (0.00s)
    --- PASS: TestCalculateResults/N*v1 (0.00s)
    --- PASS: TestCalculateResults/N-1*v1,1*v2 (0.00s)
    --- PASS: TestCalculateResults/N-Q*v1,Q*v2 (0.00s)
    --- PASS: TestCalculateResults/N*v2 (0.00s)
    --- PASS: TestCalculateResults/N-1*v2,1*down (0.00s)
    --- PASS: TestCalculateResults/Q-1*v2,3*down (0.00s)
    --- PASS: TestCalculateResults/1*v1,N-1*v2 (0.00s)
    --- PASS: TestCalculateResults/1*v1,N-2*v2,1*down (0.00s)
    --- PASS: TestCalculateResults/1*v1,Q-1*v2,2*down (0.00s)
    --- PASS: TestCalculateResults/1*v1,N-2*v2,1*v3 (0.00s)
    --- PASS: TestCalculateResults/2*v1,N-3*v2,1*v3 (0.00s)
    --- PASS: TestCalculateResults/1*v1,1*v2,Q*v3 (0.00s)
    --- PASS: TestCalculateResults/2*v1,Q*v3 (0.00s)
    --- PASS: TestCalculateResults/deterministic_ordering_instance_1 (0.00s)
    --- PASS: TestCalculateResults/deterministic_ordering_instance_9 (0.00s)
=== RUN   TestPrioritiser
--- PASS: TestPrioritiser (0.03s)
PASS
coverage: 30.0% of statements
ok      github.com/obolnetwork/charon/core/priority 0.621s  coverage: 30.0% of statements
=== RUN   TestQBFT
=== RUN   TestQBFT/happy_0
    qbft_internal_test.go:352: 00:00.004 1 => pre_prepare@1
    qbft_internal_test.go:321: 00:00.006 1 => pre_prepare@1 -> 1@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.006 1 => prepare@1
    qbft_internal_test.go:321: 00:00.008 1 => pre_prepare@1 -> 2@1 ~= justified_pre_prepare
    qbft_internal_test.go:321: 00:00.008 1 => pre_prepare@1 -> 3@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.008 3 => prepare@1
    qbft_internal_test.go:352: 00:00.008 2 => prepare@1
    qbft_internal_test.go:321: 00:00.010 2 => prepare@1 -> 2@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.010 2 => commit@1
    qbft_internal_test.go:321: 00:00.011 2 => prepare@1 -> 1@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.012 1 => commit@1
    qbft_internal_test.go:321: 00:00.011 2 => prepare@1 -> 3@1 ~= quorum_prepares
    qbft_internal_test.go:321: 00:00.013 1 => pre_prepare@1 -> 4@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.014 4 => prepare@1
    qbft_internal_test.go:352: 00:00.013 3 => commit@1
    qbft_internal_test.go:321: 00:00.016 3 => commit@1 -> 2@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.017 3 => commit@1 -> 1@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.017 2 => prepare@1 -> 4@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.018 4 => commit@1
    qbft_internal_test.go:321: 00:00.017 3 => commit@1 -> 3@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.020 3 => commit@1 -> 4@1 ~= quorum_commits
    qbft_internal_test.go:21: Got all results in round 1 after 21ms: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:0, peerIdx:1, round:1, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
2:qbft.msg{msgType:3, instance:0, peerIdx:2, round:1, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:0, peerIdx:3, round:1, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/happy_1
    qbft_internal_test.go:352: 00:00.004 2 => pre_prepare@1
    qbft_internal_test.go:321: 00:00.005 2 => pre_prepare@1 -> 4@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.005 4 => prepare@1
    qbft_internal_test.go:321: 00:00.007 2 => pre_prepare@1 -> 2@1 ~= justified_pre_prepare
```

```
    qbft_internal_test.go:352: 00:00.007 2 => prepare@1
    qbft_internal_test.go:321: 00:00.008 2 => pre_prepare@1 -> 1@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.008 1 => prepare@1
    qbft_internal_test.go:321: 00:00.009 1 => prepare@1 -> 4@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.009 4 => commit@1
    qbft_internal_test.go:321: 00:00.011 2 => pre_prepare@1 -> 3@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.011 3 => prepare@1
    qbft_internal_test.go:321: 00:00.013 1 => prepare@1 -> 2@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.013 2 => commit@1
    qbft_internal_test.go:321: 00:00.014 1 => prepare@1 -> 1@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.014 1 => commit@1
    qbft_internal_test.go:321: 00:00.015 1 => commit@1 -> 4@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.016 1 => prepare@1 -> 3@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.016 3 => commit@1
    qbft_internal_test.go:321: 00:00.017 1 => commit@1 -> 2@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.018 1 => commit@1 -> 1@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.019 1 => commit@1 -> 3@1 ~= quorum_commits
    qbft_internal_test.go:29: Got all results in round 1 after 20ms: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:1, peerIdx:1, round:1, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
2:qbft.msg{msgType:3, instance:1, peerIdx:2, round:1, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:1, peerIdx:4, round:1, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/prepare_round_1,_decide_round_2
    qbft_internal_test.go:352: 00:00.004 1 => pre_prepare@1
    qbft_internal_test.go:321: 00:00.005 1 => pre_prepare@1 -> 4@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.005 4 => prepare@1
    qbft_internal_test.go:321: 00:00.007 1 => pre_prepare@1 -> 3@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.007 3 => prepare@1
    qbft_internal_test.go:321: 00:00.008 1 => pre_prepare@1 -> 1@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.008 1 => prepare@1
    qbft_internal_test.go:321: 00:00.009 1 => prepare@1 -> 4@1 ~= quorum_prepares
    qbft_internal_test.go:348: 00:00.009 4 dropping early commit for round 1
    qbft_internal_test.go:321: 00:00.010 1 => pre_prepare@1 -> 2@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.010 2 => prepare@1
    qbft_internal_test.go:321: 00:00.012 1 => prepare@1 -> 3@1 ~= quorum_prepares
    qbft_internal_test.go:348: 00:00.012 3 dropping early commit for round 1
    qbft_internal_test.go:321: 00:00.013 1 => prepare@1 -> 1@1 ~= quorum_prepares
    qbft_internal_test.go:348: 00:00.013 1 dropping early commit for round 1
    qbft_internal_test.go:321: 00:00.014 1 => prepare@1 -> 2@1 ~= quorum_prepares
    qbft_internal_test.go:348: 00:00.014 2 dropping early commit for round 1
    qbft_internal_test.go:318: 00:01.006 4@1 change to 2 ~= round_timeout
    qbft_internal_test.go:318: 00:01.007 3@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.010 4 => round_change@2
    qbft_internal_test.go:352: 00:01.010 3 => round_change@2
    qbft_internal_test.go:318: 00:01.008 1@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.011 1 => round_change@2
    qbft_internal_test.go:318: 00:01.010 2@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.011 2 => round_change@2
    qbft_internal_test.go:321: 00:01.012 3 => round_change@2 -> 2@2 ~= quorum_round_changes
    qbft_internal_test.go:352: 00:01.012 2 => pre_prepare@2
    qbft_internal_test.go:321: 00:01.014 2 => pre_prepare@2 -> 1@2 ~= justified_pre_prepare
    qbft_internal_test.go:321: 00:01.016 2 => pre_prepare@2 -> 4@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.017 4 => prepare@2
    qbft_internal_test.go:352: 00:01.016 1 => prepare@2
    qbft_internal_test.go:321: 00:01.015 2 => pre_prepare@2 -> 3@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.017 3 => prepare@2
    qbft_internal_test.go:321: 00:01.014 2 => pre_prepare@2 -> 2@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.018 2 => prepare@2
    qbft_internal_test.go:321: 00:01.019 3 => prepare@2 -> 4@2 ~= quorum_prepares
    qbft_internal_test.go:321: 00:01.019 2 => prepare@2 -> 2@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:01.021 2 => commit@2
    qbft_internal_test.go:352: 00:01.019 4 => commit@2
    qbft_internal_test.go:321: 00:01.019 3 => prepare@2 -> 1@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:01.021 1 => commit@2
    qbft_internal_test.go:321: 00:01.019 3 => prepare@2 -> 3@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:01.022 3 => commit@2
    qbft_internal_test.go:321: 00:01.023 1 => commit@2 -> 2@2 ~= quorum_commits
    qbft_internal_test.go:321: 00:01.024 1 => commit@2 -> 4@2 ~= quorum_commits
    qbft_internal_test.go:321: 00:01.024 4 => commit@2 -> 1@2 ~= quorum_commits
    qbft_internal_test.go:321: 00:01.027 1 => commit@2 -> 3@2 ~= quorum_commits
    qbft_internal_test.go:37: Got all results in round 2 after 1.03s: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:0, peerIdx:1, round:2, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
2:qbft.msg{msgType:3, instance:0, peerIdx:2, round:2, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
```

```
4:qbft.msg{msgType:3, instance:0, peerIdx:4, round:2, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/prepare_round_2,_decide_round_3
    qbft_internal_test.go:318: 00:01.000 4@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.004 4 => round_change@2
    qbft_internal_test.go:318: 00:01.002 2@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.005 2 => round_change@2
    qbft_internal_test.go:318: 00:01.003 3@1 change to 2 ~= round_timeout
    qbft_internal_test.go:318: 00:01.005 1@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.005 1 => round_change@2
    qbft_internal_test.go:352: 00:01.005 3 => round_change@2
    qbft_internal_test.go:321: 00:01.009 1 => round_change@2 -> 2@2 ~= quorum_round_changes
    qbft_internal_test.go:352: 00:01.009 2 => pre_prepare@2
    qbft_internal_test.go:321: 00:01.012 2 => pre_prepare@2 -> 4@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.013 4 => prepare@2
    qbft_internal_test.go:321: 00:01.012 2 => pre_prepare@2 -> 3@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.014 3 => prepare@2
    qbft_internal_test.go:321: 00:01.012 2 => pre_prepare@2 -> 2@2 ~= justified_pre_prepare
    qbft_internal_test.go:321: 00:01.016 2 => pre_prepare@2 -> 1@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.016 1 => prepare@2
    qbft_internal_test.go:352: 00:01.016 2 => prepare@2
    qbft_internal_test.go:321: 00:01.018 1 => prepare@2 -> 3@2 ~= quorum_prepares
    qbft_internal_test.go:348: 00:01.018 3 dropping early commit for round 2
    qbft_internal_test.go:321: 00:01.018 3 => prepare@2 -> 2@2 ~= quorum_prepares
    qbft_internal_test.go:348: 00:01.018 2 dropping early commit for round 2
    qbft_internal_test.go:321: 00:01.018 1 => prepare@2 -> 4@2 ~= quorum_prepares
    qbft_internal_test.go:348: 00:01.018 4 dropping early commit for round 2
    qbft_internal_test.go:321: 00:01.018 3 => prepare@2 -> 1@2 ~= quorum_prepares
    qbft_internal_test.go:348: 00:01.018 1 dropping early commit for round 2
    qbft_internal_test.go:318: 00:02.014 3@2 change to 3 ~= round_timeout
    qbft_internal_test.go:352: 00:02.018 3 => round_change@3
    qbft_internal_test.go:318: 00:02.019 1@2 change to 3 ~= round_timeout
    qbft_internal_test.go:352: 00:02.020 1 => round_change@3
    qbft_internal_test.go:318: 00:02.014 4@2 change to 3 ~= round_timeout
    qbft_internal_test.go:352: 00:02.021 4 => round_change@3
    qbft_internal_test.go:318: 00:02.016 2@2 change to 3 ~= round_timeout
    qbft_internal_test.go:352: 00:02.022 2 => round_change@3
    qbft_internal_test.go:321: 00:02.023 4 => round_change@3 -> 3@3 ~= quorum_round_changes
    qbft_internal_test.go:352: 00:02.023 3 => pre_prepare@3
    qbft_internal_test.go:321: 00:02.025 3 => pre_prepare@3 -> 2@3 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:02.027 2 => prepare@3
    qbft_internal_test.go:321: 00:02.025 3 => pre_prepare@3 -> 3@3 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:02.028 3 => prepare@3
    qbft_internal_test.go:321: 00:02.026 3 => pre_prepare@3 -> 1@3 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:02.028 1 => prepare@3
    qbft_internal_test.go:321: 00:02.026 3 => pre_prepare@3 -> 4@3 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:02.030 4 => prepare@3
    qbft_internal_test.go:321: 00:02.030 1 => prepare@3 -> 2@3 ~= quorum_prepares
    qbft_internal_test.go:321: 00:02.031 1 => prepare@3 -> 3@3 ~= quorum_prepares
    qbft_internal_test.go:352: 00:02.032 3 => commit@3
    qbft_internal_test.go:352: 00:02.031 2 => commit@3
    qbft_internal_test.go:321: 00:02.031 1 => prepare@3 -> 1@3 ~= quorum_prepares
    qbft_internal_test.go:352: 00:02.033 1 => commit@3
    qbft_internal_test.go:321: 00:02.033 1 => prepare@3 -> 4@3 ~= quorum_prepares
    qbft_internal_test.go:352: 00:02.034 4 => commit@3
    qbft_internal_test.go:321: 00:02.035 4 => commit@3 -> 2@3 ~= quorum_commits
    qbft_internal_test.go:321: 00:02.036 4 => commit@3 -> 3@3 ~= quorum_commits
    qbft_internal_test.go:321: 00:02.036 2 => commit@3 -> 1@3 ~= quorum_commits
    qbft_internal_test.go:321: 00:02.036 4 => commit@3 -> 4@3 ~= quorum_commits
    qbft_internal_test.go:46: Got all results in round 3 after 2.038s: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:0, peerIdx:1, round:3, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
2:qbft.msg{msgType:3, instance:0, peerIdx:2, round:3, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:0, peerIdx:3, round:3, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:0, peerIdx:4, round:3, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/leader_late_exp
    qbft_internal_test.go:364: 00:00.000 Node 1 start delay 2s
    qbft_internal_test.go:318: 00:01.001 3@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.001 3 => round_change@2
    qbft_internal_test.go:318: 00:01.001 2@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.001 2 => round_change@2
    qbft_internal_test.go:318: 00:01.003 4@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.003 4 => round_change@2
    qbft_internal_test.go:321: 00:01.007 4 => round_change@2 -> 2@2 ~= quorum_round_changes
```

```
    qbft_internal_test.go:352: 00:01.008 2 => pre_prepare@2
    qbft_internal_test.go:321: 00:01.010 2 => pre_prepare@2 -> 3@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.013 3 => prepare@2
    qbft_internal_test.go:321: 00:01.011 2 => pre_prepare@2 -> 2@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.014 2 => prepare@2
    qbft_internal_test.go:321: 00:01.011 2 => pre_prepare@2 -> 4@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.014 4 => prepare@2
    qbft_internal_test.go:321: 00:01.016 4 => prepare@2 -> 2@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:01.016 2 => commit@2
    qbft_internal_test.go:321: 00:01.016 4 => prepare@2 -> 3@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:01.017 3 => commit@2
    qbft_internal_test.go:321: 00:01.018 4 => prepare@2 -> 4@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:01.019 4 => commit@2
    qbft_internal_test.go:321: 00:01.021 4 => commit@2 -> 3@2 ~= quorum_commits
    qbft_internal_test.go:321: 00:01.021 4 => commit@2 -> 2@2 ~= quorum_commits
    qbft_internal_test.go:321: 00:01.021 4 => commit@2 -> 4@2 ~= quorum_commits
    qbft_internal_test.go:367: 00:02.002 Node 1 starting 2s
    qbft_internal_test.go:352: 00:02.004 1 => pre_prepare@1
    qbft_internal_test.go:321: 00:02.005 1 => pre_prepare@1 -> 1@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:02.006 1 => prepare@1
    qbft_internal_test.go:318: 00:03.006 1@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:03.006 1 => round_change@2
    qbft_internal_test.go:352: 00:03.007 2 => decided@2
    qbft_internal_test.go:352: 00:03.007 3 => decided@2
    qbft_internal_test.go:352: 00:03.007 4 => decided@2
    qbft_internal_test.go:321: 00:03.008 3 => decided@2 -> 1@2 ~= justified_decided
    qbft_internal_test.go:59: Got all results in round 2 after 3.009s: map[int64]qbft.Msg[int64,int64]
{2:qbft.msg{msgType:3, instance:0, peerIdx:2, round:2, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:0, peerIdx:3, round:2, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:0, peerIdx:4, round:2, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/leader_down_const
    qbft_internal_test.go:364: 00:00.001 Node 1 start delay 2s
    qbft_internal_test.go:318: 00:01.001 4@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.001 4 => round_change@2
    qbft_internal_test.go:318: 00:01.001 3@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.001 3 => round_change@2
    qbft_internal_test.go:318: 00:01.003 2@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.004 2 => round_change@2
    qbft_internal_test.go:321: 00:01.007 2 => round_change@2 -> 2@2 ~= quorum_round_changes
    qbft_internal_test.go:352: 00:01.009 2 => pre_prepare@2
    qbft_internal_test.go:321: 00:01.010 2 => pre_prepare@2 -> 4@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.010 4 => prepare@2
    qbft_internal_test.go:321: 00:01.012 2 => pre_prepare@2 -> 2@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.013 2 => prepare@2
    qbft_internal_test.go:321: 00:01.015 2 => pre_prepare@2 -> 3@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.015 3 => prepare@2
    qbft_internal_test.go:321: 00:01.015 3 => prepare@2 -> 3@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:01.016 3 => commit@2
    qbft_internal_test.go:321: 00:01.016 3 => prepare@2 -> 2@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:01.017 2 => commit@2
    qbft_internal_test.go:321: 00:01.017 3 => prepare@2 -> 4@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:01.020 4 => commit@2
    qbft_internal_test.go:321: 00:01.022 4 => commit@2 -> 3@2 ~= quorum_commits
    qbft_internal_test.go:321: 00:01.022 4 => commit@2 -> 4@2 ~= quorum_commits
    qbft_internal_test.go:321: 00:01.023 4 => commit@2 -> 2@2 ~= quorum_commits
    qbft_internal_test.go:367: 00:02.001 Node 1 starting 2s
    qbft_internal_test.go:352: 00:02.008 1 => pre_prepare@1
    qbft_internal_test.go:321: 00:02.010 1 => pre_prepare@1 -> 1@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:02.011 1 => prepare@1
    qbft_internal_test.go:318: 00:03.011 1@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:03.014 1 => round_change@2
    qbft_internal_test.go:352: 00:03.017 2 => decided@2
    qbft_internal_test.go:352: 00:03.017 3 => decided@2
    qbft_internal_test.go:352: 00:03.017 4 => decided@2
    qbft_internal_test.go:321: 00:03.021 2 => decided@2 -> 1@2 ~= justified_decided
    qbft_internal_test.go:67: Got all results in round 2 after 3.023s: map[int64]qbft.Msg[int64,int64]
{2:qbft.msg{msgType:3, instance:0, peerIdx:2, round:2, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:0, peerIdx:3, round:2, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:0, peerIdx:4, round:2, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/very_late_exp
    qbft_internal_test.go:364: 00:00.000 Node 1 start delay 5s
    qbft_internal_test.go:364: 00:00.001 Node 2 start delay 10s
```

```
qbft_internal_test.go:318: 00:01.001 4@1 change to 2 ~= round_timeout
qbft_internal_test.go:318: 00:01.001 3@1 change to 2 ~= round_timeout
qbft_internal_test.go:352: 00:01.003 4 => round_change@2
qbft_internal_test.go:352: 00:01.004 3 => round_change@2
qbft_internal_test.go:318: 00:03.003 4@2 change to 3 ~= round_timeout
qbft_internal_test.go:318: 00:03.004 3@2 change to 3 ~= round_timeout
qbft_internal_test.go:352: 00:03.005 3 => round_change@3
qbft_internal_test.go:352: 00:03.005 4 => round_change@3
qbft_internal_test.go:367: 00:05.000 Node 1 starting 5s
qbft_internal_test.go:318: 00:06.000 1@1 change to 2 ~= round_timeout
qbft_internal_test.go:352: 00:06.000 1 => round_change@2
qbft_internal_test.go:318: 00:07.004 4@3 change to 4 ~= round_timeout
qbft_internal_test.go:352: 00:07.006 4 => round_change@4
qbft_internal_test.go:318: 00:07.005 3@3 change to 4 ~= round_timeout
qbft_internal_test.go:352: 00:07.007 3 => round_change@4
qbft_internal_test.go:321: 00:07.009 3 => round_change@4 -> 1@2 ~= f_plus_1_round_changes
qbft_internal_test.go:318: 00:07.010 1@2 change to 4 ~= f_plus_1_round_changes
qbft_internal_test.go:352: 00:07.010 1 => round_change@4
qbft_internal_test.go:321: 00:07.013 1 => round_change@4 -> 3@4 ~= quorum_round_changes
qbft_internal_test.go:352: 00:07.014 3 => pre_prepare@4
qbft_internal_test.go:321: 00:07.016 3 => pre_prepare@4 -> 3@4 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:07.016 3 => prepare@4
qbft_internal_test.go:321: 00:07.016 3 => pre_prepare@4 -> 4@4 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:07.018 4 => prepare@4
    qbft_internal_test.go:321: 00:07.017 3 => pre_prepare@4 -> 1@4 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:07.018 1 => prepare@4
    qbft_internal_test.go:321: 00:07.019 4 => prepare@4 -> 1@4 ~= quorum_prepares
    qbft_internal_test.go:321: 00:07.019 1 => prepare@4 -> 3@4 ~= quorum_prepares
    qbft_internal_test.go:352: 00:07.020 3 => commit@4
    qbft_internal_test.go:352: 00:07.019 1 => commit@4
    qbft_internal_test.go:321: 00:07.020 1 => prepare@4 -> 4@4 ~= quorum_prepares
    qbft_internal_test.go:352: 00:07.021 4 => commit@4
    qbft_internal_test.go:321: 00:07.023 4 => commit@4 -> 3@4 ~= quorum_commits
    qbft_internal_test.go:321: 00:07.024 4 => commit@4 -> 4@4 ~= quorum_commits
    qbft_internal_test.go:321: 00:07.024 4 => commit@4 -> 1@4 ~= quorum_commits
    qbft_internal_test.go:367: 00:10.001 Node 2 starting 10s
    qbft_internal_test.go:318: 00:11.002 2@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:11.002 2 => round_change@2
    qbft_internal_test.go:352: 00:11.003 4 => decided@4
    qbft_internal_test.go:321: 00:11.005 4 => decided@4 -> 2@2 ~= justified_decided
    qbft_internal_test.go:318: 00:11.006 2@2 change to 4 ~= justified_decided
    qbft_internal_test.go:352: 00:11.005 1 => decided@4
    qbft_internal_test.go:352: 00:11.005 3 => decided@4
    qbft_internal_test.go:76: Got all results in round 4 after 11.008s: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:3, peerIdx:1, round:4, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:3, peerIdx:3, round:4, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:3, peerIdx:4, round:4, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/very_late_const
qbft_internal_test.go:364: 00:00.001 Node 1 start delay 5s
qbft_internal_test.go:364: 00:00.002 Node 2 start delay 10s
qbft_internal_test.go:318: 00:01.000 4@1 change to 2 ~= round_timeout
qbft_internal_test.go:352: 00:01.000 4 => round_change@2
qbft_internal_test.go:318: 00:01.003 3@1 change to 2 ~= round_timeout
qbft_internal_test.go:352: 00:01.003 3 => round_change@2
qbft_internal_test.go:318: 00:02.000 4@2 change to 3 ~= round_timeout
qbft_internal_test.go:352: 00:02.003 4 => round_change@3
qbft_internal_test.go:318: 00:02.003 3@2 change to 3 ~= round_timeout
qbft_internal_test.go:352: 00:02.022 3 => round_change@3
qbft_internal_test.go:318: 00:03.003 4@3 change to 4 ~= round_timeout
qbft_internal_test.go:352: 00:03.006 4 => round_change@4
qbft_internal_test.go:318: 00:03.021 3@3 change to 4 ~= round_timeout
qbft_internal_test.go:352: 00:03.022 3 => round_change@4
qbft_internal_test.go:318: 00:04.006 4@4 change to 5 ~= round_timeout
qbft_internal_test.go:352: 00:04.007 4 => round_change@5
qbft_internal_test.go:318: 00:04.022 3@4 change to 5 ~= round_timeout
qbft_internal_test.go:352: 00:04.022 3 => round_change@5
qbft_internal_test.go:367: 00:05.001 Node 1 starting 5s
qbft_internal_test.go:318: 00:05.007 4@5 change to 6 ~= round_timeout
qbft_internal_test.go:352: 00:05.008 4 => round_change@6
qbft_internal_test.go:318: 00:05.022 3@5 change to 6 ~= round_timeout
qbft_internal_test.go:352: 00:05.022 3 => round_change@6
qbft_internal_test.go:321: 00:05.023 3 => round_change@6 -> 1@1 ~= f_plus_1_round_changes
```

```
qbft_internal_test.go:318: 00:05.026 1@1 change to 6 ~= f_plus_1_round_changes
qbft_internal_test.go:352: 00:05.027 1 => round_change@6
qbft_internal_test.go:321: 00:05.030 1 => round_change@6 -> 3@6 ~= quorum_round_changes
qbft_internal_test.go:352: 00:05.030 3 => pre_prepare@6
qbft_internal_test.go:321: 00:05.031 3 => pre_prepare@6 -> 1@6 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:05.031 1 => prepare@6
qbft_internal_test.go:321: 00:05.033 3 => pre_prepare@6 -> 3@6 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:05.033 3 => prepare@6
qbft_internal_test.go:321: 00:05.035 3 => pre_prepare@6 -> 4@6 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:05.035 4 => prepare@6
qbft_internal_test.go:321: 00:05.036 4 => prepare@6 -> 4@6 ~= quorum_prepares
qbft_internal_test.go:352: 00:05.036 4 => commit@6
qbft_internal_test.go:321: 00:05.036 4 => prepare@6 -> 1@6 ~= quorum_prepares
qbft_internal_test.go:352: 00:05.038 1 => commit@6
qbft_internal_test.go:321: 00:05.036 4 => prepare@6 -> 3@6 ~= quorum_prepares
qbft_internal_test.go:352: 00:05.039 3 => commit@6
qbft_internal_test.go:321: 00:05.041 3 => commit@6 -> 3@6 ~= quorum_commits
qbft_internal_test.go:321: 00:05.041 3 => commit@6 -> 1@6 ~= quorum_commits
qbft_internal_test.go:321: 00:05.041 3 => commit@6 -> 4@6 ~= quorum_commits
qbft_internal_test.go:367: 00:10.003 Node 2 starting 10s
qbft_internal_test.go:352: 00:10.003 2 => pre_prepare@1
qbft_internal_test.go:321: 00:10.004 2 => pre_prepare@1 -> 2@1 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:10.004 2 => prepare@1
qbft_internal_test.go:318: 00:11.004 2@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:11.004 2 => round_change@2
    qbft_internal_test.go:352: 00:11.005 4 => decided@6
    qbft_internal_test.go:321: 00:11.007 4 => decided@6 -> 2@2 ~= justified_decided
    qbft_internal_test.go:318: 00:11.007 2@2 change to 6 ~= justified_decided
    qbft_internal_test.go:87: Got all results in round 6 after 11.008s: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:1, peerIdx:1, round:6, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:1, peerIdx:3, round:6, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:1, peerIdx:4, round:6, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)}}
    qbft_internal_test.go:352: 00:11.009 1 => decided@6
    qbft_internal_test.go:352: 00:11.011 3 => decided@6
=== RUN   TestQBFT/stagger_start_exp
    qbft_internal_test.go:364: 00:00.000 Node 4 start delay 3s
    qbft_internal_test.go:364: 00:00.001 Node 1 start delay 0s
    qbft_internal_test.go:367: 00:00.002 Node 1 starting 0s
    qbft_internal_test.go:364: 00:00.003 Node 2 start delay 1s
    qbft_internal_test.go:364: 00:00.004 Node 3 start delay 2s
    qbft_internal_test.go:352: 00:00.005 1 => pre_prepare@1
    qbft_internal_test.go:321: 00:00.006 1 => pre_prepare@1 -> 1@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.006 1 => prepare@1
    qbft_internal_test.go:367: 00:01.003 Node 2 starting 1s
    qbft_internal_test.go:318: 00:01.006 1@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.013 1 => round_change@2
    qbft_internal_test.go:367: 00:02.005 Node 3 starting 2s
    qbft_internal_test.go:318: 00:02.014 2@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:02.015 2 => round_change@2
    qbft_internal_test.go:367: 00:03.000 Node 4 starting 3s
    qbft_internal_test.go:318: 00:03.010 3@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:03.010 3 => round_change@2
    qbft_internal_test.go:318: 00:03.013 1@2 change to 3 ~= round_timeout
    qbft_internal_test.go:352: 00:03.015 1 => round_change@3
    qbft_internal_test.go:321: 00:03.014 3 => round_change@2 -> 2@2 ~= quorum_round_changes
    qbft_internal_test.go:352: 00:03.015 2 => pre_prepare@2
    qbft_internal_test.go:321: 00:03.017 2 => pre_prepare@2 -> 3@2 ~= justified_pre_prepare
    qbft_internal_test.go:321: 00:03.017 2 => pre_prepare@2 -> 2@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:03.019 2 => prepare@2
    qbft_internal_test.go:352: 00:03.017 3 => prepare@2
    qbft_internal_test.go:321: 00:03.017 1 => round_change@3 -> 4@1 ~= f_plus_1_round_changes
    qbft_internal_test.go:318: 00:03.020 4@1 change to 2 ~= f_plus_1_round_changes
    qbft_internal_test.go:352: 00:03.021 4 => round_change@2
    qbft_internal_test.go:321: 00:03.024 2 => pre_prepare@2 -> 4@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:03.024 4 => prepare@2
    qbft_internal_test.go:321: 00:03.025 4 => prepare@2 -> 3@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:03.025 3 => commit@2
    qbft_internal_test.go:321: 00:03.028 4 => prepare@2 -> 2@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:03.029 2 => commit@2
    qbft_internal_test.go:321: 00:03.032 4 => prepare@2 -> 4@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:03.034 4 => commit@2
    qbft_internal_test.go:321: 00:03.035 4 => commit@2 -> 2@2 ~= quorum_commits
```

```
    qbft_internal_test.go:321: 00:03.035 4 => commit@2 -> 4@2 ~= quorum_commits
    qbft_internal_test.go:321: 00:03.036 4 => commit@2 -> 3@2 ~= quorum_commits
    qbft_internal_test.go:318: 00:07.016 1@3 change to 4 ~= round_timeout
    qbft_internal_test.go:352: 00:07.022 1 => round_change@4
    qbft_internal_test.go:352: 00:07.023 4 => decided@2
    qbft_internal_test.go:352: 00:07.024 2 => decided@2
    qbft_internal_test.go:321: 00:07.024 4 => decided@2 -> 1@4 ~= justified_decided
    qbft_internal_test.go:318: 00:07.026 1@4 change to 2 ~= justified_decided
    qbft_internal_test.go:352: 00:07.025 3 => decided@2
    qbft_internal_test.go:99: Got all results in round 2 after 7.027s: map[int64]qbft.Msg[int64,int64]
{2:qbft.msg{msgType:3, instance:0, peerIdx:2, round:2, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:0, peerIdx:3, round:2, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:0, peerIdx:4, round:2, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/stagger_start_const
    qbft_internal_test.go:364: 00:00.000 Node 1 start delay 0s
    qbft_internal_test.go:364: 00:00.001 Node 2 start delay 1s
    qbft_internal_test.go:364: 00:00.002 Node 3 start delay 2s
    qbft_internal_test.go:364: 00:00.003 Node 4 start delay 3s
    qbft_internal_test.go:367: 00:00.005 Node 1 starting 0s
    qbft_internal_test.go:352: 00:00.007 1 => pre_prepare@1
    qbft_internal_test.go:321: 00:00.008 1 => pre_prepare@1 -> 1@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.009 1 => prepare@1
    qbft_internal_test.go:367: 00:01.004 Node 2 starting 1s
    qbft_internal_test.go:318: 00:01.009 1@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.009 1 => round_change@2
    qbft_internal_test.go:367: 00:02.004 Node 3 starting 2s
    qbft_internal_test.go:318: 00:02.005 2@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:02.005 2 => round_change@2
    qbft_internal_test.go:318: 00:02.009 1@2 change to 3 ~= round_timeout
    qbft_internal_test.go:352: 00:02.010 1 => round_change@3
    qbft_internal_test.go:321: 00:02.013 1 => round_change@3 -> 3@1 ~= f_plus_1_round_changes
    qbft_internal_test.go:318: 00:02.013 3@1 change to 2 ~= f_plus_1_round_changes
    qbft_internal_test.go:352: 00:02.014 3 => round_change@2
    qbft_internal_test.go:321: 00:02.015 3 => round_change@2 -> 2@2 ~= quorum_round_changes
    qbft_internal_test.go:352: 00:02.015 2 => pre_prepare@2
    qbft_internal_test.go:321: 00:02.016 2 => pre_prepare@2 -> 2@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:02.016 2 => prepare@2
    qbft_internal_test.go:321: 00:02.018 2 => pre_prepare@2 -> 3@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:02.018 3 => prepare@2
    qbft_internal_test.go:367: 00:03.005 Node 4 starting 3s
    qbft_internal_test.go:318: 00:03.010 1@3 change to 4 ~= round_timeout
    qbft_internal_test.go:352: 00:03.010 1 => round_change@4
    qbft_internal_test.go:318: 00:03.016 2@2 change to 3 ~= round_timeout
    qbft_internal_test.go:352: 00:03.016 2 => round_change@3
    qbft_internal_test.go:321: 00:03.017 2 => round_change@3 -> 4@1 ~= f_plus_1_round_changes
    qbft_internal_test.go:318: 00:03.017 4@1 change to 3 ~= f_plus_1_round_changes
    qbft_internal_test.go:352: 00:03.017 4 => round_change@3
    qbft_internal_test.go:321: 00:03.020 2 => round_change@3 -> 3@2 ~= f_plus_1_round_changes
    qbft_internal_test.go:318: 00:03.020 3@2 change to 3 ~= f_plus_1_round_changes
    qbft_internal_test.go:352: 00:03.020 3 => round_change@3
    qbft_internal_test.go:321: 00:03.022 4 => round_change@3 -> 3@3 ~= quorum_round_changes
    qbft_internal_test.go:352: 00:03.022 3 => pre_prepare@3
    qbft_internal_test.go:321: 00:03.023 3 => pre_prepare@3 -> 4@3 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:03.023 4 => prepare@3
    qbft_internal_test.go:321: 00:03.026 3 => pre_prepare@3 -> 2@3 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:03.026 2 => prepare@3
    qbft_internal_test.go:321: 00:03.027 3 => pre_prepare@3 -> 3@3 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:03.027 3 => prepare@3
    qbft_internal_test.go:321: 00:03.028 3 => prepare@3 -> 2@3 ~= quorum_prepares
    qbft_internal_test.go:352: 00:03.028 2 => commit@3
    qbft_internal_test.go:321: 00:03.029 3 => prepare@3 -> 4@3 ~= quorum_prepares
    qbft_internal_test.go:352: 00:03.029 4 => commit@3
    qbft_internal_test.go:321: 00:03.030 3 => prepare@3 -> 3@3 ~= quorum_prepares
    qbft_internal_test.go:352: 00:03.030 3 => commit@3
    qbft_internal_test.go:321: 00:03.031 3 => commit@3 -> 2@3 ~= quorum_commits
    qbft_internal_test.go:321: 00:03.032 3 => commit@3 -> 4@3 ~= quorum_commits
    qbft_internal_test.go:321: 00:03.033 3 => commit@3 -> 3@3 ~= quorum_commits
    qbft_internal_test.go:318: 00:04.010 1@4 change to 5 ~= round_timeout
    qbft_internal_test.go:352: 00:04.012 1 => round_change@5
    qbft_internal_test.go:352: 00:04.013 4 => decided@3
    qbft_internal_test.go:321: 00:04.015 4 => decided@3 -> 1@5 ~= justified_decided
    qbft_internal_test.go:318: 00:04.015 1@5 change to 3 ~= justified_decided
```

```
    qbft_internal_test.go:352: 00:04.015 2 => decided@3
    qbft_internal_test.go:112: Got all results in round 3 after 4.016s: map[int64]qbft.Msg[int64,int64]
{2:qbft.msg{msgType:3, instance:0, peerIdx:2, round:3, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:0, peerIdx:3, round:3, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:0, peerIdx:4, round:3, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)}}
    qbft_internal_test.go:352: 00:04.016 3 => decided@3
=== RUN   TestQBFT/very_delayed_value_exp
    qbft_internal_test.go:318: 00:01.000 1@1 change to 2 ~= round_timeout
    qbft_internal_test.go:318: 00:01.000 2@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.000 2 => round_change@2
    qbft_internal_test.go:352: 00:01.000 1 => round_change@2
    qbft_internal_test.go:318: 00:01.002 3@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.003 3 => round_change@2
    qbft_internal_test.go:321: 00:01.004 1 => round_change@2 -> 4@1 ~= f_plus_1_round_changes
    qbft_internal_test.go:318: 00:01.006 4@1 change to 2 ~= f_plus_1_round_changes
    qbft_internal_test.go:352: 00:01.006 4 => round_change@2
    qbft_internal_test.go:321: 00:01.005 3 => round_change@2 -> 1@2 ~= quorum_round_changes
    qbft_internal_test.go:318: 00:03.000 1@2 change to 3 ~= round_timeout
    qbft_internal_test.go:352: 00:03.002 1 => round_change@3
    qbft_internal_test.go:318: 00:03.001 2@2 change to 3 ~= round_timeout
    qbft_internal_test.go:318: 00:03.003 3@2 change to 3 ~= round_timeout
    qbft_internal_test.go:318: 00:03.007 4@2 change to 3 ~= round_timeout
    qbft_internal_test.go:352: 00:03.010 4 => round_change@3
    qbft_internal_test.go:352: 00:03.008 3 => round_change@3
    qbft_internal_test.go:352: 00:03.007 2 => round_change@3
    qbft_internal_test.go:321: 00:03.018 4 => round_change@3 -> 2@3 ~= quorum_round_changes
    qbft_internal_test.go:318: 00:07.003 1@3 change to 4 ~= round_timeout
    qbft_internal_test.go:352: 00:07.006 1 => round_change@4
    qbft_internal_test.go:318: 00:07.007 2@3 change to 4 ~= round_timeout
    qbft_internal_test.go:352: 00:07.008 2 => round_change@4
    qbft_internal_test.go:318: 00:07.008 3@3 change to 4 ~= round_timeout
    qbft_internal_test.go:352: 00:07.008 3 => round_change@4
    qbft_internal_test.go:321: 00:07.009 2 => round_change@4 -> 3@4 ~= quorum_round_changes
    qbft_internal_test.go:352: 00:07.009 3 => pre_prepare@4
    qbft_internal_test.go:321: 00:07.010 3 => pre_prepare@4 -> 2@4 ~= justified_pre_prepare
    qbft_internal_test.go:321: 00:07.010 3 => pre_prepare@4 -> 1@4 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:07.012 1 => prepare@4
    qbft_internal_test.go:352: 00:07.010 2 => prepare@4
    qbft_internal_test.go:318: 00:07.009 4@3 change to 4 ~= round_timeout
    qbft_internal_test.go:352: 00:07.012 4 => round_change@4
    qbft_internal_test.go:321: 00:07.011 3 => pre_prepare@4 -> 3@4 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:07.012 3 => prepare@4
    qbft_internal_test.go:321: 00:07.013 2 => prepare@4 -> 3@4 ~= quorum_prepares
    qbft_internal_test.go:352: 00:07.013 3 => commit@4
    qbft_internal_test.go:321: 00:07.015 3 => prepare@4 -> 1@4 ~= quorum_prepares
    qbft_internal_test.go:352: 00:07.015 1 => commit@4
    qbft_internal_test.go:321: 00:07.017 3 => prepare@4 -> 2@4 ~= quorum_prepares
    qbft_internal_test.go:352: 00:07.017 2 => commit@4
    qbft_internal_test.go:321: 00:07.018 2 => commit@4 -> 3@4 ~= quorum_commits
    qbft_internal_test.go:321: 00:07.019 3 => pre_prepare@4 -> 4@4 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:07.019 4 => prepare@4
    qbft_internal_test.go:321: 00:07.020 2 => commit@4 -> 1@4 ~= quorum_commits
    qbft_internal_test.go:321: 00:07.021 2 => commit@4 -> 2@4 ~= quorum_commits
    qbft_internal_test.go:321: 00:07.022 3 => prepare@4 -> 4@4 ~= quorum_prepares
    qbft_internal_test.go:352: 00:07.022 4 => commit@4
    qbft_internal_test.go:321: 00:07.023 2 => commit@4 -> 4@4 ~= quorum_commits
    qbft_internal_test.go:126: Got all results in round 4 after 7.024s: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:3, peerIdx:1, round:4, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)},
2:qbft.msg{msgType:3, instance:3, peerIdx:2, round:4, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:3, peerIdx:3, round:4, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/very_delayed_value_const
    qbft_internal_test.go:318: 00:01.000 4@1 change to 2 ~= round_timeout
    qbft_internal_test.go:318: 00:01.002 2@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.002 2 => round_change@2
    qbft_internal_test.go:352: 00:01.002 4 => round_change@2
    qbft_internal_test.go:318: 00:01.002 1@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.002 1 => round_change@2
    qbft_internal_test.go:318: 00:01.005 3@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.005 3 => round_change@2
    qbft_internal_test.go:321: 00:01.008 1 => round_change@2 -> 3@2 ~= quorum_round_changes
    qbft_internal_test.go:352: 00:01.008 3 => pre_prepare@2
    qbft_internal_test.go:321: 00:01.009 3 => pre_prepare@2 -> 2@2 ~= justified_pre_prepare
```

```
    qbft_internal_test.go:352: 00:01.009 2 => prepare@2
    qbft_internal_test.go:321: 00:01.011 3 => pre_prepare@2 -> 1@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.011 1 => prepare@2
    qbft_internal_test.go:321: 00:01.013 3 => pre_prepare@2 -> 3@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.013 3 => prepare@2
    qbft_internal_test.go:321: 00:01.014 3 => prepare@2 -> 2@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:01.014 2 => commit@2
    qbft_internal_test.go:321: 00:01.016 3 => pre_prepare@2 -> 4@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.016 4 => prepare@2
    qbft_internal_test.go:321: 00:01.018 3 => prepare@2 -> 1@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:01.018 1 => commit@2
    qbft_internal_test.go:321: 00:01.020 3 => prepare@2 -> 4@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:01.020 4 => commit@2
    qbft_internal_test.go:321: 00:01.021 4 => commit@2 -> 2@2 ~= quorum_commits
    qbft_internal_test.go:321: 00:01.022 4 => commit@2 -> 4@2 ~= quorum_commits
    qbft_internal_test.go:321: 00:01.021 4 => commit@2 -> 1@2 ~= quorum_commits
    qbft_internal_test.go:321: 00:01.020 3 => prepare@2 -> 3@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:01.023 3 => commit@2
    qbft_internal_test.go:321: 00:01.025 4 => commit@2 -> 3@2 ~= quorum_commits
    qbft_internal_test.go:137: Got all results in round 2 after 1.027s: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:1, peerIdx:1, round:2, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)},
2:qbft.msg{msgType:3, instance:1, peerIdx:2, round:2, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:1, peerIdx:4, round:2, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/stagger_delayed_value_exp
    qbft_internal_test.go:352: 00:00.006 1 => pre_prepare@1
    qbft_internal_test.go:321: 00:00.007 1 => pre_prepare@1 -> 4@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.007 4 => prepare@1
    qbft_internal_test.go:321: 00:00.009 1 => pre_prepare@1 -> 1@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.009 1 => prepare@1
    qbft_internal_test.go:321: 00:00.010 1 => pre_prepare@1 -> 2@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.010 2 => prepare@1
    qbft_internal_test.go:321: 00:00.011 2 => prepare@1 -> 4@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.011 4 => commit@1
    qbft_internal_test.go:321: 00:00.013 1 => pre_prepare@1 -> 3@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.013 3 => prepare@1
    qbft_internal_test.go:321: 00:00.015 2 => prepare@1 -> 1@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.015 1 => commit@1
    qbft_internal_test.go:321: 00:00.015 2 => prepare@1 -> 2@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.017 2 => commit@1
    qbft_internal_test.go:321: 00:00.017 2 => prepare@1 -> 3@1 ~= quorum_prepares
    qbft_internal_test.go:321: 00:00.019 2 => commit@1 -> 4@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.020 2 => commit@1 -> 2@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.020 2 => commit@1 -> 1@1 ~= quorum_commits
    qbft_internal_test.go:352: 00:00.019 3 => commit@1
    qbft_internal_test.go:321: 00:00.024 2 => commit@1 -> 3@1 ~= quorum_commits
    qbft_internal_test.go:149: Got all results in round 1 after 26ms: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:0, peerIdx:1, round:1, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
2:qbft.msg{msgType:3, instance:0, peerIdx:2, round:1, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:0, peerIdx:4, round:1, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/stagger_delayed_value_const
    qbft_internal_test.go:352: 00:00.005 1 => pre_prepare@1
    qbft_internal_test.go:321: 00:00.006 1 => pre_prepare@1 -> 4@1 ~= justified_pre_prepare
    qbft_internal_test.go:321: 00:00.006 1 => pre_prepare@1 -> 2@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.006 2 => prepare@1
    qbft_internal_test.go:352: 00:00.006 4 => prepare@1
    qbft_internal_test.go:321: 00:00.008 1 => pre_prepare@1 -> 3@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.010 3 => prepare@1
    qbft_internal_test.go:321: 00:00.009 1 => pre_prepare@1 -> 1@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.011 1 => prepare@1
    qbft_internal_test.go:321: 00:00.011 3 => prepare@1 -> 2@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.013 2 => commit@1
    qbft_internal_test.go:321: 00:00.013 3 => prepare@1 -> 1@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.015 1 => commit@1
    qbft_internal_test.go:321: 00:00.014 3 => prepare@1 -> 4@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.017 4 => commit@1
    qbft_internal_test.go:321: 00:00.012 3 => prepare@1 -> 3@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.017 3 => commit@1
    qbft_internal_test.go:321: 00:00.018 1 => commit@1 -> 3@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.019 4 => commit@1 -> 1@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.020 4 => commit@1 -> 2@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.021 1 => commit@1 -> 4@1 ~= quorum_commits
    qbft_internal_test.go:162: Got all results in round 1 after 22ms: map[int64]qbft.Msg[int64,int64]
```

```
{1:qbft.msg{msgType:3, instance:0, peerIdx:1, round:1, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
2:qbft.msg{msgType:3, instance:0, peerIdx:2, round:1, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:0, peerIdx:3, round:1, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:0, peerIdx:4, round:1, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/round_1_leader_no_value,_round_2_leader_offline
    qbft_internal_test.go:364: 00:00.002 Node 2 start delay 2s
    qbft_internal_test.go:318: 00:01.000 4@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.000 4 => round_change@2
    qbft_internal_test.go:318: 00:01.002 1@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.002 1 => round_change@2
    qbft_internal_test.go:318: 00:01.006 3@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.006 3 => round_change@2
    qbft_internal_test.go:318: 00:02.000 4@2 change to 3 ~= round_timeout
    qbft_internal_test.go:352: 00:02.001 4 => round_change@3
    qbft_internal_test.go:367: 00:02.003 Node 2 starting 2s
    qbft_internal_test.go:318: 00:02.003 1@2 change to 3 ~= round_timeout
    qbft_internal_test.go:352: 00:02.004 1 => round_change@3
    qbft_internal_test.go:321: 00:02.007 1 => round_change@3 -> 3@2 ~= f_plus_1_round_changes
    qbft_internal_test.go:318: 00:02.007 3@2 change to 3 ~= f_plus_1_round_changes
    qbft_internal_test.go:352: 00:02.008 3 => round_change@3
    qbft_internal_test.go:321: 00:02.009 3 => round_change@3 -> 3@3 ~= quorum_round_changes
    qbft_internal_test.go:352: 00:02.010 3 => pre_prepare@3
    qbft_internal_test.go:321: 00:02.011 3 => pre_prepare@3 -> 4@3 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:02.011 4 => prepare@3
    qbft_internal_test.go:321: 00:02.011 3 => round_change@3 -> 2@1 ~= f_plus_1_round_changes
    qbft_internal_test.go:318: 00:02.016 2@1 change to 3 ~= f_plus_1_round_changes
    qbft_internal_test.go:352: 00:02.016 2 => round_change@3
    qbft_internal_test.go:321: 00:02.013 3 => pre_prepare@3 -> 3@3 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:02.019 3 => prepare@3
    qbft_internal_test.go:321: 00:02.019 3 => pre_prepare@3 -> 2@3 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:02.024 2 => prepare@3
    qbft_internal_test.go:321: 00:02.014 3 => pre_prepare@3 -> 1@3 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:02.025 1 => prepare@3
    qbft_internal_test.go:321: 00:02.026 2 => prepare@3 -> 4@3 ~= quorum_prepares
    qbft_internal_test.go:352: 00:02.026 4 => commit@3
    qbft_internal_test.go:321: 00:02.026 2 => prepare@3 -> 2@3 ~= quorum_prepares
    qbft_internal_test.go:352: 00:02.027 2 => commit@3
    qbft_internal_test.go:321: 00:02.028 2 => prepare@3 -> 3@3 ~= quorum_prepares
    qbft_internal_test.go:352: 00:02.028 3 => commit@3
    qbft_internal_test.go:321: 00:02.029 2 => prepare@3 -> 1@3 ~= quorum_prepares
    qbft_internal_test.go:352: 00:02.031 1 => commit@3
    qbft_internal_test.go:321: 00:02.032 1 => commit@3 -> 3@3 ~= quorum_commits
    qbft_internal_test.go:321: 00:02.032 3 => commit@3 -> 2@3 ~= quorum_commits
    qbft_internal_test.go:321: 00:02.033 1 => commit@3 -> 4@3 ~= quorum_commits
    qbft_internal_test.go:321: 00:02.033 1 => commit@3 -> 1@3 ~= quorum_commits
    qbft_internal_test.go:176: Got all results in round 3 after 2.033s: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:0, peerIdx:1, round:3, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)},
2:qbft.msg{msgType:3, instance:0, peerIdx:2, round:3, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:0, peerIdx:3, round:3, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:0, peerIdx:4, round:3, value:3, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/500ms_jitter_exp
    qbft_internal_test.go:318: 00:01.000 4@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.000 4 => round_change@2
    qbft_internal_test.go:318: 00:01.002 1@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.002 1 => round_change@2
    qbft_internal_test.go:318: 00:01.002 2@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.002 2 => round_change@2
    qbft_internal_test.go:514: 00:01.002 1 => round_change@2 (bcast delay 571ms)
    qbft_internal_test.go:514: 00:01.002 2 => round_change@2 (bcast delay 580ms)
    qbft_internal_test.go:514: 00:01.002 4 => round_change@2 (bcast delay 527ms)
    qbft_internal_test.go:318: 00:01.004 3@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.006 3 => round_change@2
    qbft_internal_test.go:514: 00:01.006 3 => round_change@2 (bcast delay 756ms)
    qbft_internal_test.go:321: 00:01.588 2 => round_change@2 -> 1@2 ~= quorum_round_changes
    qbft_internal_test.go:352: 00:01.592 1 => pre_prepare@2
    qbft_internal_test.go:514: 00:01.600 1 => pre_prepare@2 (bcast delay 801ms)
    qbft_internal_test.go:321: 00:01.600 1 => pre_prepare@2 -> 1@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:01.605 1 => prepare@2
    qbft_internal_test.go:514: 00:01.606 1 => prepare@2 (bcast delay 918ms)
    qbft_internal_test.go:321: 00:02.402 1 => pre_prepare@2 -> 4@2 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:02.402 4 => prepare@2
    qbft_internal_test.go:321: 00:02.403 1 => pre_prepare@2 -> 2@2 ~= justified_pre_prepare
```

```
qbft_internal_test.go:352: 00:02.403 2 => prepare@2
qbft_internal_test.go:321: 00:02.404 1 => pre_prepare@2 -> 3@2 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:02.404 3 => prepare@2
qbft_internal_test.go:514: 00:02.405 4 => prepare@2 (bcast delay 696ms)
qbft_internal_test.go:514: 00:02.406 2 => prepare@2 (bcast delay 574ms)
qbft_internal_test.go:514: 00:02.407 3 => prepare@2 (bcast delay 526ms)
qbft_internal_test.go:321: 00:02.935 3 => prepare@2 -> 2@2 ~= quorum_prepares
qbft_internal_test.go:352: 00:02.939 2 => commit@2
qbft_internal_test.go:514: 00:02.939 2 => commit@2 (bcast delay 703ms)
qbft_internal_test.go:321: 00:02.934 3 => prepare@2 -> 4@2 ~= quorum_prepares
qbft_internal_test.go:352: 00:02.939 4 => commit@2
qbft_internal_test.go:514: 00:02.939 4 => commit@2 (bcast delay 658ms)
qbft_internal_test.go:321: 00:02.982 2 => prepare@2 -> 3@2 ~= quorum_prepares
qbft_internal_test.go:352: 00:02.983 3 => commit@2
qbft_internal_test.go:514: 00:02.983 3 => commit@2 (bcast delay 888ms)
qbft_internal_test.go:321: 00:02.982 2 => prepare@2 -> 1@2 ~= quorum_prepares
qbft_internal_test.go:352: 00:02.987 1 => commit@2
qbft_internal_test.go:514: 00:02.988 1 => commit@2 (bcast delay 523ms)
qbft_internal_test.go:321: 00:03.598 4 => commit@2 -> 3@2 ~= quorum_commits
qbft_internal_test.go:321: 00:03.599 4 => commit@2 -> 2@2 ~= quorum_commits
qbft_internal_test.go:318: 00:03.605 1@2 change to 3 ~= round_timeout
qbft_internal_test.go:352: 00:03.607 1 => round_change@3
qbft_internal_test.go:514: 00:03.607 1 => round_change@3 (bcast delay 554ms)
qbft_internal_test.go:321: 00:03.643 2 => commit@2 -> 4@2 ~= quorum_commits
    qbft_internal_test.go:352: 00:04.162 4 => decided@2
    qbft_internal_test.go:352: 00:04.162 2 => decided@2
    qbft_internal_test.go:514: 00:04.166 2 => decided@2 (bcast delay 863ms)
    qbft_internal_test.go:352: 00:04.163 3 => decided@2
    qbft_internal_test.go:514: 00:04.166 3 => decided@2 (bcast delay 920ms)
    qbft_internal_test.go:514: 00:04.164 4 => decided@2 (bcast delay 844ms)
    qbft_internal_test.go:321: 00:05.019 4 => decided@2 -> 1@3 ~= justified_decided
    qbft_internal_test.go:318: 00:05.019 1@3 change to 2 ~= justified_decided
    qbft_internal_test.go:190: Got all results in round 2 after 5.02s: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:3, peerIdx:1, round:2, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
2:qbft.msg{msgType:3, instance:3, peerIdx:2, round:2, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:3, peerIdx:3, round:2, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:3, peerIdx:4, round:2, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/200ms_jitter_const
    qbft_internal_test.go:318: 00:01.001 1@1 change to 2 ~= round_timeout
    qbft_internal_test.go:318: 00:01.002 4@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.002 4 => round_change@2
    qbft_internal_test.go:514: 00:01.002 4 => round_change@2 (bcast delay 205ms)
    qbft_internal_test.go:352: 00:01.002 1 => round_change@2
    qbft_internal_test.go:514: 00:01.002 1 => round_change@2 (bcast delay 380ms)
    qbft_internal_test.go:318: 00:01.002 3@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.002 3 => round_change@2
    qbft_internal_test.go:514: 00:01.002 3 => round_change@2 (bcast delay 243ms)
    qbft_internal_test.go:318: 00:01.004 2@1 change to 2 ~= round_timeout
qbft_internal_test.go:352: 00:01.004 2 => round_change@2
qbft_internal_test.go:514: 00:01.005 2 => round_change@2 (bcast delay 241ms)
qbft_internal_test.go:321: 00:01.250 3 => round_change@2 -> 1@2 ~= quorum_round_changes
qbft_internal_test.go:352: 00:01.250 1 => pre_prepare@2
qbft_internal_test.go:321: 00:01.250 1 => pre_prepare@2 -> 1@2 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:01.250 1 => prepare@2
qbft_internal_test.go:514: 00:01.251 1 => pre_prepare@2 (bcast delay 288ms)
qbft_internal_test.go:514: 00:01.252 1 => prepare@2 (bcast delay 369ms)
qbft_internal_test.go:321: 00:01.540 1 => pre_prepare@2 -> 4@2 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:01.540 4 => prepare@2
qbft_internal_test.go:321: 00:01.541 1 => pre_prepare@2 -> 2@2 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:01.541 2 => prepare@2
qbft_internal_test.go:321: 00:01.542 1 => pre_prepare@2 -> 3@2 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:01.542 3 => prepare@2
qbft_internal_test.go:514: 00:01.543 4 => prepare@2 (bcast delay 234ms)
qbft_internal_test.go:514: 00:01.544 2 => prepare@2 (bcast delay 269ms)
qbft_internal_test.go:514: 00:01.545 3 => prepare@2 (bcast delay 208ms)
qbft_internal_test.go:321: 00:01.754 3 => prepare@2 -> 4@2 ~= quorum_prepares
qbft_internal_test.go:352: 00:01.754 4 => commit@2
qbft_internal_test.go:321: 00:01.756 3 => prepare@2 -> 2@2 ~= quorum_prepares
qbft_internal_test.go:352: 00:01.756 2 => commit@2
qbft_internal_test.go:514: 00:01.757 4 => commit@2 (bcast delay 308ms)
qbft_internal_test.go:514: 00:01.758 2 => commit@2 (bcast delay 362ms)
qbft_internal_test.go:321: 00:01.778 4 => prepare@2 -> 3@2 ~= quorum_prepares
```

```
    qbft_internal_test.go:352: 00:01.778 3 => commit@2
    qbft_internal_test.go:321: 00:01.779 4 => prepare@2 -> 1@2 ~= quorum_prepares
    qbft_internal_test.go:352: 00:01.779 1 => commit@2
    qbft_internal_test.go:514: 00:01.781 3 => commit@2 (bcast delay 332ms)
    qbft_internal_test.go:514: 00:01.782 1 => commit@2 (bcast delay 280ms)
    qbft_internal_test.go:321: 00:02.066 4 => commit@2 -> 3@2 ~= quorum_commits
    qbft_internal_test.go:321: 00:02.066 4 => commit@2 -> 2@2 ~= quorum_commits
    qbft_internal_test.go:321: 00:02.114 3 => commit@2 -> 4@2 ~= quorum_commits
    qbft_internal_test.go:321: 00:02.115 3 => commit@2 -> 1@2 ~= quorum_commits
    qbft_internal_test.go:198: Got all results in round 2 after 2.116s: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:3, peerIdx:1, round:2, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
2:qbft.msg{msgType:3, instance:3, peerIdx:2, round:2, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:3, peerIdx:3, round:2, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:3, peerIdx:4, round:2, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/drop_10%_const
    qbft_internal_test.go:352: 00:00.005 2 => pre_prepare@1
    qbft_internal_test.go:321: 00:00.006 2 => pre_prepare@1 -> 4@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.006 4 => prepare@1
    qbft_internal_test.go:321: 00:00.008 2 => pre_prepare@1 -> 2@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.008 2 => prepare@1
    qbft_internal_test.go:321: 00:00.010 2 => pre_prepare@1 -> 1@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.010 1 => prepare@1
    qbft_internal_test.go:321: 00:00.011 1 => prepare@1 -> 4@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.011 4 => commit@1
    qbft_internal_test.go:207: 00:00.012 4 => commit@1 => 2 (dropped)
    qbft_internal_test.go:321: 00:00.014 2 => pre_prepare@1 -> 3@1 ~= justified_pre_prepare
    qbft_internal_test.go:321: 00:00.013 1 => prepare@1 -> 2@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.015 2 => commit@1
    qbft_internal_test.go:352: 00:00.014 3 => prepare@1
    qbft_internal_test.go:321: 00:00.015 1 => prepare@1 -> 1@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.015 1 => commit@1
    qbft_internal_test.go:321: 00:00.016 2 => commit@1 -> 1@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.018 1 => commit@1 -> 4@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.019 1 => prepare@1 -> 3@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.019 3 => commit@1
    qbft_internal_test.go:207: 00:00.020 3 => commit@1 => 1 (dropped)
    qbft_internal_test.go:321: 00:00.020 1 => commit@1 -> 3@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.021 3 => commit@1 -> 2@1 ~= quorum_commits
    qbft_internal_test.go:207: Got all results in round 1 after 22ms: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:1, peerIdx:1, round:1, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
2:qbft.msg{msgType:3, instance:1, peerIdx:2, round:1, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:1, peerIdx:3, round:1, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:1, peerIdx:4, round:1, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/drop_30%_const
    qbft_internal_test.go:352: 00:00.005 2 => pre_prepare@1
    qbft_internal_test.go:221: 00:00.006 2 => pre_prepare@1 => 1 (dropped)
    qbft_internal_test.go:321: 00:00.006 2 => pre_prepare@1 -> 3@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.006 3 => prepare@1
    qbft_internal_test.go:221: 00:00.007 3 => prepare@1 => 1 (dropped)
    qbft_internal_test.go:221: 00:00.007 3 => prepare@1 => 4 (dropped)
    qbft_internal_test.go:321: 00:00.008 2 => pre_prepare@1 -> 2@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.008 2 => prepare@1
    qbft_internal_test.go:221: 00:00.009 2 => prepare@1 => 1 (dropped)
    qbft_internal_test.go:321: 00:00.010 2 => pre_prepare@1 -> 4@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.010 4 => prepare@1
    qbft_internal_test.go:221: 00:00.011 4 => prepare@1 => 2 (dropped)
    qbft_internal_test.go:321: 00:00.011 4 => prepare@1 -> 3@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.011 3 => commit@1
    qbft_internal_test.go:221: 00:00.012 3 => commit@1 => 4 (dropped)
    qbft_internal_test.go:318: 00:01.001 1@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.001 1 => round_change@2
    qbft_internal_test.go:221: 00:01.002 1 => round_change@2 => 3 (dropped)
    qbft_internal_test.go:318: 00:01.006 3@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.006 3 => round_change@2
    qbft_internal_test.go:221: 00:01.007 3 => round_change@2 => 2 (dropped)
    qbft_internal_test.go:321: 00:01.007 3 => round_change@2 -> 4@1 ~= f_plus_1_round_changes
    qbft_internal_test.go:318: 00:01.007 4@1 change to 2 ~= f_plus_1_round_changes
    qbft_internal_test.go:352: 00:01.007 4 => round_change@2
    qbft_internal_test.go:318: 00:01.011 2@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.011 2 => round_change@2
    qbft_internal_test.go:221: 00:01.012 2 => round_change@2 => 1 (dropped)
    qbft_internal_test.go:321: 00:01.012 2 => round_change@2 -> 3@2 ~= quorum_round_changes
```

```
qbft_internal_test.go:352: 00:01.012 3 => pre_prepare@2
qbft_internal_test.go:221: 00:01.013 3 => pre_prepare@2 => 1 (dropped)
qbft_internal_test.go:321: 00:01.013 3 => pre_prepare@2 -> 3@2 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:01.013 3 => prepare@2
qbft_internal_test.go:221: 00:01.014 3 => prepare@2 => 1 (dropped)
qbft_internal_test.go:221: 00:01.014 3 => prepare@2 => 4 (dropped)
qbft_internal_test.go:321: 00:01.015 3 => pre_prepare@2 -> 2@2 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:01.015 2 => prepare@2
qbft_internal_test.go:321: 00:01.017 3 => pre_prepare@2 -> 4@2 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:01.017 4 => prepare@2
qbft_internal_test.go:321: 00:01.019 4 => prepare@2 -> 2@2 ~= quorum_prepares
qbft_internal_test.go:352: 00:01.019 2 => commit@2
qbft_internal_test.go:221: 00:01.020 2 => commit@2 => 3 (dropped)
qbft_internal_test.go:321: 00:01.021 4 => prepare@2 -> 3@2 ~= quorum_prepares
qbft_internal_test.go:352: 00:01.021 3 => commit@2
qbft_internal_test.go:221: 00:01.022 3 => commit@2 => 4 (dropped)
qbft_internal_test.go:318: 00:02.001 1@2 change to 3 ~= round_timeout
qbft_internal_test.go:352: 00:02.002 1 => round_change@3
qbft_internal_test.go:318: 00:02.013 3@2 change to 3 ~= round_timeout
qbft_internal_test.go:352: 00:02.014 3 => round_change@3
qbft_internal_test.go:318: 00:02.015 2@2 change to 3 ~= round_timeout
qbft_internal_test.go:352: 00:02.016 2 => round_change@3
qbft_internal_test.go:221: 00:02.016 3 => round_change@3 => 1 (dropped)
qbft_internal_test.go:221: 00:02.016 3 => round_change@3 => 2 (dropped)
qbft_internal_test.go:321: 00:02.018 3 => round_change@3 -> 4@2 ~= f_plus_1_round_changes
qbft_internal_test.go:318: 00:02.018 4@2 change to 3 ~= f_plus_1_round_changes
qbft_internal_test.go:352: 00:02.018 4 => round_change@3
qbft_internal_test.go:318: 00:03.002 1@3 change to 4 ~= round_timeout
qbft_internal_test.go:352: 00:03.004 1 => round_change@4
qbft_internal_test.go:318: 00:03.014 3@3 change to 4 ~= round_timeout
qbft_internal_test.go:318: 00:03.016 2@3 change to 4 ~= round_timeout
qbft_internal_test.go:352: 00:03.019 2 => round_change@4
qbft_internal_test.go:318: 00:03.019 4@3 change to 4 ~= round_timeout
qbft_internal_test.go:352: 00:03.024 4 => round_change@4
qbft_internal_test.go:221: 00:03.024 2 => round_change@4 => 3 (dropped)
qbft_internal_test.go:221: 00:03.024 4 => round_change@4 => 1 (dropped)
qbft_internal_test.go:221: 00:03.024 4 => round_change@4 => 3 (dropped)
qbft_internal_test.go:352: 00:03.018 3 => round_change@4
qbft_internal_test.go:221: 00:03.027 3 => round_change@4 => 1 (dropped)
qbft_internal_test.go:318: 00:04.004 1@4 change to 5 ~= round_timeout
qbft_internal_test.go:352: 00:04.007 1 => round_change@5
qbft_internal_test.go:221: 00:04.009 1 => round_change@5 => 3 (dropped)
qbft_internal_test.go:318: 00:04.017 3@4 change to 5 ~= round_timeout
qbft_internal_test.go:352: 00:04.017 3 => round_change@5
qbft_internal_test.go:318: 00:04.019 2@4 change to 5 ~= round_timeout
qbft_internal_test.go:352: 00:04.020 2 => round_change@5
qbft_internal_test.go:221: 00:04.020 3 => round_change@5 => 1 (dropped)
qbft_internal_test.go:221: 00:04.020 3 => round_change@5 => 2 (dropped)
qbft_internal_test.go:221: 00:04.020 3 => round_change@5 => 4 (dropped)
qbft_internal_test.go:221: 00:04.020 2 => round_change@5 => 4 (dropped)
qbft_internal_test.go:318: 00:04.024 4@4 change to 5 ~= round_timeout
qbft_internal_test.go:352: 00:04.025 4 => round_change@5
qbft_internal_test.go:321: 00:04.029 4 => round_change@5 -> 2@5 ~= quorum_round_changes
qbft_internal_test.go:352: 00:04.032 2 => pre_prepare@5
qbft_internal_test.go:321: 00:04.035 2 => pre_prepare@5 -> 2@5 ~= justified_pre_prepare
qbft_internal_test.go:321: 00:04.035 2 => pre_prepare@5 -> 3@5 ~= justified_pre_prepare
qbft_internal_test.go:321: 00:04.035 2 => pre_prepare@5 -> 4@5 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:04.037 4 => prepare@5
qbft_internal_test.go:352: 00:04.035 2 => prepare@5
qbft_internal_test.go:352: 00:04.036 3 => prepare@5
qbft_internal_test.go:321: 00:04.035 2 => pre_prepare@5 -> 1@5 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:04.039 1 => prepare@5
qbft_internal_test.go:221: 00:04.040 1 => prepare@5 => 2 (dropped)
qbft_internal_test.go:321: 00:04.040 3 => prepare@5 -> 4@5 ~= quorum_prepares
qbft_internal_test.go:321: 00:04.040 2 => prepare@5 -> 3@5 ~= quorum_prepares
qbft_internal_test.go:352: 00:04.040 3 => commit@5
qbft_internal_test.go:321: 00:04.041 3 => prepare@5 -> 2@5 ~= quorum_prepares
qbft_internal_test.go:352: 00:04.042 2 => commit@5
qbft_internal_test.go:321: 00:04.040 3 => prepare@5 -> 1@5 ~= quorum_prepares
qbft_internal_test.go:221: 00:04.044 2 => commit@5 => 3 (dropped)
qbft_internal_test.go:352: 00:04.044 1 => commit@5
qbft_internal_test.go:352: 00:04.041 4 => commit@5
```

```
    qbft_internal_test.go:221: 00:04.047 1 => commit@5 => 3 (dropped)
    qbft_internal_test.go:221: 00:04.047 4 => commit@5 => 3 (dropped)
    qbft_internal_test.go:221: 00:04.047 4 => commit@5 => 2 (dropped)
    qbft_internal_test.go:321: 00:04.047 1 => commit@5 -> 2@5 ~= quorum_commits
    qbft_internal_test.go:321: 00:04.048 1 => commit@5 -> 1@5 ~= quorum_commits
    qbft_internal_test.go:321: 00:04.048 4 => commit@5 -> 4@5 ~= quorum_commits
    qbft_internal_test.go:318: 00:05.036 3@5 change to 6 ~= round_timeout
    qbft_internal_test.go:352: 00:05.039 3 => round_change@6
    qbft_internal_test.go:221: 00:05.041 3 => round_change@6 => 4 (dropped)
    qbft_internal_test.go:352: 00:05.041 2 => decided@5
    qbft_internal_test.go:352: 00:05.041 1 => decided@5
    qbft_internal_test.go:221: 00:05.043 2 => decided@5 => 1 (dropped)
    qbft_internal_test.go:321: 00:05.044 2 => decided@5 -> 3@6 ~= justified_decided
    qbft_internal_test.go:318: 00:05.045 3@6 change to 5 ~= justified_decided
    qbft_internal_test.go:221: Got all results in round 5 after 5.046s: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:1, peerIdx:1, round:5, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
2:qbft.msg{msgType:3, instance:1, peerIdx:2, round:5, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:1, peerIdx:3, round:5, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:1, peerIdx:4, round:5, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/fuzz
    qbft_internal_test.go:352: 00:00.003 2 => pre_prepare@1
    qbft_internal_test.go:321: 00:00.004 2 => pre_prepare@1 -> 2@1 ~= justified_pre_prepare
    qbft_internal_test.go:321: 00:00.005 2 => pre_prepare@1 -> 1@1 ~= justified_pre_prepare
    qbft_internal_test.go:321: 00:00.005 2 => pre_prepare@1 -> 3@1 ~= justified_pre_prepare
    qbft_internal_test.go:321: 00:00.006 2 => pre_prepare@1 -> 4@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:00.007 4 => prepare@1
    qbft_internal_test.go:352: 00:00.007 2 => prepare@1
    qbft_internal_test.go:352: 00:00.007 1 => prepare@1
    qbft_internal_test.go:352: 00:00.007 3 => prepare@1
    qbft_internal_test.go:321: 00:00.008 2 => prepare@1 -> 1@1 ~= quorum_prepares
    qbft_internal_test.go:321: 00:00.010 1 => prepare@1 -> 3@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.011 3 => commit@1
    qbft_internal_test.go:321: 00:00.008 1 => prepare@1 -> 4@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.012 4 => commit@1
    qbft_internal_test.go:352: 00:00.010 1 => commit@1
    qbft_internal_test.go:321: 00:00.009 1 => prepare@1 -> 2@1 ~= quorum_prepares
    qbft_internal_test.go:352: 00:00.012 2 => commit@1
    qbft_internal_test.go:321: 00:00.013 4 => commit@1 -> 1@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.014 1 => commit@1 -> 3@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.016 1 => commit@1 -> 2@1 ~= quorum_commits
    qbft_internal_test.go:321: 00:00.014 1 => commit@1 -> 4@1 ~= quorum_commits
    qbft_internal_test.go:235: Got all results in round 1 after 16ms: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:1, peerIdx:1, round:1, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:1, peerIdx:3, round:1, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:1, peerIdx:4, round:1, value:2, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/fuzz_with_late_leader
    qbft_internal_test.go:364: 00:00.001 Node 1 start delay 2s
    qbft_internal_test.go:364: 00:00.001 Node 2 start delay 2s
    qbft_internal_test.go:318: 00:01.001 4@1 change to 2 ~= round_timeout
    qbft_internal_test.go:318: 00:01.001 3@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.003 3 => round_change@2
    qbft_internal_test.go:352: 00:01.001 4 => round_change@2
    qbft_internal_test.go:318: 00:02.004 4@2 change to 3 ~= round_timeout
    qbft_internal_test.go:352: 00:02.006 4 => round_change@3
    qbft_internal_test.go:367: 00:02.003 Node 2 starting 2s
    qbft_internal_test.go:318: 00:02.003 3@2 change to 3 ~= round_timeout
    qbft_internal_test.go:367: 00:02.004 Node 1 starting 2s
    qbft_internal_test.go:352: 00:02.008 3 => round_change@3
    qbft_internal_test.go:352: 00:02.008 2 => pre_prepare@1
    qbft_internal_test.go:321: 00:02.011 2 => pre_prepare@1 -> 2@1 ~= justified_pre_prepare
    qbft_internal_test.go:321: 00:02.011 2 => pre_prepare@1 -> 1@1 ~= justified_pre_prepare
    qbft_internal_test.go:352: 00:02.011 1 => prepare@1
    qbft_internal_test.go:352: 00:02.011 2 => prepare@1
    qbft_internal_test.go:321: 00:02.012 3 => round_change@3 -> 2@1 ~= f_plus_1_round_changes
    qbft_internal_test.go:318: 00:02.012 2@1 change to 3 ~= f_plus_1_round_changes
    qbft_internal_test.go:352: 00:02.013 2 => round_change@3
    qbft_internal_test.go:321: 00:02.015 2 => round_change@3 -> 1@1 ~= f_plus_1_round_changes
    qbft_internal_test.go:318: 00:02.016 1@1 change to 3 ~= f_plus_1_round_changes
    qbft_internal_test.go:352: 00:02.016 1 => round_change@3
    qbft_internal_test.go:318: 00:03.006 4@3 change to 4 ~= round_timeout
    qbft_internal_test.go:352: 00:03.010 4 => round_change@4
    qbft_internal_test.go:318: 00:03.008 3@3 change to 4 ~= round_timeout
```

```
qbft_internal_test.go:352: 00:03.012 3 => round_change@4
qbft_internal_test.go:318: 00:03.013 2@3 change to 4 ~= round_timeout
qbft_internal_test.go:352: 00:03.016 2 => round_change@4
qbft_internal_test.go:318: 00:03.017 1@3 change to 4 ~= round_timeout
qbft_internal_test.go:352: 00:03.020 1 => round_change@4
qbft_internal_test.go:321: 00:03.023 2 => round_change@4 -> 1@4 ~= quorum_round_changes
qbft_internal_test.go:352: 00:03.025 1 => pre_prepare@4
qbft_internal_test.go:321: 00:03.027 1 => pre_prepare@4 -> 3@4 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:03.028 3 => prepare@4
qbft_internal_test.go:321: 00:03.027 1 => pre_prepare@4 -> 2@4 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:03.028 2 => prepare@4
qbft_internal_test.go:321: 00:03.028 1 => pre_prepare@4 -> 1@4 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:03.031 1 => prepare@4
qbft_internal_test.go:321: 00:03.028 1 => pre_prepare@4 -> 4@4 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:03.031 4 => prepare@4
qbft_internal_test.go:321: 00:03.033 4 => prepare@4 -> 3@4 ~= quorum_prepares
qbft_internal_test.go:352: 00:03.033 3 => commit@4
qbft_internal_test.go:321: 00:03.033 1 => prepare@4 -> 2@4 ~= quorum_prepares
qbft_internal_test.go:352: 00:03.034 2 => commit@4
qbft_internal_test.go:321: 00:03.034 4 => prepare@4 -> 1@4 ~= quorum_prepares
qbft_internal_test.go:352: 00:03.036 1 => commit@4
qbft_internal_test.go:321: 00:03.034 1 => prepare@4 -> 4@4 ~= quorum_prepares
qbft_internal_test.go:352: 00:03.037 4 => commit@4
qbft_internal_test.go:321: 00:03.039 4 => commit@4 -> 2@4 ~= quorum_commits
    qbft_internal_test.go:321: 00:03.039 4 => commit@4 -> 3@4 ~= quorum_commits
    qbft_internal_test.go:321: 00:03.039 2 => commit@4 -> 1@4 ~= quorum_commits
    qbft_internal_test.go:321: 00:03.041 4 => commit@4 -> 4@4 ~= quorum_commits
    qbft_internal_test.go:244: Got all results in round 4 after 3.044s: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:1, peerIdx:1, round:4, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
2:qbft.msg{msgType:3, instance:1, peerIdx:2, round:4, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
3:qbft.msg{msgType:3, instance:1, peerIdx:3, round:4, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:1, peerIdx:4, round:4, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)}}
=== RUN   TestQBFT/fuzz_with_very_late_leader
    qbft_internal_test.go:364: 00:00.000 Node 1 start delay 10s
    qbft_internal_test.go:364: 00:00.000 Node 2 start delay 10s
    qbft_internal_test.go:318: 00:01.001 3@1 change to 2 ~= round_timeout
    qbft_internal_test.go:318: 00:01.003 4@1 change to 2 ~= round_timeout
    qbft_internal_test.go:352: 00:01.003 4 => round_change@2
    qbft_internal_test.go:352: 00:01.003 3 => round_change@2
    qbft_internal_test.go:318: 00:02.003 4@2 change to 3 ~= round_timeout
    qbft_internal_test.go:352: 00:02.009 4 => round_change@3
    qbft_internal_test.go:318: 00:02.003 3@2 change to 3 ~= round_timeout
    qbft_internal_test.go:352: 00:02.010 3 => round_change@3
    qbft_internal_test.go:318: 00:03.009 4@3 change to 4 ~= round_timeout
    qbft_internal_test.go:352: 00:03.012 4 => round_change@4
    qbft_internal_test.go:318: 00:03.011 3@3 change to 4 ~= round_timeout
    qbft_internal_test.go:352: 00:03.015 3 => round_change@4
    qbft_internal_test.go:318: 00:04.012 4@4 change to 5 ~= round_timeout
qbft_internal_test.go:352: 00:04.014 4 => round_change@5
qbft_internal_test.go:318: 00:04.015 3@4 change to 5 ~= round_timeout
qbft_internal_test.go:352: 00:04.017 3 => round_change@5
qbft_internal_test.go:318: 00:05.014 4@5 change to 6 ~= round_timeout
qbft_internal_test.go:352: 00:05.014 4 => round_change@6
qbft_internal_test.go:318: 00:05.017 3@5 change to 6 ~= round_timeout
qbft_internal_test.go:352: 00:05.017 3 => round_change@6
qbft_internal_test.go:318: 00:06.015 4@6 change to 7 ~= round_timeout
qbft_internal_test.go:352: 00:06.018 4 => round_change@7
qbft_internal_test.go:318: 00:06.017 3@6 change to 7 ~= round_timeout
qbft_internal_test.go:352: 00:06.019 3 => round_change@7
qbft_internal_test.go:318: 00:07.018 4@7 change to 8 ~= round_timeout
qbft_internal_test.go:352: 00:07.021 4 => round_change@8
qbft_internal_test.go:318: 00:07.019 3@7 change to 8 ~= round_timeout
qbft_internal_test.go:352: 00:07.021 3 => round_change@8
qbft_internal_test.go:318: 00:08.021 3@8 change to 9 ~= round_timeout
qbft_internal_test.go:352: 00:08.021 3 => round_change@9
qbft_internal_test.go:318: 00:08.021 4@8 change to 9 ~= round_timeout
qbft_internal_test.go:352: 00:08.022 4 => round_change@9
qbft_internal_test.go:318: 00:09.021 3@9 change to 10 ~= round_timeout
qbft_internal_test.go:352: 00:09.021 3 => round_change@10
qbft_internal_test.go:318: 00:09.023 4@9 change to 10 ~= round_timeout
qbft_internal_test.go:352: 00:09.023 4 => round_change@10
qbft_internal_test.go:367: 00:10.001 Node 1 starting 10s
```

```
qbft_internal_test.go:367: 00:10.002 Node 2 starting 10s
qbft_internal_test.go:352: 00:10.004 2 => pre_prepare@1
qbft_internal_test.go:321: 00:10.005 2 => pre_prepare@1 -> 2@1 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:10.005 2 => prepare@1
qbft_internal_test.go:321: 00:10.006 2 => pre_prepare@1 -> 1@1 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:10.006 1 => prepare@1
qbft_internal_test.go:318: 00:10.021 3@10 change to 11 ~= round_timeout
qbft_internal_test.go:352: 00:10.021 3 => round_change@11
qbft_internal_test.go:318: 00:10.024 4@10 change to 11 ~= round_timeout
qbft_internal_test.go:352: 00:10.025 4 => round_change@11
qbft_internal_test.go:321: 00:10.026 4 => round_change@11 -> 1@1 ~= f_plus_1_round_changes
qbft_internal_test.go:318: 00:10.026 1@1 change to 11 ~= f_plus_1_round_changes
qbft_internal_test.go:321: 00:10.026 4 => round_change@11 -> 2@1 ~= f_plus_1_round_changes
qbft_internal_test.go:318: 00:10.028 2@1 change to 11 ~= f_plus_1_round_changes
qbft_internal_test.go:352: 00:10.029 2 => round_change@11
qbft_internal_test.go:352: 00:10.026 1 => round_change@11
qbft_internal_test.go:318: 00:11.021 3@11 change to 12 ~= round_timeout
qbft_internal_test.go:352: 00:11.021 3 => round_change@12
qbft_internal_test.go:318: 00:11.025 4@11 change to 12 ~= round_timeout
qbft_internal_test.go:352: 00:11.025 4 => round_change@12
qbft_internal_test.go:321: 00:11.027 4 => round_change@12 -> 2@11 ~= f_plus_1_round_changes
qbft_internal_test.go:318: 00:11.027 2@11 change to 12 ~= f_plus_1_round_changes
qbft_internal_test.go:352: 00:11.027 2 => round_change@12
qbft_internal_test.go:318: 00:11.029 1@11 change to 12 ~= round_timeout
qbft_internal_test.go:352: 00:11.029 1 => round_change@12
qbft_internal_test.go:321: 00:11.033 2 => round_change@12 -> 1@12 ~= quorum_round_changes
qbft_internal_test.go:352: 00:11.033 1 => pre_prepare@12
qbft_internal_test.go:321: 00:11.034 1 => pre_prepare@12 -> 4@12 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:11.034 4 => prepare@12
qbft_internal_test.go:321: 00:11.036 1 => pre_prepare@12 -> 1@12 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:11.036 1 => prepare@12
qbft_internal_test.go:321: 00:11.038 1 => pre_prepare@12 -> 2@12 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:11.038 2 => prepare@12
qbft_internal_test.go:321: 00:11.039 2 => prepare@12 -> 4@12 ~= quorum_prepares
qbft_internal_test.go:352: 00:11.039 4 => commit@12
qbft_internal_test.go:321: 00:11.041 1 => pre_prepare@12 -> 3@12 ~= justified_pre_prepare
qbft_internal_test.go:352: 00:11.041 3 => prepare@12
qbft_internal_test.go:321: 00:11.043 2 => prepare@12 -> 1@12 ~= quorum_prepares
qbft_internal_test.go:352: 00:11.043 1 => commit@12
qbft_internal_test.go:321: 00:11.045 2 => prepare@12 -> 2@12 ~= quorum_prepares
qbft_internal_test.go:352: 00:11.045 2 => commit@12
qbft_internal_test.go:321: 00:11.046 2 => commit@12 -> 4@12 ~= quorum_commits
qbft_internal_test.go:321: 00:11.047 2 => prepare@12 -> 3@12 ~= quorum_prepares
qbft_internal_test.go:352: 00:11.047 3 => commit@12
qbft_internal_test.go:321: 00:11.048 2 => commit@12 -> 1@12 ~= quorum_commits
qbft_internal_test.go:321: 00:11.049 2 => commit@12 -> 2@12 ~= quorum_commits
qbft_internal_test.go:321: 00:11.050 2 => commit@12 -> 3@12 ~= quorum_commits
qbft_internal_test.go:257: Got all results in round 12 after 11.051s: map[int64]qbft.Msg[int64,int64]
{1:qbft.msg{msgType:3, instance:1, peerIdx:1, round:12, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
2:qbft.msg{msgType:3, instance:1, peerIdx:2, round:12, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)},
4:qbft.msg{msgType:3, instance:1, peerIdx:4, round:12, value:1, pr:0, pv:0, justify:[]qbft.msg(nil)}}
--- PASS: TestQBFT (1.72s)
    --- PASS: TestQBFT/happy_0 (0.00s)
    --- PASS: TestQBFT/happy_1 (0.00s)
    --- PASS: TestQBFT/prepare_round_1,_decide_round_2 (0.02s)
    --- PASS: TestQBFT/prepare_round_2,_decide_round_3 (0.02s)
    --- PASS: TestQBFT/leader_late_exp (0.02s)
    --- PASS: TestQBFT/leader_down_const (0.04s)
    --- PASS: TestQBFT/very_late_exp (0.10s)
    --- PASS: TestQBFT/very_late_const (0.28s)
    --- PASS: TestQBFT/stagger_start_exp (0.39s)
    --- PASS: TestQBFT/stagger_start_const (0.13s)
    --- PASS: TestQBFT/very_delayed_value_exp (0.12s)
    --- PASS: TestQBFT/very_delayed_value_const (0.01s)
    --- PASS: TestQBFT/stagger_delayed_value_exp (0.00s)
    --- PASS: TestQBFT/stagger_delayed_value_const (0.00s)
    --- PASS: TestQBFT/round_1_leader_no_value,_round_2_leader_offline (0.09s)
    --- PASS: TestQBFT/500ms_jitter_exp (0.13s)
    --- PASS: TestQBFT/200ms_jitter_const (0.07s)
    --- PASS: TestQBFT/drop_10%_const (0.00s)
    --- PASS: TestQBFT/drop_30%_const (0.07s)
    --- PASS: TestQBFT/fuzz (0.00s)
```

```
    --- PASS: TestQBFT/fuzz_with_late_leader (0.02s)
    --- PASS: TestQBFT/fuzz_with_very_late_leader (0.22s)
=== RUN   TestIsJustifiedPrePrepare
--- PASS: TestIsJustifiedPrePrepare (0.00s)
=== RUN   TestFormulas
--- PASS: TestFormulas (0.00s)
=== RUN   TestDuplicatePrePreparesRules
14:18:54.870 [34mINFO [0m [32m          [0m UponRule                                {"rule":
"justified_pre_prepare", "round": 1}
14:18:54.870 [34mINFO [0m [32m          [0m UponRule                                {"rule":
"justified_pre_prepare", "round": 2}
--- PASS: TestDuplicatePrePreparesRules (0.00s)
PASS
coverage: 71.0% of statements
ok      github.com/obolnetwork/charon/core/qbft 2.421s  coverage: 71.0% of statements
=== RUN   TestResolveAttDuties
--- PASS: TestResolveAttDuties (0.01s)
=== RUN   TestResolveProdDuties
--- PASS: TestResolveProdDuties (0.00s)
=== RUN   TestResolveSyncCommDuties
--- PASS: TestResolveSyncCommDuties (0.01s)
=== RUN   TestIntegration
--- PASS: TestIntegration (0.00s)
=== RUN   TestSchedulerWait
=== RUN   TestSchedulerWait/wait_for_nothing
=== RUN   TestSchedulerWait/wait_for_genesis
14:18:53.732 [34mINFO [0m [32msched     [0m Sleeping until genesis time             {"genesis": "0001-
01-01 00:00:05 +0000 UTC", "sleep": "5s"}
=== RUN   TestSchedulerWait/wait_for_sync
14:18:53.765 [34mINFO [0m [32msched     [0m Waiting for beacon node to sync         {"distance": 0}
=== RUN   TestSchedulerWait/genesis_errors
14:18:53.775 [31mERRO [0m [32msched     [0m Failure getting genesis time: mock error
    core/scheduler/scheduler_test.go:125 .1
    testutil/beaconmock/beaconmock.go:293 .GenesisTime
    core/scheduler/scheduler.go:680 .waitChainStart
    core/scheduler/scheduler.go:102 .Run
    core/scheduler/scheduler_test.go:147 .func1
14:18:53.775 [31mERRO [0m [32msched     [0m Failure getting genesis time: mock error
    core/scheduler/scheduler_test.go:125 .1
    testutil/beaconmock/beaconmock.go:293 .GenesisTime
    core/scheduler/scheduler.go:680 .waitChainStart
    core/scheduler/scheduler.go:102 .Run
    core/scheduler/scheduler_test.go:147 .func1
14:18:53.775 [31mERRO [0m [32msched     [0m Failure getting genesis time: mock error
    core/scheduler/scheduler_test.go:125 .1
    testutil/beaconmock/beaconmock.go:293 .GenesisTime
    core/scheduler/scheduler.go:680 .waitChainStart
    core/scheduler/scheduler.go:102 .Run
    core/scheduler/scheduler_test.go:147 .func1
=== RUN   TestSchedulerWait/synced_errors
14:18:53.785 [31mERRO [0m [32msched     [0m Failure getting sync state: mock error
    core/scheduler/scheduler_test.go:135 .2
    testutil/beaconmock/beaconmock.go:207 .NodeSyncing
    core/scheduler/scheduler.go:705 .waitBeaconSync
    core/scheduler/scheduler.go:103 .Run
    core/scheduler/scheduler_test.go:147 .func1
14:18:53.785 [31mERRO [0m [32msched     [0m Failure getting sync state: mock error
    core/scheduler/scheduler_test.go:135 .2
    testutil/beaconmock/beaconmock.go:207 .NodeSyncing
    core/scheduler/scheduler.go:705 .waitBeaconSync
    core/scheduler/scheduler.go:103 .Run
    core/scheduler/scheduler_test.go:147 .func1
--- PASS: TestSchedulerWait (0.07s)
    --- PASS: TestSchedulerWait/wait_for_nothing (0.01s)
    --- PASS: TestSchedulerWait/wait_for_genesis (0.01s)
    --- PASS: TestSchedulerWait/wait_for_sync (0.03s)
    --- PASS: TestSchedulerWait/genesis_errors (0.01s)
    --- PASS: TestSchedulerWait/synced_errors (0.01s)
=== RUN   TestSchedulerDuties
=== RUN   TestSchedulerDuties/grouped
14:18:53.816 [35mDEBG [0m [32msched     [0m Slot ticked                             {"slot": 0}
14:18:53.816 [34mINFO [0m [32msched     [0m Resolved attester duty                  {"slot": 0, "vidx":
```

```
1, "pubkey": "914_d49", "epoch": 0}
14:18:53.816 [34mINFO [0m [32msched     [0m Resolved attester duty                  {"slot": 0, "vidx":
2, "pubkey": "8da_41e", "epoch": 0}
14:18:53.816 [34mINFO [0m [32msched     [0m Resolved attester duty                  {"slot": 0, "vidx":
3, "pubkey": "8ee_1a7", "epoch": 0}
14:18:53.816 [34mINFO [0m [32msched     [0m Resolved proposer duty                  {"slot": 0, "vidx":
1, "pubkey": "914_d49", "epoch": 0}
14:18:53.816 [35mDEBG [0m [32msched     [0m Slot ticked                             {"slot": 1}
14:18:53.816 [35mDEBG [0m [32msched     [0m Slot ticked                             {"slot": 2}
=== RUN   TestSchedulerDuties/spread
14:18:53.841 [35mDEBG [0m [32msched     [0m Slot ticked                             {"slot": 0}
14:18:53.841 [34mINFO [0m [32msched     [0m Resolved attester duty                  {"slot": 0, "vidx":
1, "pubkey": "914_d49", "epoch": 0}
14:18:53.841 [34mINFO [0m [32msched     [0m Resolved attester duty                  {"slot": 1, "vidx":
2, "pubkey": "8da_41e", "epoch": 0}
14:18:53.841 [34mINFO [0m [32msched     [0m Resolved attester duty                  {"slot": 2, "vidx":
3, "pubkey": "8ee_1a7", "epoch": 0}
14:18:53.841 [34mINFO [0m [32msched     [0m Resolved proposer duty                  {"slot": 0, "vidx":
1, "pubkey": "914_d49", "epoch": 0}
14:18:53.841 [34mINFO [0m [32msched     [0m Resolved proposer duty                  {"slot": 1, "vidx":
2, "pubkey": "8da_41e", "epoch": 0}
14:18:53.841 [34mINFO [0m [32msched     [0m Resolved proposer duty                  {"slot": 2, "vidx":
3, "pubkey": "8ee_1a7", "epoch": 0}
14:18:53.841 [35mDEBG [0m [32msched     [0m Slot ticked                             {"slot": 1}
14:18:53.841 [35mDEBG [0m [32msched     [0m Slot ticked                             {"slot": 2}
=== RUN   TestSchedulerDuties/spread_errors
14:18:53.850 [35mDEBG [0m [32msched     [0m Slot ticked                             {"slot": 0}
14:18:53.850 [34mINFO [0m [32msched     [0m Resolved attester duty                  {"slot": 0, "vidx":
1, "pubkey": "914_d49", "epoch": 0}
14:18:53.850 [34mINFO [0m [32msched     [0m Resolved attester duty                  {"slot": 1, "vidx":
2, "pubkey": "8da_41e", "epoch": 0}
14:18:53.850 [34mINFO [0m [32msched     [0m Resolved attester duty                  {"slot": 2, "vidx":
3, "pubkey": "8ee_1a7", "epoch": 0}
14:18:53.850 [33mWARN [0m [32msched     [0m Resolving duties error (retrying next slot): test error
{"slot": 0}
    core/scheduler/scheduler_test.go:203 .1
    testutil/beaconmock/beaconmock.go:220 .ProposerDuties
    core/scheduler/scheduler.go:370 .resolveProDuties
    core/scheduler/scheduler.go:269 .resolveDuties
    core/scheduler/scheduler.go:177 .scheduleSlot
    core/scheduler/scheduler.go:123 .Run
    core/scheduler/scheduler_test.go:267 .func1
14:18:53.850 [35mDEBG [0m [32msched     [0m Slot ticked                             {"slot": 1}
14:18:53.850 [34mINFO [0m [32msched     [0m Resolved proposer duty                  {"slot": 1, "vidx":
2, "pubkey": "8da_41e", "epoch": 0}
14:18:53.850 [34mINFO [0m [32msched     [0m Resolved proposer duty                  {"slot": 2, "vidx":
3, "pubkey": "8ee_1a7", "epoch": 0}
14:18:53.850 [35mDEBG [0m [32msched     [0m Slot ticked                             {"slot": 2}
--- PASS: TestSchedulerDuties (0.07s)
    --- PASS: TestSchedulerDuties/grouped (0.04s)
    --- PASS: TestSchedulerDuties/spread (0.02s)
    --- PASS: TestSchedulerDuties/spread_errors (0.01s)
=== RUN   TestScheduler_GetDuty
--- PASS: TestScheduler_GetDuty (0.09s)
=== RUN   TestNoActive
14:18:53.990 [35mDEBG [0m [32msched     [0m Slot ticked                             {"slot": 0}
14:18:53.990 [34mINFO [0m [32msched     [0m No active validators for slot           {"slot": 0}
14:18:53.990 [34mINFO [0m [32msched     [0m No active validators for slot           {"slot": 1}
14:18:53.990 [35mDEBG [0m [32msched     [0m Slot ticked                             {"slot": 1}
14:18:53.990 [34mINFO [0m [32msched     [0m No active validators for slot           {"slot": 2}
14:18:53.990 [35mDEBG [0m [32msched     [0m Slot ticked                             {"slot": 2}
14:18:53.990 [34mINFO [0m [32msched     [0m No active validators for slot           {"slot": 3}
--- PASS: TestNoActive (0.05s)
PASS
coverage: 36.1% of statements
ok      github.com/obolnetwork/charon/core/scheduler    1.545s  coverage: 36.1% of statements
=== RUN   TestSigAgg
=== RUN   TestSigAgg/invalid_threshold
=== RUN   TestSigAgg/threshold_sigs
=== RUN   TestSigAgg/partial_sigs
--- PASS: TestSigAgg (0.02s)
    --- PASS: TestSigAgg/invalid_threshold (0.00s)
```

```
    --- PASS: TestSigAgg/threshold_sigs (0.00s)
    --- PASS: TestSigAgg/partial_sigs (0.00s)
=== RUN   TestSigAgg_DutyAttester
14:18:53.503 [35mDEBG [0m [32msigagg    [0m Threshold aggregated partial signatures
--- PASS: TestSigAgg_DutyAttester (0.01s)
=== RUN   TestSigAgg_DutyRandao
14:18:53.597 [35mDEBG [0m [32msigagg    [0m Threshold aggregated partial signatures
--- PASS: TestSigAgg_DutyRandao (0.09s)
=== RUN   TestSigAgg_DutyExit
14:18:53.611 [35mDEBG [0m [32msigagg    [0m Threshold aggregated partial signatures
--- PASS: TestSigAgg_DutyExit (0.01s)
=== RUN   TestSigAgg_DutyProposer
=== RUN   TestSigAgg_DutyProposer/phase0_proposal
14:18:53.622 [35mDEBG [0m [32msigagg    [0m Threshold aggregated partial signatures
=== RUN   TestSigAgg_DutyProposer/altair_proposal
14:18:53.629 [35mDEBG [0m [32msigagg    [0m Threshold aggregated partial signatures
=== RUN   TestSigAgg_DutyProposer/bellatrix_proposal
14:18:53.643 [35mDEBG [0m [32msigagg    [0m Threshold aggregated partial signatures
=== RUN   TestSigAgg_DutyProposer/capella_proposal
14:18:53.653 [35mDEBG [0m [32msigagg    [0m Threshold aggregated partial signatures
=== RUN   TestSigAgg_DutyProposer/deneb_proposal
14:18:53.664 [35mDEBG [0m [32msigagg    [0m Threshold aggregated partial signatures
--- PASS: TestSigAgg_DutyProposer (0.05s)
    --- PASS: TestSigAgg_DutyProposer/phase0_proposal (0.01s)
    --- PASS: TestSigAgg_DutyProposer/altair_proposal (0.01s)
    --- PASS: TestSigAgg_DutyProposer/bellatrix_proposal (0.01s)
    --- PASS: TestSigAgg_DutyProposer/capella_proposal (0.01s)
    --- PASS: TestSigAgg_DutyProposer/deneb_proposal (0.01s)
=== RUN   TestSigAgg_DutyBuilderProposer
=== RUN   TestSigAgg_DutyBuilderProposer/bellatrix_proposal
14:18:53.677 [35mDEBG [0m [32msigagg    [0m Threshold aggregated partial signatures
=== RUN   TestSigAgg_DutyBuilderProposer/capella_proposal
14:18:53.689 [35mDEBG [0m [32msigagg    [0m Threshold aggregated partial signatures
--- PASS: TestSigAgg_DutyBuilderProposer (0.03s)
    --- PASS: TestSigAgg_DutyBuilderProposer/bellatrix_proposal (0.01s)
    --- PASS: TestSigAgg_DutyBuilderProposer/capella_proposal (0.01s)
=== RUN   TestSigAgg_DutyBuilderRegistration
=== RUN   TestSigAgg_DutyBuilderRegistration/V1_registration
14:18:53.705 [35mDEBG [0m [32msigagg    [0m Threshold aggregated partial signatures
--- PASS: TestSigAgg_DutyBuilderRegistration (0.02s)
    --- PASS: TestSigAgg_DutyBuilderRegistration/V1_registration (0.01s)
PASS
coverage: 14.9% of statements
ok      github.com/obolnetwork/charon/core/sigagg   1.259s  coverage: 14.9% of statements
=== RUN   TestDuplicateAttData
--- PASS: TestDuplicateAttData (0.01s)
=== RUN   TestInclusion
14:18:53.319 [34mINFO [0m [32m          [0m Broadcasted block included on-chain     {"block_slot":
7591705477396844, "pubkey": "<invalid public key:>", "broadcast_delay": "0s"}
--- PASS: TestInclusion (0.00s)
=== RUN   TestStepString
--- PASS: TestStepString (0.00s)
=== RUN   TestTrackerFailedDuty
=== RUN   TestTrackerFailedDuty/FailAtConsensus
=== RUN   TestTrackerFailedDuty/Success
--- PASS: TestTrackerFailedDuty (0.00s)
    --- PASS: TestTrackerFailedDuty/FailAtConsensus (0.00s)
    --- PASS: TestTrackerFailedDuty/Success (0.00s)
=== RUN   TestAnalyseDutyFailed
=== RUN   TestAnalyseDutyFailed/Failed_at_fetcher
=== RUN   TestAnalyseDutyFailed/Failed_at_consensus
=== RUN   TestAnalyseDutyFailed/Failed_at_validatorAPI
=== RUN   TestAnalyseDutyFailed/Failed_at_parsigDBInternal
=== RUN   TestAnalyseDutyFailed/Failed_at_parsigEx
=== RUN   TestAnalyseDutyFailed/Failed_at_parsigDBInternal#01
=== RUN   TestAnalyseDutyFailed/Failed_at_parsigDBThreshold
=== RUN   TestAnalyseDutyFailed/Failed_at_bcast
=== RUN   TestAnalyseDutyFailed/Failed_at_chain_inclusion
=== RUN   TestAnalyseDutyFailed/FailedAtFetcherAsRandaoFailed
=== RUN   TestAnalyseDutyFailed/Attester_Duty_Success
=== RUN   TestAnalyseDutyFailed/SyncContrib_Duty_Success
--- PASS: TestAnalyseDutyFailed (0.00s)
```

```
    --- PASS: TestAnalyseDutyFailed/Failed_at_fetcher (0.00s)
    --- PASS: TestAnalyseDutyFailed/Failed_at_consensus (0.00s)
    --- PASS: TestAnalyseDutyFailed/Failed_at_validatorAPI (0.00s)
    --- PASS: TestAnalyseDutyFailed/Failed_at_parsigDBInternal (0.00s)
    --- PASS: TestAnalyseDutyFailed/Failed_at_parsigEx (0.00s)
    --- PASS: TestAnalyseDutyFailed/Failed_at_parsigDBInternal#01 (0.00s)
    --- PASS: TestAnalyseDutyFailed/Failed_at_parsigDBThreshold (0.00s)
    --- PASS: TestAnalyseDutyFailed/Failed_at_bcast (0.00s)
    --- PASS: TestAnalyseDutyFailed/Failed_at_chain_inclusion (0.00s)
    --- PASS: TestAnalyseDutyFailed/FailedAtFetcherAsRandaoFailed (0.00s)
    --- PASS: TestAnalyseDutyFailed/Attester_Duty_Success (0.00s)
    --- PASS: TestAnalyseDutyFailed/SyncContrib_Duty_Success (0.00s)
=== RUN   TestDutyFailedStep
=== RUN   TestDutyFailedStep/DutySuccess
=== RUN   TestDutyFailedStep/EmptyEvents
--- PASS: TestDutyFailedStep (0.00s)
    --- PASS: TestDutyFailedStep/DutySuccess (0.00s)
    --- PASS: TestDutyFailedStep/EmptyEvents (0.00s)
=== RUN   TestTrackerParticipation
--- PASS: TestTrackerParticipation (0.00s)
=== RUN   TestUnexpectedParticipation
=== RUN   TestUnexpectedParticipation/123/randao
14:18:53.323 [33mWARN [0m [32mtracker   [0m Parsig message root: signed message root not supported by
signature type {"duty": "123/randao"}
    core/signeddata.go:80 .MessageRoot
    core/tracker/tracker.go:442 .extractParSigs
    core/tracker/tracker.go:150 .Run
    core/tracker/tracker_internal_test.go:547 .func1
14:18:53.323 [33mWARN [0m [32mtracker   [0m Duty failed                                {"step":
"parsig_db_external", "reason": "insufficient partial signatures received, minimum required threshold not
reached", "reason_code": "par_sig_db_insufficient", "duty": "123/randao"}
=== RUN   TestUnexpectedParticipation/123/proposer
14:18:53.323 [33mWARN [0m [32mtracker   [0m Parsig message root: signed message root not supported by
signature type {"duty": "123/proposer"}
    core/signeddata.go:80 .MessageRoot
    core/tracker/tracker.go:442 .extractParSigs
    core/tracker/tracker.go:150 .Run
    core/tracker/tracker_internal_test.go:547 .func1
14:18:53.323 [33mWARN [0m [32mtracker   [0m Duty failed                                {"step":
"parsig_db_external", "reason": "insufficient partial signatures received, minimum required threshold not
reached", "reason_code": "par_sig_db_insufficient", "duty": "123/proposer"}
=== RUN   TestUnexpectedParticipation/123/attester
14:18:53.324 [33mWARN [0m [32mtracker   [0m Parsig message root: signed message root not supported by
signature type {"duty": "123/attester"}
    core/signeddata.go:80 .MessageRoot
    core/tracker/tracker.go:442 .extractParSigs
    core/tracker/tracker.go:150 .Run
    core/tracker/tracker_internal_test.go:547 .func1
14:18:53.324 [33mWARN [0m [32mtracker   [0m Duty failed                                {"step":
"parsig_db_external", "reason": "insufficient partial signatures received, minimum required threshold not
reached", "reason_code": "par_sig_db_insufficient", "duty": "123/attester"}
=== RUN   TestUnexpectedParticipation/123/builder_proposer
14:18:53.324 [33mWARN [0m [32mtracker   [0m Parsig message root: signed message root not supported by
signature type {"duty": "123/builder_proposer"}
    core/signeddata.go:80 .MessageRoot
    core/tracker/tracker.go:442 .extractParSigs
    core/tracker/tracker.go:150 .Run
    core/tracker/tracker_internal_test.go:547 .func1
14:18:53.324 [33mWARN [0m [32mtracker   [0m Duty failed                                {"step":
"parsig_db_external", "reason": "insufficient partial signatures received, minimum required threshold not
reached", "reason_code": "par_sig_db_insufficient", "duty": "123/builder_proposer"}
--- PASS: TestUnexpectedParticipation (0.00s)
    --- PASS: TestUnexpectedParticipation/123/randao (0.00s)
    --- PASS: TestUnexpectedParticipation/123/proposer (0.00s)
    --- PASS: TestUnexpectedParticipation/123/attester (0.00s)
    --- PASS: TestUnexpectedParticipation/123/builder_proposer (0.00s)
=== RUN   TestDutyRandaoUnexpected
14:18:53.324 [33mWARN [0m [32mtracker   [0m Duty failed: failed to query randao      {"step": "fetcher",
"reason": "couldn't propose block due to insufficient partial randao signatures", "reason_code":
"fetcher_proposer_few_randaos", "duty": "123/proposer"}
    core/tracker/tracker_internal_test.go:587 .func2
14:18:53.324 [33mWARN [0m [32mtracker   [0m Parsig message root: signed message root not supported by
```

```
signature type {"duty": "123/randao"}
    core/signeddata.go:80 .MessageRoot
    core/tracker/tracker.go:442 .extractParSigs
    core/tracker/tracker.go:150 .Run
    core/tracker/tracker_internal_test.go:596 .TestDutyRandaoUnexpected
14:18:53.324 [33mWARN [0m [32mtracker   [0m Duty failed                                {"step":
"parsig_db_external", "reason": "insufficient partial signatures received, minimum required threshold not
reached", "reason_code": "par_sig_db_insufficient", "duty": "123/randao"}
--- PASS: TestDutyRandaoUnexpected (0.00s)
=== RUN   TestDutyRandaoExpected
14:18:53.324 [33mWARN [0m [32mtracker   [0m Duty failed: failed to query randao      {"step": "fetcher",
"reason": "couldn't propose block due to insufficient partial randao signatures", "reason_code":
"fetcher_proposer_few_randaos", "duty": "123/proposer"}
    core/tracker/tracker_internal_test.go:635 .func2
14:18:53.324 [33mWARN [0m [32mtracker   [0m Parsig message root: signed message root not supported by
signature type {"duty": "123/randao"}
    core/signeddata.go:80 .MessageRoot
    core/tracker/tracker.go:442 .extractParSigs
    core/tracker/tracker.go:150 .Run
    core/tracker/tracker_internal_test.go:644 .TestDutyRandaoExpected
14:18:53.324 [33mWARN [0m [32mtracker   [0m Duty failed                                {"step":
"parsig_db_external", "reason": "insufficient partial signatures received, minimum required threshold not
reached", "reason_code": "par_sig_db_insufficient", "duty": "123/randao"}
--- PASS: TestDutyRandaoExpected (0.00s)
=== RUN   TestFromSlot
--- PASS: TestFromSlot (0.00s)
=== RUN   TestAnalyseFetcherFailed
=== RUN   TestAnalyseFetcherFailed/eth2_error
=== RUN   TestAnalyseFetcherFailed/beacon_committee_selections_endpoint_not_inclSupported
=== RUN   TestAnalyseFetcherFailed/no_external_DutyPrepareAggregator_signatures_received
=== RUN   TestAnalyseFetcherFailed/insufficient_DutyPrepareAggregator_signature
=== RUN   TestAnalyseFetcherFailed/DutyPrepareAggregator_failed
=== RUN   TestAnalyseFetcherFailed/DutyAttester_failed
=== RUN   TestAnalyseFetcherFailed/no_aggregator_found
=== RUN   TestAnalyseFetcherFailed/sync_committee_selections_endpoint_not_inclSupported
=== RUN   TestAnalyseFetcherFailed/no_external_DutyPrepareSyncContribution_signatures
=== RUN   TestAnalyseFetcherFailed/insufficient_DutyPrepareSyncContribution_signatures
=== RUN   TestAnalyseFetcherFailed/DutyPrepareSyncContribution_failed
=== RUN   TestAnalyseFetcherFailed/DutySyncMessage_failed
=== RUN   TestAnalyseFetcherFailed/no_sync_committee_aggregators_found
=== RUN   TestAnalyseFetcherFailed/unexpected_error
--- PASS: TestAnalyseFetcherFailed (0.00s)
    --- PASS: TestAnalyseFetcherFailed/eth2_error (0.00s)
    --- PASS: TestAnalyseFetcherFailed/beacon_committee_selections_endpoint_not_inclSupported (0.00s)
    --- PASS: TestAnalyseFetcherFailed/no_external_DutyPrepareAggregator_signatures_received (0.00s)
    --- PASS: TestAnalyseFetcherFailed/insufficient_DutyPrepareAggregator_signature (0.00s)
    --- PASS: TestAnalyseFetcherFailed/DutyPrepareAggregator_failed (0.00s)
    --- PASS: TestAnalyseFetcherFailed/DutyAttester_failed (0.00s)
    --- PASS: TestAnalyseFetcherFailed/no_aggregator_found (0.00s)
    --- PASS: TestAnalyseFetcherFailed/sync_committee_selections_endpoint_not_inclSupported (0.00s)
    --- PASS: TestAnalyseFetcherFailed/no_external_DutyPrepareSyncContribution_signatures (0.00s)
    --- PASS: TestAnalyseFetcherFailed/insufficient_DutyPrepareSyncContribution_signatures (0.00s)
    --- PASS: TestAnalyseFetcherFailed/DutyPrepareSyncContribution_failed (0.00s)
    --- PASS: TestAnalyseFetcherFailed/DutySyncMessage_failed (0.00s)
    --- PASS: TestAnalyseFetcherFailed/no_sync_committee_aggregators_found (0.00s)
    --- PASS: TestAnalyseFetcherFailed/unexpected_error (0.00s)
=== RUN   TestIsParSigEventExpected
=== RUN   TestIsParSigEventExpected/DutyExit
=== RUN   TestIsParSigEventExpected/DutyBuilderRegistration
=== RUN   TestIsParSigEventExpected/DutyRandao_expected
=== RUN   TestIsParSigEventExpected/DutyRandao_unexpected
=== RUN   TestIsParSigEventExpected/DutyPrepareAggregator_expected
=== RUN   TestIsParSigEventExpected/DutyPrepareAggregator_unexpected
=== RUN   TestIsParSigEventExpected/DutyPrepareSyncContribution_expected
=== RUN   TestIsParSigEventExpected/DutyPrepareSyncContribution_unexpected
=== RUN   TestIsParSigEventExpected/DutySyncMessage_unexpected
=== RUN   TestIsParSigEventExpected/DutySyncMessage_expected
--- PASS: TestIsParSigEventExpected (0.00s)
    --- PASS: TestIsParSigEventExpected/DutyExit (0.00s)
    --- PASS: TestIsParSigEventExpected/DutyBuilderRegistration (0.00s)
    --- PASS: TestIsParSigEventExpected/DutyRandao_expected (0.00s)
    --- PASS: TestIsParSigEventExpected/DutyRandao_unexpected (0.00s)
```

```
    --- PASS: TestIsParSigEventExpected/DutyPrepareAggregator_expected (0.00s)
    --- PASS: TestIsParSigEventExpected/DutyPrepareAggregator_unexpected (0.00s)
    --- PASS: TestIsParSigEventExpected/DutyPrepareSyncContribution_expected (0.00s)
    --- PASS: TestIsParSigEventExpected/DutyPrepareSyncContribution_unexpected (0.00s)
    --- PASS: TestIsParSigEventExpected/DutySyncMessage_unexpected (0.00s)
    --- PASS: TestIsParSigEventExpected/DutySyncMessage_expected (0.00s)
=== RUN   TestAnalyseParSigs
--- PASS: TestAnalyseParSigs (0.01s)
=== RUN   TestDutyFailedMultipleEvents
--- PASS: TestDutyFailedMultipleEvents (0.00s)
=== RUN   TestUnexpectedFailures
--- PASS: TestUnexpectedFailures (0.00s)
=== RUN   TestIgnoreUnsupported
=== RUN   TestIgnoreUnsupported/Attester_not_ignored
=== RUN   TestIgnoreUnsupported/Aggregator_failed_and_ignored
14:18:53.330 [33mWARN[0m [32m          [0m Ignoring attestation aggregation failures since VCs do not
seem to support beacon committee selection aggregation
=== RUN   TestIgnoreUnsupported/Aggregator_success
=== RUN   TestIgnoreUnsupported/Aggregator_failed_but_not_ignored
=== RUN   TestIgnoreUnsupported/SyncContrib_failed_and_ignored
14:18:53.330 [33mWARN[0m [32m          [0m Ignoring sync contribution failures since VCs do not seem to
support sync committee selection aggregation
=== RUN   TestIgnoreUnsupported/SyncContrib_success
=== RUN   TestIgnoreUnsupported/SyncContrib_failed_but_not_ignored
--- PASS: TestIgnoreUnsupported (0.00s)
    --- PASS: TestIgnoreUnsupported/Attester_not_ignored (0.00s)
    --- PASS: TestIgnoreUnsupported/Aggregator_failed_and_ignored (0.00s)
    --- PASS: TestIgnoreUnsupported/Aggregator_success (0.00s)
    --- PASS: TestIgnoreUnsupported/Aggregator_failed_but_not_ignored (0.00s)
    --- PASS: TestIgnoreUnsupported/SyncContrib_failed_and_ignored (0.00s)
    --- PASS: TestIgnoreUnsupported/SyncContrib_success (0.00s)
    --- PASS: TestIgnoreUnsupported/SyncContrib_failed_but_not_ignored (0.00s)
PASS
coverage: 37.5% of statements
ok      github.com/obolnetwork/charon/core/tracker  0.885s  coverage: 37.5% of statements
=== RUN   TestProxyShutdown
--- PASS: TestProxyShutdown (0.00s)
=== RUN   TestRouterIntegration
    router_internal_test.go:86: Skipping integration test since BEACON_URL not found
--- SKIP: TestRouterIntegration (0.00s)
=== RUN   TestRawRouter
=== RUN   TestRawRouter/proxy
=== RUN   TestRawRouter/invalid_path_param
14:18:53.884 [35mDEBG[0m [32mvapi      [0m Validator api 4xx response               {"status_code":
400, "message": "invalid uint path parameter epoch [not_a_number]", "error": "api
error[status=400,msg=invalid uint path parameter epoch [not_a_number]]: strconv.ParseUint: parsing
\"not_a_number\": invalid syntax", "duration": "59.75µs", "vapi_endpoint": "attester_duties"}
=== RUN   TestRawRouter/missing_query_params
14:18:53.895 [35mDEBG[0m [32mvapi      [0m Validator api 4xx response               {"status_code":
400, "message": "missing 0x-hex query parameter randao_reveal", "error": "api
error[status=400,msg=missing 0x-hex query parameter randao_reveal]: <nil>", "duration": "12.25µs",
"vapi_endpoint": "propose_block"}
=== RUN   TestRawRouter/invalid_length_query_params
14:18:53.901 [35mDEBG[0m [32mvapi      [0m Validator api 4xx response               {"status_code":
400, "message": "invalid length for 0x-hex query parameter randao_reveal, expect 96 bytes", "error": "api
error[status=400,msg=invalid length for 0x-hex query parameter randao_reveal, expect 96 bytes]: <nil>",
"duration": "7.209µs", "vapi_endpoint": "propose_block"}
=== RUN   TestRawRouter/empty_graffiti
=== RUN   TestRawRouter/empty_body
14:18:53.917 [35mDEBG[0m [32mvapi      [0m Validator api 4xx response               {"status_code":
400, "message": "empty request body", "error": "api error[status=400,msg=empty request body]: empty
request body", "duration": "111.375µs", "vapi_endpoint": "attester_duties"}
=== RUN   TestRawRouter/invalid_request_body
14:18:53.919 [35mDEBG[0m [32mvapi      [0m Validator api 4xx response               {"status_code":
400, "message": "failed parsing json request body", "error": "api error[status=400,msg=failed parsing
json request body]: invalid character 'o' in literal null (expecting 'u')", "duration": "7.458µs",
"vapi_endpoint": "attester_duties"}
=== RUN   TestRawRouter/valid_content_type_in_2xx_response
=== RUN   TestRawRouter/valid_content_type_in_non-2xx_response
14:18:53.922 [35mDEBG[0m [32mvapi      [0m Validator api 4xx response               {"status_code":
400, "message": "failed parsing json request body", "error": "api error[status=400,msg=failed parsing
json request body]: invalid character 'o' in literal null (expecting 'u')", "duration": "10.667µs",
```

```
"vapi_endpoint": "attester_duties"}
=== RUN   TestRawRouter/client_timeout
14:18:53.926 [35mDEBG[0m [32mvapi      [0m Validator api 4xx response               {"status_code":
408, "message": "client cancelled request", "error": "api error[status=408,msg=client cancelled request]:
context canceled", "duration": "69.083µs", "vapi_endpoint": "get_validator"}
=== RUN   TestRawRouter/get_single_validators
=== RUN   TestRawRouter/get_validators_with_post
=== RUN   TestRawRouter/get_validators_with_post/via_query_ids
=== RUN   TestRawRouter/get_validators_with_post/via_post_body
=== RUN   TestRawRouter/get_validators_with_post/empty_parameters
=== RUN   TestRawRouter/submit_bellatrix_ssz_proposal
=== RUN   TestRawRouter/submit_capella_ssz_beacon_block
=== RUN   TestRawRouter/submit_deneb_ssz_beacon_block
=== RUN   TestRawRouter/get_response_header_for_beacon_block_proposal
=== RUN   TestRawRouter/get_response_header_for_blinded_block_proposal
=== RUN   TestRawRouter/get_response_header_for_block_proposal_v3
--- PASS: TestRawRouter (0.09s)
    --- PASS: TestRawRouter/proxy (0.01s)
    --- PASS: TestRawRouter/invalid_path_param (0.00s)
    --- PASS: TestRawRouter/missing_query_params (0.01s)
    --- PASS: TestRawRouter/invalid_length_query_params (0.01s)
    --- PASS: TestRawRouter/empty_graffiti (0.00s)
    --- PASS: TestRawRouter/empty_body (0.01s)
    --- PASS: TestRawRouter/invalid_request_body (0.00s)
    --- PASS: TestRawRouter/valid_content_type_in_2xx_response (0.00s)
    --- PASS: TestRawRouter/valid_content_type_in_non-2xx_response (0.00s)
    --- PASS: TestRawRouter/client_timeout (0.00s)
    --- PASS: TestRawRouter/get_single_validators (0.00s)
    --- PASS: TestRawRouter/get_validators_with_post (0.01s)
        --- PASS: TestRawRouter/get_validators_with_post/via_query_ids (0.00s)
        --- PASS: TestRawRouter/get_validators_with_post/via_post_body (0.00s)
        --- PASS: TestRawRouter/get_validators_with_post/empty_parameters (0.00s)
    --- PASS: TestRawRouter/submit_bellatrix_ssz_proposal (0.00s)
    --- PASS: TestRawRouter/submit_capella_ssz_beacon_block (0.00s)
    --- PASS: TestRawRouter/submit_deneb_ssz_beacon_block (0.00s)
    --- PASS: TestRawRouter/get_response_header_for_beacon_block_proposal (0.00s)
    --- PASS: TestRawRouter/get_response_header_for_blinded_block_proposal (0.01s)
    --- PASS: TestRawRouter/get_response_header_for_block_proposal_v3 (0.01s)
=== RUN   TestRouter
=== RUN   TestRouter/wrong_http_method
=== RUN   TestRouter/attesterduty
=== RUN   TestRouter/proposerduty
=== RUN   TestRouter/synccommduty
=== RUN   TestRouter/get_validator_index
=== RUN   TestRouter/get_validator_pubkey
=== RUN   TestRouter/empty_validators
=== RUN   TestRouter/get_validators_with_no_validator_ids_provided
=== RUN   TestRouter/empty_attester_duties
=== RUN   TestRouter/empty_synccomm_duties
=== RUN   TestRouter/empty_proposer_duties
=== RUN   TestRouter/attestation_data
=== RUN   TestRouter/submit_randao
14:18:54.080 [31mERRO[0m [32mvapi      [0m Validator api 5xx response: not implemented {"status_code":
500, "message": "Internal server error", "duration": "56.334µs", "vapi_endpoint": "propose_block"}
    core/validatorapi/router_internal_test.go:1072 .1
    core/validatorapi/router_internal_test.go:1647 .Proposal
    core/validatorapi/router.go:705 .func8
    core/validatorapi/router.go:321 .func1
=== RUN   TestRouter/submit_randao_blinded_block
14:18:54.085 [31mERRO[0m [32mvapi      [0m Validator api 5xx response: not implemented {"status_code":
500, "message": "Internal server error", "duration": "24.25µs", "vapi_endpoint": "propose_blinded_block"}
    core/validatorapi/router_internal_test.go:1097 .1
    core/validatorapi/router_internal_test.go:1655 .BlindedProposal
    core/validatorapi/router.go:734 .func12
    core/validatorapi/router.go:321 .func1
=== RUN   TestRouter/submit_block_phase0
=== RUN   TestRouter/submit_block_altair
=== RUN   TestRouter/submit_block_bellatrix
=== RUN   TestRouter/submit_block_capella
=== RUN   TestRouter/submit_blinded_block_bellatrix
=== RUN   TestRouter/submit_blinded_block_capella
=== RUN   TestRouter/submit_validator_registration
```

```
=== RUN   TestRouter/submit_voluntary_exit
=== RUN   TestRouter/sync_committee_contribution
=== RUN   TestRouter/submit_sync_committee_messages
=== RUN   TestRouter/aggregate_sync_committee_selections
=== RUN   TestRouter/node_version
--- PASS: TestRouter (0.20s)
    --- PASS: TestRouter/wrong_http_method (0.01s)
    --- PASS: TestRouter/attesterduty (0.02s)
    --- PASS: TestRouter/proposerduty (0.01s)
    --- PASS: TestRouter/synccommduty (0.00s)
    --- PASS: TestRouter/get_validator_index (0.01s)
    --- PASS: TestRouter/get_validator_pubkey (0.00s)
    --- PASS: TestRouter/empty_validators (0.00s)
    --- PASS: TestRouter/get_validators_with_no_validator_ids_provided (0.04s)
    --- PASS: TestRouter/empty_attester_duties (0.00s)
    --- PASS: TestRouter/empty_synccomm_duties (0.01s)
    --- PASS: TestRouter/empty_proposer_duties (0.01s)
    --- PASS: TestRouter/attestation_data (0.00s)
    --- PASS: TestRouter/submit_randao (0.00s)
    --- PASS: TestRouter/submit_randao_blinded_block (0.00s)
    --- PASS: TestRouter/submit_block_phase0 (0.01s)
    --- PASS: TestRouter/submit_block_altair (0.01s)
    --- PASS: TestRouter/submit_block_bellatrix (0.01s)
    --- PASS: TestRouter/submit_block_capella (0.01s)
    --- PASS: TestRouter/submit_blinded_block_bellatrix (0.01s)
    --- PASS: TestRouter/submit_blinded_block_capella (0.00s)
    --- PASS: TestRouter/submit_validator_registration (0.01s)
    --- PASS: TestRouter/submit_voluntary_exit (0.00s)
    --- PASS: TestRouter/sync_committee_contribution (0.00s)
    --- PASS: TestRouter/submit_sync_committee_messages (0.00s)
    --- PASS: TestRouter/aggregate_sync_committee_selections (0.00s)
    --- PASS: TestRouter/node_version (0.00s)
=== RUN   TestBeaconCommitteeSelections
--- PASS: TestBeaconCommitteeSelections (0.01s)
=== RUN   TestSubmitAggregateAttestations
--- PASS: TestSubmitAggregateAttestations (0.01s)
=== RUN   TestGetExecutionOptimisticFromMetadata
=== RUN   TestGetExecutionOptimisticFromMetadata/missing_execution_optimistic
=== RUN   TestGetExecutionOptimisticFromMetadata/wrong_type
=== RUN   TestGetExecutionOptimisticFromMetadata/valid_value
--- PASS: TestGetExecutionOptimisticFromMetadata (0.00s)
    --- PASS: TestGetExecutionOptimisticFromMetadata/missing_execution_optimistic (0.00s)
    --- PASS: TestGetExecutionOptimisticFromMetadata/wrong_type (0.00s)
    --- PASS: TestGetExecutionOptimisticFromMetadata/valid_value (0.00s)
=== RUN   TestGetDependentRootFromMetadata
=== RUN   TestGetDependentRootFromMetadata/missing_dependent_root
=== RUN   TestGetDependentRootFromMetadata/wrong_type
=== RUN   TestGetDependentRootFromMetadata/valid_value
--- PASS: TestGetDependentRootFromMetadata (0.00s)
    --- PASS: TestGetDependentRootFromMetadata/missing_dependent_root (0.00s)
    --- PASS: TestGetDependentRootFromMetadata/wrong_type (0.00s)
    --- PASS: TestGetDependentRootFromMetadata/valid_value (0.00s)
=== RUN   TestMismatchKeysFunc
=== RUN   TestMismatchKeysFunc/no_mismatch
=== RUN   TestMismatchKeysFunc/mismatch
=== RUN   TestMismatchKeysFunc/unknown_public_key
--- PASS: TestMismatchKeysFunc (0.00s)
    --- PASS: TestMismatchKeysFunc/no_mismatch (0.00s)
    --- PASS: TestMismatchKeysFunc/mismatch (0.00s)
    --- PASS: TestMismatchKeysFunc/unknown_public_key (0.00s)
=== RUN   TestWrapResponse
--- PASS: TestWrapResponse (0.00s)
=== RUN   TestWrapResponseWithMetadata
--- PASS: TestWrapResponseWithMetadata (0.00s)
=== RUN   TestComponent_ValidSubmitAttestations
--- PASS: TestComponent_ValidSubmitAttestations (0.01s)
=== RUN   TestComponent_InvalidSubmitAttestations
--- PASS: TestComponent_InvalidSubmitAttestations (0.00s)
=== RUN   TestSubmitAttestations_Verify
14:18:54.187 [35mDEBG [0m [32m          [0m Set attester duties                      {"slot": "16"}
14:18:54.187 [34mINFO [0m [32m          [0m Mock beacon committee subscription submitted {"aggregators":
1}
```

```
--- PASS: TestSubmitAttestations_Verify (0.01s)
=== RUN   TestSignAndVerify
--- PASS: TestSignAndVerify (0.01s)
=== RUN   TestComponent_Proposal
--- PASS: TestComponent_Proposal (0.00s)
=== RUN   TestComponent_SubmitProposal
14:18:54.207 [35mDEBG[0m [32m          [0m Beacon proposal submitted by validator client
{"block_version": "phase0", "duty": "123/proposer"}
--- PASS: TestComponent_SubmitProposal (0.01s)
=== RUN   TestComponent_SubmitProposalInvalidSignature
--- PASS: TestComponent_SubmitProposalInvalidSignature (0.01s)
=== RUN   TestComponent_SubmitProposalInvalidBlock
=== RUN   TestComponent_SubmitProposalInvalidBlock/no_phase_0_block
=== RUN   TestComponent_SubmitProposalInvalidBlock/no_altair_block
=== RUN   TestComponent_SubmitProposalInvalidBlock/no_bellatrix_block
=== RUN   TestComponent_SubmitProposalInvalidBlock/no_capella_block
=== RUN   TestComponent_SubmitProposalInvalidBlock/no_deneb_block
=== RUN   TestComponent_SubmitProposalInvalidBlock/none
=== RUN   TestComponent_SubmitProposalInvalidBlock/no_phase_0_sig
=== RUN   TestComponent_SubmitProposalInvalidBlock/no_altair_sig
=== RUN   TestComponent_SubmitProposalInvalidBlock/no_bellatrix_sig
--- PASS: TestComponent_SubmitProposalInvalidBlock (0.01s)
    --- PASS: TestComponent_SubmitProposalInvalidBlock/no_phase_0_block (0.00s)
    --- PASS: TestComponent_SubmitProposalInvalidBlock/no_altair_block (0.00s)
    --- PASS: TestComponent_SubmitProposalInvalidBlock/no_bellatrix_block (0.00s)
    --- PASS: TestComponent_SubmitProposalInvalidBlock/no_capella_block (0.00s)
    --- PASS: TestComponent_SubmitProposalInvalidBlock/no_deneb_block (0.00s)
    --- PASS: TestComponent_SubmitProposalInvalidBlock/none (0.00s)
    --- PASS: TestComponent_SubmitProposalInvalidBlock/no_phase_0_sig (0.00s)
    --- PASS: TestComponent_SubmitProposalInvalidBlock/no_altair_sig (0.00s)
    --- PASS: TestComponent_SubmitProposalInvalidBlock/no_bellatrix_sig (0.00s)
=== RUN   TestComponent_BlindedProposal
--- PASS: TestComponent_BlindedProposal (0.02s)
=== RUN   TestComponent_SubmitBlindedProposal
14:18:54.260 [35mDEBG[0m [32m          [0m Blinded beacon block submitted by validator client {"duty":
"123/builder_proposer"}
--- PASS: TestComponent_SubmitBlindedProposal (0.01s)
=== RUN   TestComponent_SubmitBlindedProposalInvalidSignature
--- PASS: TestComponent_SubmitBlindedProposalInvalidSignature (0.01s)
=== RUN   TestComponent_SubmitBlindedProposalInvalidBlock
=== RUN   TestComponent_SubmitBlindedProposalInvalidBlock/no_bellatrix_block
=== RUN   TestComponent_SubmitBlindedProposalInvalidBlock/no_deneb_block
=== RUN   TestComponent_SubmitBlindedProposalInvalidBlock/none
=== RUN   TestComponent_SubmitBlindedProposalInvalidBlock/no_bellatrix_sig
=== RUN   TestComponent_SubmitBlindedProposalInvalidBlock/no_capella_sig
=== RUN   TestComponent_SubmitBlindedProposalInvalidBlock/no_deneb_sig
--- PASS: TestComponent_SubmitBlindedProposalInvalidBlock (0.00s)
    --- PASS: TestComponent_SubmitBlindedProposalInvalidBlock/no_bellatrix_block (0.00s)
    --- PASS: TestComponent_SubmitBlindedProposalInvalidBlock/no_deneb_block (0.00s)
    --- PASS: TestComponent_SubmitBlindedProposalInvalidBlock/none (0.00s)
    --- PASS: TestComponent_SubmitBlindedProposalInvalidBlock/no_bellatrix_sig (0.00s)
    --- PASS: TestComponent_SubmitBlindedProposalInvalidBlock/no_capella_sig (0.00s)
    --- PASS: TestComponent_SubmitBlindedProposalInvalidBlock/no_deneb_sig (0.00s)
=== RUN   TestComponent_SubmitVoluntaryExit
14:18:54.277 [34mINFO[0m [32m          [0m Voluntary exit submitted by validator client {"duty":
"160/exit"}
--- PASS: TestComponent_SubmitVoluntaryExit (0.00s)
=== RUN   TestComponent_SubmitVoluntaryExitInvalidSignature
--- PASS: TestComponent_SubmitVoluntaryExitInvalidSignature (0.00s)
=== RUN   TestComponent_Duties
=== RUN   TestComponent_Duties/proposer_duties
=== RUN   TestComponent_Duties/attester_duties
=== RUN   TestComponent_Duties/sync_committee_duties
--- PASS: TestComponent_Duties (0.00s)
    --- PASS: TestComponent_Duties/proposer_duties (0.00s)
    --- PASS: TestComponent_Duties/attester_duties (0.00s)
    --- PASS: TestComponent_Duties/sync_committee_duties (0.00s)
=== RUN   TestComponent_SubmitValidatorRegistration
14:18:54.291 [35mDEBG[0m [32m          [0m Swallowing non-dv registration, this is a known limitation
for many validator clients {"pubkey": "441_bed"}
--- PASS: TestComponent_SubmitValidatorRegistration (0.01s)
=== RUN   TestComponent_SubmitValidatorRegistrationInvalidSignature
```

```
--- PASS: TestComponent_SubmitValidatorRegistrationInvalidSignature (0.02s)
=== RUN   TestComponent_TekuProposerConfig
--- PASS: TestComponent_TekuProposerConfig (0.00s)
=== RUN   TestComponent_AggregateBeaconCommitteeSelections
--- PASS: TestComponent_AggregateBeaconCommitteeSelections (0.00s)
=== RUN   TestComponent_SubmitAggregateAttestations
--- PASS: TestComponent_SubmitAggregateAttestations (0.01s)
=== RUN   TestComponent_SubmitAggregateAttestationVerify
--- PASS: TestComponent_SubmitAggregateAttestationVerify (0.03s)
=== RUN   TestComponent_SubmitSyncCommitteeMessages
--- PASS: TestComponent_SubmitSyncCommitteeMessages (0.01s)
=== RUN   TestComponent_SubmitSyncCommitteeContributions
--- PASS: TestComponent_SubmitSyncCommitteeContributions (0.00s)
=== RUN   TestComponent_SubmitSyncCommitteeContributionsVerify
--- PASS: TestComponent_SubmitSyncCommitteeContributionsVerify (0.01s)
=== RUN   TestComponent_GetAllValidators
--- PASS: TestComponent_GetAllValidators (0.02s)
=== RUN   TestComponent_GetClusterValidatorsWithError
--- PASS: TestComponent_GetClusterValidatorsWithError (0.01s)
=== RUN   TestComponent_AggregateSyncCommitteeSelectionsVerify
--- PASS: TestComponent_AggregateSyncCommitteeSelectionsVerify (0.01s)
PASS
coverage: 53.5% of statements
ok      github.com/obolnetwork/charon/core/validatorapi 1.928s  coverage: 53.5% of statements
=== RUN   TestLoadDefinition
=== RUN   TestLoadDefinition/Load_valid_definition
14:18:54.248 [34mINFO [0m [32m          [0m Cluster definition loaded from disk      {"path":
"/var/folders/h1/f0qvvxw53c72tk0z4_fgyms00000gn/T/TestLoadDefinition2440734111/001/valid-cluster-
definition.json", "definition_hash":
"0x82194b2bc881ea2d3ea852f084c9a923722a540622ee24f555b1579a9184d1fd"}
=== RUN   TestLoadDefinition/Definition_file_doesn't_exist
=== RUN   TestLoadDefinition/Load_invalid_definition
=== RUN   TestLoadDefinition/Load_invalid_definition_with_no_verify
14:18:54.251 [34mINFO [0m [32m          [0m Cluster definition loaded from disk      {"path":
"/var/folders/h1/f0qvvxw53c72tk0z4_fgyms00000gn/T/TestLoadDefinition2440734111/001/invalid-cluster-
definition2.json", "definition_hash": ""}
14:18:54.251 [33mWARN [0m [32m          [0m Ignoring failed cluster definition hashes verification due
to --no-verify flag: invalid config hash
    cluster/definition.go:454 .VerifyHashes
    dkg/disk.go:68 .loadDefinition
    dkg/disk_internal_test.go:103 .func2
14:18:54.251 [33mWARN [0m [32m          [0m Ignoring failed cluster definition signature verification
due to --no-verify flag: invalid operator config signature {"operator_address":
"0x1a642f0E3c3aF545E7AcBD38b07251B3990914F1"}
    cluster/definition.go:223 .VerifySignatures
    dkg/disk.go:74 .loadDefinition
    dkg/disk_internal_test.go:103 .func2
=== RUN   TestLoadDefinition/Load_invalid_definition_without_no_verify
14:18:54.251 [34mINFO [0m [32m          [0m Cluster definition loaded from disk      {"path":
"/var/folders/h1/f0qvvxw53c72tk0z4_fgyms00000gn/T/TestLoadDefinition2440734111/001/invalid-cluster-
definition2.json", "definition_hash": ""}
--- PASS: TestLoadDefinition (0.04s)
    --- PASS: TestLoadDefinition/Load_valid_definition (0.00s)
    --- PASS: TestLoadDefinition/Definition_file_doesn't_exist (0.00s)
    --- PASS: TestLoadDefinition/Load_invalid_definition (0.00s)
    --- PASS: TestLoadDefinition/Load_invalid_definition_with_no_verify (0.00s)
    --- PASS: TestLoadDefinition/Load_invalid_definition_without_no_verify (0.00s)
=== RUN   TestCheckClearDataDir
=== RUN   TestCheckClearDataDir/dataDir_doesn't_exist
=== RUN   TestCheckClearDataDir/dataDir_exists_and_is_a_file
=== RUN   TestCheckClearDataDir/dataDir_contains_validator_keys_file
=== RUN   TestCheckClearDataDir/dataDir_contains_validator_keys_directory
=== RUN   TestCheckClearDataDir/dataDir_contains_cluster-lock.json_file
=== RUN   TestCheckClearDataDir/dataDir_contains_deposit-data-32eth.json_file
=== RUN   TestCheckClearDataDir/dataDir_is_clean_and_does_not_contains_charon-enr-private-key_file
=== RUN   TestCheckClearDataDir/dataDir_is_clean_and_contains_charon-enr-private-key_file
--- PASS: TestCheckClearDataDir (0.01s)
    --- PASS: TestCheckClearDataDir/dataDir_doesn't_exist (0.00s)
    --- PASS: TestCheckClearDataDir/dataDir_exists_and_is_a_file (0.00s)
    --- PASS: TestCheckClearDataDir/dataDir_contains_validator_keys_file (0.00s)
    --- PASS: TestCheckClearDataDir/dataDir_contains_validator_keys_directory (0.00s)
    --- PASS: TestCheckClearDataDir/dataDir_contains_cluster-lock.json_file (0.00s)
```

```
    --- PASS: TestCheckClearDataDir/dataDir_contains_deposit-data-32eth.json_file (0.00s)
    --- PASS: TestCheckClearDataDir/dataDir_is_clean_and_does_not_contains_charon-enr-private-key_file
(0.00s)
    --- PASS: TestCheckClearDataDir/dataDir_is_clean_and_contains_charon-enr-private-key_file (0.00s)
=== RUN   TestInvalidSignatures
--- PASS: TestInvalidSignatures (0.01s)
=== RUN   TestValidSignatures
--- PASS: TestValidSignatures (0.02s)
=== RUN   TestValidateKeymanagerFlags
=== RUN   TestValidateKeymanagerFlags/Both_keymanager_flags_provided
=== RUN   TestValidateKeymanagerFlags/Address_provided_but_auth_token_absent
=== RUN   TestValidateKeymanagerFlags/Auth_token_provided_by_address_absent
=== RUN   TestValidateKeymanagerFlags/Malformed_address_provided
--- PASS: TestValidateKeymanagerFlags (0.00s)
    --- PASS: TestValidateKeymanagerFlags/Both_keymanager_flags_provided (0.00s)
    --- PASS: TestValidateKeymanagerFlags/Address_provided_but_auth_token_absent (0.00s)
    --- PASS: TestValidateKeymanagerFlags/Auth_token_provided_by_address_absent (0.00s)
    --- PASS: TestValidateKeymanagerFlags/Malformed_address_provided (0.00s)
=== RUN   TestExchanger
--- PASS: TestExchanger (0.07s)
=== RUN   TestFrostDKG
14:18:54.372 [35mDEBG[0m [32m          [0m Sending round 1 messages
14:18:54.372 [35mDEBG[0m [32m          [0m Sending round 1 messages
14:18:54.375 [35mDEBG[0m [32m          [0m Sending round 1 messages
14:18:54.375 [35mDEBG[0m [32m          [0m Received round 1 results
14:18:54.376 [35mDEBG[0m [32m          [0m Received round 1 results
14:18:54.376 [35mDEBG[0m [32m          [0m Received round 1 results
14:18:54.384 [35mDEBG[0m [32m          [0m Sending round 2 messages
14:18:54.385 [35mDEBG[0m [32m          [0m Sending round 2 messages
14:18:54.385 [35mDEBG[0m [32m          [0m Sending round 2 messages
14:18:54.385 [35mDEBG[0m [32m          [0m Received round 2 results
14:18:54.390 [35mDEBG[0m [32m          [0m Received round 2 results
14:18:54.390 [35mDEBG[0m [32m          [0m Received round 2 results
--- PASS: TestFrostDKG (0.02s)
=== RUN   TestBcastCallback
=== RUN   TestBcastCallback/invalid_round_1_sourceID
=== RUN   TestBcastCallback/invalid_round_1_cast_target_ID
=== RUN   TestBcastCallback/invalid_round_1_cast_validator_index
=== RUN   TestBcastCallback/invalid_round_1_commitments
=== RUN   TestBcastCallback/invalid_round_2_cast_source_ID
=== RUN   TestBcastCallback/invalid_round_2_cast_target_ID
=== RUN   TestBcastCallback/invalid_round_2_cast_validator_index
=== RUN   TestBcastCallback/invalid_cast_round
=== RUN   TestBcastCallback/invalid_round_1_casts_message
=== RUN   TestBcastCallback/invalid_round_2_casts_message
--- PASS: TestBcastCallback (0.04s)
    --- PASS: TestBcastCallback/invalid_round_1_sourceID (0.00s)
    --- PASS: TestBcastCallback/invalid_round_1_cast_target_ID (0.00s)
    --- PASS: TestBcastCallback/invalid_round_1_cast_validator_index (0.00s)
    --- PASS: TestBcastCallback/invalid_round_1_commitments (0.00s)
    --- PASS: TestBcastCallback/invalid_round_2_cast_source_ID (0.00s)
    --- PASS: TestBcastCallback/invalid_round_2_cast_target_ID (0.00s)
    --- PASS: TestBcastCallback/invalid_round_2_cast_validator_index (0.00s)
    --- PASS: TestBcastCallback/invalid_cast_round (0.00s)
    --- PASS: TestBcastCallback/invalid_round_1_casts_message (0.00s)
    --- PASS: TestBcastCallback/invalid_round_2_casts_message (0.00s)
=== RUN   TestP2PCallback
=== RUN   TestP2PCallback/invalid_round_1_sourceID
=== RUN   TestP2PCallback/invalid_round_1_targetID
=== RUN   TestP2PCallback/invalid_round_1_validator_index
=== RUN   TestP2PCallback/invalid_p2p_message
--- PASS: TestP2PCallback (0.02s)
    --- PASS: TestP2PCallback/invalid_round_1_sourceID (0.00s)
    --- PASS: TestP2PCallback/invalid_round_1_targetID (0.00s)
    --- PASS: TestP2PCallback/invalid_round_1_validator_index (0.00s)
    --- PASS: TestP2PCallback/invalid_p2p_message (0.00s)
=== RUN   TestSigsExchange
14:18:54.503 [35mDEBG[0m [32m          [0m Exchanging node signatures
14:18:54.503 [35mDEBG[0m [32m          [0m Exchanging node signatures
14:18:54.503 [35mDEBG[0m [32m          [0m Exchanging node signatures
14:18:54.503 [35mDEBG[0m [32m          [0m Exchanging node signatures
14:18:54.503 [35mDEBG[0m [32m          [0m Exchanging node signatures
```

```
14:18:54.503 [35mDEBG[0m [32m          [0m Exchanging node signatures
14:18:54.503 [35mDEBG[0m [32m          [0m Exchanging node signatures
14:18:54.503 [35mDEBG[0m [32m          [0m Exchanging node signatures
14:18:54.503 [35mDEBG[0m [32m          [0m Exchanging node signatures
14:18:54.503 [35mDEBG[0m [32m          [0m Exchanging node signatures
--- PASS: TestSigsExchange (0.24s)
=== RUN   TestSigsCallbacks
=== RUN   TestSigsCallbacks/wrong_peer_index,_equal_to_ours
=== RUN   TestSigsCallbacks/wrong_peer_index,_more_than_node_operators_amount
=== RUN   TestSigsCallbacks/wrong_peer_index,_peer_index_is_exactly_len(peers)
=== RUN   TestSigsCallbacks/invalid_message_type
=== RUN   TestSigsCallbacks/signature_verification_failed
=== RUN   TestSigsCallbacks/malformed_signature
=== RUN   TestSigsCallbacks/ok
--- PASS: TestSigsCallbacks (0.06s)
    --- PASS: TestSigsCallbacks/wrong_peer_index,_equal_to_ours (0.00s)
    --- PASS: TestSigsCallbacks/wrong_peer_index,_more_than_node_operators_amount (0.00s)
    --- PASS: TestSigsCallbacks/wrong_peer_index,_peer_index_is_exactly_len(peers) (0.00s)
    --- PASS: TestSigsCallbacks/invalid_message_type (0.00s)
    --- PASS: TestSigsCallbacks/signature_verification_failed (0.00s)
    --- PASS: TestSigsCallbacks/malformed_signature (0.00s)
    --- PASS: TestSigsCallbacks/ok (0.00s)
=== RUN   TestDKG
=== RUN   TestDKG/frost_v16
=== RUN   TestDKG/frost_latest
=== RUN   TestDKG/with_partial_deposits
=== RUN   TestDKG/dkg_with_keymanager
=== RUN   TestDKG/dkg_with_lockfile_publish
--- PASS: TestDKG (16.13s)
    --- PASS: TestDKG/frost_v16 (3.20s)
    --- PASS: TestDKG/frost_latest (3.14s)
    --- PASS: TestDKG/with_partial_deposits (3.34s)
    --- PASS: TestDKG/dkg_with_keymanager (3.22s)
    --- PASS: TestDKG/dkg_with_lockfile_publish (3.23s)
=== RUN   TestSyncFlow
=== RUN   TestSyncFlow/three_connect_one_disconnect
=== RUN   TestSyncFlow/four_connect_two_disconnect
--- PASS: TestSyncFlow (9.85s)
    --- PASS: TestSyncFlow/three_connect_one_disconnect (4.86s)
    --- PASS: TestSyncFlow/four_connect_two_disconnect (4.99s)
PASS
coverage: 53.2% of statements
ok      github.com/obolnetwork/charon/dkg   27.652s coverage: 53.2% of statements
=== RUN   TestBCast
14:18:55.361 [31mERRO[0m [32mbcast     [0m LibP2P handle stream error: dedup: duplicate ID, mismatching
hash {"duration": "101.75µs", "peer": "victorious-sports", "protocol": "/charon/dkg/bcast/1.0.0/sig"}
    dkg/bcast/server.go:97 .dedupHash
    dkg/bcast/server.go:126 .handleSigRequest
    p2p/receive.go:92 .func2
14:18:55.361 [31mERRO[0m [32mbcast     [0m LibP2P handle stream error: dedup: duplicate ID, mismatching
hash {"duration": "75.458µs", "peer": "victorious-sports", "protocol": "/charon/dkg/bcast/1.0.0/sig"}
    dkg/bcast/server.go:97 .dedupHash
    dkg/bcast/server.go:126 .handleSigRequest
    p2p/receive.go:92 .func2
--- PASS: TestBCast (0.04s)
PASS
coverage: 21.0% of statements
ok      github.com/obolnetwork/charon/dkg/bcast 0.383s  coverage: 21.0% of statements
=== RUN   TestUpdateStep
=== RUN   TestUpdateStep/wrong_initial_step
=== RUN   TestUpdateStep/valid_peer_step_update
=== RUN   TestUpdateStep/peer_step_is_behind
=== RUN   TestUpdateStep/peer_step_is_ahead
--- PASS: TestUpdateStep (0.00s)
    --- PASS: TestUpdateStep/wrong_initial_step (0.00s)
    --- PASS: TestUpdateStep/valid_peer_step_update (0.00s)
    --- PASS: TestUpdateStep/peer_step_is_behind (0.00s)
    --- PASS: TestUpdateStep/peer_step_is_ahead (0.00s)
=== RUN   TestSyncProtocol
=== RUN   TestSyncProtocol/2
    sync_test.go:31: server.AwaitAllConnected
14:18:55.673 [34mINFO[0m [32mserver0   [0m Connected to peer 1 of 1                {"peer": "excited-
```

```
jewelry"}
14:18:55.673 [34mINFO [0m [32mserver1    [0m Connected to peer 1 of 1                {"peer": "real-
oil"}
    sync_test.go:31: client.IsConnected
    sync_test.go:31: client.Shutdown
    sync_test.go:31: server.AwaitAllShutdown
=== RUN   TestSyncProtocol/3
    sync_test.go:35: server.AwaitAllConnected
14:18:56.221 [34mINFO [0m [32mserver1    [0m Connected to peer 1 of 2                {"peer": "real-
oil"}
14:18:56.223 [34mINFO [0m [32mserver0    [0m Connected to peer 1 of 2                {"peer": "excited-
jewelry"}
14:18:56.223 [34mINFO [0m [32mserver2    [0m Connected to peer 1 of 2                {"peer": "real-
oil"}
14:18:56.226 [34mINFO [0m [32mserver1    [0m Connected to peer 2 of 2                {"peer":
"ravishing-state"}
14:18:56.226 [34mINFO [0m [32mserver2    [0m Connected to peer 2 of 2                {"peer": "excited-
jewelry"}
14:18:56.226 [34mINFO [0m [32mserver0    [0m Connected to peer 2 of 2                {"peer":
"ravishing-state"}
    sync_test.go:35: client.IsConnected
    sync_test.go:35: client.Shutdown
    sync_test.go:35: server.AwaitAllShutdown
=== RUN   TestSyncProtocol/5
    sync_test.go:39: server.AwaitAllConnected
14:18:56.810 [34mINFO [0m [32mserver1    [0m Connected to peer 1 of 4                {"peer": "real-
oil"}
14:18:56.814 [34mINFO [0m [32mserver2    [0m Connected to peer 1 of 4                {"peer": "real-
oil"}
14:18:56.816 [34mINFO [0m [32mserver3    [0m Connected to peer 1 of 4                {"peer": "real-
oil"}
14:18:56.823 [34mINFO [0m [32mserver0    [0m Connected to peer 1 of 4                {"peer": "excited-
jewelry"}
14:18:56.823 [34mINFO [0m [32mserver4    [0m Connected to peer 1 of 4                {"peer": "real-
oil"}
14:18:56.825 [34mINFO [0m [32mserver2    [0m Connected to peer 2 of 4                {"peer": "excited-
jewelry"}
14:18:56.831 [34mINFO [0m [32mserver3    [0m Connected to peer 2 of 4                {"peer": "excited-
jewelry"}
14:18:56.831 [34mINFO [0m [32mserver1    [0m Connected to peer 2 of 4                {"peer":
"ravishing-state"}
14:18:56.831 [34mINFO [0m [32mserver0    [0m Connected to peer 2 of 4                {"peer":
"ravishing-state"}
14:18:56.832 [34mINFO [0m [32mserver4    [0m Connected to peer 2 of 4                {"peer": "excited-
jewelry"}
14:18:56.834 [34mINFO [0m [32mserver3    [0m Connected to peer 3 of 4                {"peer":
"ravishing-state"}
14:18:56.838 [34mINFO [0m [32mserver2    [0m Connected to peer 3 of 4                {"peer": "blushing-
father"}
14:18:56.838 [34mINFO [0m [32mserver1    [0m Connected to peer 3 of 4                {"peer": "blushing-
father"}
14:18:56.838 [34mINFO [0m [32mserver4    [0m Connected to peer 3 of 4                {"peer":
"ravishing-state"}
14:18:56.839 [34mINFO [0m [32mserver0    [0m Connected to peer 3 of 4                {"peer": "blushing-
father"}
14:18:56.841 [34mINFO [0m [32mserver3    [0m Connected to peer 4 of 4                {"peer": "cautious-
women"}
14:18:56.841 [34mINFO [0m [32mserver0    [0m Connected to peer 4 of 4                {"peer": "cautious-
women"}
14:18:56.841 [34mINFO [0m [32mserver1    [0m Connected to peer 4 of 4                {"peer": "cautious-
women"}
14:18:56.842 [34mINFO [0m [32mserver4    [0m Connected to peer 4 of 4                {"peer": "blushing-
father"}
14:18:56.842 [34mINFO [0m [32mserver2    [0m Connected to peer 4 of 4                {"peer": "cautious-
women"}
    sync_test.go:39: client.IsConnected
    sync_test.go:39: client.Shutdown
    sync_test.go:39: server.AwaitAllShutdown
=== RUN   TestSyncProtocol/invalid_version
    sync_test.go:43: server.AwaitAllConnected
--- PASS: TestSyncProtocol (2.02s)
    --- PASS: TestSyncProtocol/2 (0.55s)
```

```
    --- PASS: TestSyncProtocol/3 (0.58s)
    --- PASS: TestSyncProtocol/5 (0.78s)
    --- PASS: TestSyncProtocol/invalid_version (0.11s)
PASS
coverage: 24.9% of statements
ok      github.com/obolnetwork/charon/dkg/sync  2.561s  coverage: 24.9% of statements
=== RUN   TestSlotHashRoot
--- PASS: TestSlotHashRoot (0.00s)
=== RUN   TestChecksummedAddress
=== RUN   TestChecksummedAddress/0x5aAeb6053F3E94C9b9A09f33669435E7Ef1BeAed
=== RUN   TestChecksummedAddress/0xfB6916095ca1df60bB79Ce92cE3Ea74c37c5d359
=== RUN   TestChecksummedAddress/0xdbF03B407c01E7cD3CBea99509d93f8DDDC8C6FB
=== RUN   TestChecksummedAddress/0xD1220A0cf47c7B9Be7A2E6BA89F429762e7b9aDb
--- PASS: TestChecksummedAddress (0.00s)
    --- PASS: TestChecksummedAddress/0x5aAeb6053F3E94C9b9A09f33669435E7Ef1BeAed (0.00s)
    --- PASS: TestChecksummedAddress/0xfB6916095ca1df60bB79Ce92cE3Ea74c37c5d359 (0.00s)
    --- PASS: TestChecksummedAddress/0xdbF03B407c01E7cD3CBea99509d93f8DDDC8C6FB (0.00s)
    --- PASS: TestChecksummedAddress/0xD1220A0cf47c7B9Be7A2E6BA89F429762e7b9aDb (0.00s)
=== RUN   TestInvalidAddrs
=== RUN   TestInvalidAddrs/0x000000000000000000000000000000000000dead
=== RUN   TestInvalidAddrs/0x0000000000000000000000000000000000000dead
=== RUN   TestInvalidAddrs/0x000000000000000000000000000000000000bar
=== RUN   TestInvalidAddrs/0000000000000000000000000000000000000dead
--- PASS: TestInvalidAddrs (0.00s)
    --- PASS: TestInvalidAddrs/0x000000000000000000000000000000000000dead (0.00s)
    --- PASS: TestInvalidAddrs/0x0000000000000000000000000000000000000dead (0.00s)
    --- PASS: TestInvalidAddrs/0x000000000000000000000000000000000000bar (0.00s)
    --- PASS: TestInvalidAddrs/0000000000000000000000000000000000000dead (0.00s)
=== RUN   TestPublicKeyToAddress
--- PASS: TestPublicKeyToAddress (0.01s)
=== RUN   TestForkVersionToChainID
--- PASS: TestForkVersionToChainID (0.00s)
=== RUN   TestForkVersionToNetwork
--- PASS: TestForkVersionToNetwork (0.00s)
=== RUN   TestNetworkToForkVersion
--- PASS: TestNetworkToForkVersion (0.00s)
=== RUN   TestNetworkToForkVersionBytes
--- PASS: TestNetworkToForkVersionBytes (0.00s)
=== RUN   TestSupportedNetwork
=== RUN   TestSupportedNetwork/supported_network
=== RUN   TestSupportedNetwork/supported_network#01
=== RUN   TestSupportedNetwork/unsupported_network
--- PASS: TestSupportedNetwork (0.00s)
    --- PASS: TestSupportedNetwork/supported_network (0.00s)
    --- PASS: TestSupportedNetwork/supported_network#01 (0.00s)
    --- PASS: TestSupportedNetwork/unsupported_network (0.00s)
=== RUN   TestEpochHashRoot
--- PASS: TestEpochHashRoot (0.00s)
=== RUN   TestUnmarshallingSignedEpoch
--- PASS: TestUnmarshallingSignedEpoch (0.00s)
PASS
coverage: 16.6% of statements
ok      github.com/obolnetwork/charon/eth2util  0.657s  coverage: 16.6% of statements
=== RUN   TestWithdrawalCredentials
--- PASS: TestWithdrawalCredentials (0.00s)
=== RUN   TestNewMessage
=== RUN   TestNewMessage/amount_below_minimum
=== RUN   TestNewMessage/amount_above_maximum
--- PASS: TestNewMessage (0.00s)
    --- PASS: TestNewMessage/amount_below_minimum (0.00s)
    --- PASS: TestNewMessage/amount_above_maximum (0.00s)
=== RUN   TestMarshalDepositData
--- PASS: TestMarshalDepositData (0.01s)
=== RUN   TestVerifyDepositAmounts
=== RUN   TestVerifyDepositAmounts/empty_slice
=== RUN   TestVerifyDepositAmounts/valid_amounts
=== RUN   TestVerifyDepositAmounts/each_amount_is_greater_than_1ETH
=== RUN   TestVerifyDepositAmounts/total_sum_is_32ETH
--- PASS: TestVerifyDepositAmounts (0.00s)
    --- PASS: TestVerifyDepositAmounts/empty_slice (0.00s)
    --- PASS: TestVerifyDepositAmounts/valid_amounts (0.00s)
    --- PASS: TestVerifyDepositAmounts/each_amount_is_greater_than_1ETH (0.00s)
```

```
    --- PASS: TestVerifyDepositAmounts/total_sum_is_32ETH (0.00s)
=== RUN   TestEthsToGweis
=== RUN   TestEthsToGweis/nil_slice
=== RUN   TestEthsToGweis/values
--- PASS: TestEthsToGweis (0.00s)
    --- PASS: TestEthsToGweis/nil_slice (0.00s)
    --- PASS: TestEthsToGweis/values (0.00s)
=== RUN   TestGetDepositFilePath
--- PASS: TestGetDepositFilePath (0.00s)
=== RUN   TestWriteDepositDataFile
=== RUN   TestWriteDepositDataFile/empty_deposit_datas
=== RUN   TestWriteDepositDataFile/not_equal_amounts
--- PASS: TestWriteDepositDataFile (0.02s)
    --- PASS: TestWriteDepositDataFile/empty_deposit_datas (0.00s)
    --- PASS: TestWriteDepositDataFile/not_equal_amounts (0.00s)
=== RUN   TestWriteClusterDepositDataFiles
--- PASS: TestWriteClusterDepositDataFiles (0.09s)
=== RUN   TestDedupAmounts
--- PASS: TestDedupAmounts (0.00s)
PASS
coverage: 22.3% of statements
ok      github.com/obolnetwork/charon/eth2util/deposit  0.897s  coverage: 22.3% of statements
=== RUN   TestCreatorHash
--- PASS: TestCreatorHash (0.00s)
PASS
coverage: 86.4% of statements
ok      github.com/obolnetwork/charon/eth2util/eip712   0.883s  coverage: 86.4% of statements
=== RUN   TestBackwardsENR
--- PASS: TestBackwardsENR (0.06s)
=== RUN   TestParse
--- PASS: TestParse (0.00s)
=== RUN   TestEncodeDecode
--- PASS: TestEncodeDecode (0.00s)
=== RUN   TestIPTCP
--- PASS: TestIPTCP (0.00s)
=== RUN   TestNew
--- PASS: TestNew (0.00s)
=== RUN   TestParseDuplicateKeys
--- PASS: TestParseDuplicateKeys (0.00s)
PASS
coverage: 18.5% of statements
ok      github.com/obolnetwork/charon/eth2util/enr  0.707s  coverage: 18.5% of statements
=== RUN   TestIsAttAggregator
=== RUN   TestIsAttAggregator/aggregator
=== RUN   TestIsAttAggregator/not_an_aggregator
--- PASS: TestIsAttAggregator (0.01s)
    --- PASS: TestIsAttAggregator/aggregator (0.00s)
    --- PASS: TestIsAttAggregator/not_an_aggregator (0.00s)
=== RUN   TestIsSyncCommAggregator
--- PASS: TestIsSyncCommAggregator (0.01s)
PASS
coverage: 10.8% of statements
ok      github.com/obolnetwork/charon/eth2util/eth2exp  0.260s  coverage: 10.8% of statements
=== RUN   TestImportKeystores
=== RUN   TestImportKeystores/2xx_response
=== RUN   TestImportKeystores/4xx_response
=== RUN   TestImportKeystores/mismatching_lengths
=== RUN   TestImportKeystores/malformed_keymanager_base_URL
--- PASS: TestImportKeystores (0.01s)
    --- PASS: TestImportKeystores/2xx_response (0.00s)
    --- PASS: TestImportKeystores/4xx_response (0.00s)
    --- PASS: TestImportKeystores/mismatching_lengths (0.00s)
    --- PASS: TestImportKeystores/malformed_keymanager_base_URL (0.00s)
=== RUN   TestVerifyConnection
=== RUN   TestVerifyConnection/successful_ping
=== RUN   TestVerifyConnection/cannot_ping_address
=== RUN   TestVerifyConnection/invalid_address
--- PASS: TestVerifyConnection (0.00s)
    --- PASS: TestVerifyConnection/successful_ping (0.00s)
    --- PASS: TestVerifyConnection/cannot_ping_address (0.00s)
    --- PASS: TestVerifyConnection/invalid_address (0.00s)
PASS
```

```
coverage: 15.1% of statements
ok      github.com/obolnetwork/charon/eth2util/keymanager   0.380s  coverage: 15.1% of statements
=== RUN   TestStoreLoad
--- PASS: TestStoreLoad (0.01s)
=== RUN   TestStoreLoadNonCharonNames
--- PASS: TestStoreLoadNonCharonNames (0.02s)
=== RUN   TestStoreLoadKeysAll
--- PASS: TestStoreLoadKeysAll (0.01s)
=== RUN   TestStoreLoadKeysAllNonSequentialIdx
--- PASS: TestStoreLoadKeysAllNonSequentialIdx (0.01s)
=== RUN   TestStoreLoadSequentialNonCharonNames
--- PASS: TestStoreLoadSequentialNonCharonNames (0.01s)
=== RUN   TestLoadEmpty
--- PASS: TestLoadEmpty (0.00s)
=== RUN   TestLoadScrypt
--- PASS: TestLoadScrypt (0.70s)
=== RUN   TestSequencedKeys
=== RUN   TestSequencedKeys/happy_1
=== RUN   TestSequencedKeys/happy_2
=== RUN   TestSequencedKeys/happy_4
=== RUN   TestSequencedKeys/missing_0
=== RUN   TestSequencedKeys/missing_2
=== RUN   TestSequencedKeys/missing_range
=== RUN   TestSequencedKeys/happy_20
=== RUN   TestSequencedKeys/single_non-numeric
=== RUN   TestSequencedKeys/all_non-numeric
--- PASS: TestSequencedKeys (0.13s)
    --- PASS: TestSequencedKeys/happy_1 (0.01s)
    --- PASS: TestSequencedKeys/happy_2 (0.03s)
    --- PASS: TestSequencedKeys/happy_4 (0.01s)
    --- PASS: TestSequencedKeys/missing_0 (0.01s)
    --- PASS: TestSequencedKeys/missing_2 (0.01s)
    --- PASS: TestSequencedKeys/missing_range (0.00s)
    --- PASS: TestSequencedKeys/happy_20 (0.05s)
    --- PASS: TestSequencedKeys/single_non-numeric (0.01s)
    --- PASS: TestSequencedKeys/all_non-numeric (0.01s)
=== RUN   TestCheckDir
--- PASS: TestCheckDir (0.00s)
PASS
coverage: 20.8% of statements
ok      github.com/obolnetwork/charon/eth2util/keystore 1.107s  coverage: 20.8% of statements
=== RUN   TestNewMessage
--- PASS: TestNewMessage (0.00s)
=== RUN   TestNewMessageBadAddress
--- PASS: TestNewMessageBadAddress (0.00s)
=== RUN   TestGetMessageSigningRoot
--- PASS: TestGetMessageSigningRoot (0.00s)
=== RUN   TestVerifySignedRegistration
--- PASS: TestVerifySignedRegistration (0.01s)
PASS
coverage: 12.2% of statements
ok      github.com/obolnetwork/charon/eth2util/registration 0.266s  coverage: 12.2% of statements
=== RUN   TestDecodeLength
=== RUN   TestDecodeLength/ok
=== RUN   TestDecodeLength/prefix_absent
=== RUN   TestDecodeLength/prefix_provided_but_length_absent
--- PASS: TestDecodeLength (0.00s)
    --- PASS: TestDecodeLength/ok (0.00s)
    --- PASS: TestDecodeLength/prefix_absent (0.00s)
    --- PASS: TestDecodeLength/prefix_provided_but_length_absent (0.00s)
=== RUN   TestBytesList
=== RUN   TestBytesList/0
=== RUN   TestBytesList/1
=== RUN   TestBytesList/2
--- PASS: TestBytesList (0.00s)
    --- PASS: TestBytesList/0 (0.00s)
    --- PASS: TestBytesList/1 (0.00s)
    --- PASS: TestBytesList/2 (0.00s)
=== RUN   TestBytes
=== RUN   TestBytes/0
=== RUN   TestBytes/1
=== RUN   TestBytes/2
```

```
=== RUN   TestBytes/3
=== RUN   TestBytes/4
=== RUN   TestBytes/5
--- PASS: TestBytes (0.00s)
    --- PASS: TestBytes/0 (0.00s)
    --- PASS: TestBytes/1 (0.00s)
    --- PASS: TestBytes/2 (0.00s)
    --- PASS: TestBytes/3 (0.00s)
    --- PASS: TestBytes/4 (0.00s)
    --- PASS: TestBytes/5 (0.00s)
=== RUN   TestLengths
=== RUN   TestLengths/0
=== RUN   TestLengths/1
=== RUN   TestLengths/55
=== RUN   TestLengths/56
=== RUN   TestLengths/1023
=== RUN   TestLengths/1024
--- PASS: TestLengths (0.00s)
    --- PASS: TestLengths/0 (0.00s)
    --- PASS: TestLengths/1 (0.00s)
    --- PASS: TestLengths/55 (0.00s)
    --- PASS: TestLengths/56 (0.00s)
    --- PASS: TestLengths/1023 (0.00s)
    --- PASS: TestLengths/1024 (0.00s)
=== RUN   FuzzDecodeBytesList
=== RUN   FuzzDecodeBytesList/seed#0
--- PASS: FuzzDecodeBytesList (0.00s)
    --- PASS: FuzzDecodeBytesList/seed#0 (0.00s)
=== RUN   FuzzDecodeBytes
=== RUN   FuzzDecodeBytes/seed#0
--- PASS: FuzzDecodeBytes (0.00s)
    --- PASS: FuzzDecodeBytes/seed#0 (0.00s)
=== RUN   FuzzEncodeBytesList
=== RUN   FuzzEncodeBytesList/seed#0
=== RUN   FuzzEncodeBytesList/seed#1
=== RUN   FuzzEncodeBytesList/seed#2
=== RUN   FuzzEncodeBytesList/seed#3
=== RUN   FuzzEncodeBytesList/seed#4
=== RUN   FuzzEncodeBytesList/seed#5
=== RUN   FuzzEncodeBytesList/seed#6
=== RUN   FuzzEncodeBytesList/seed#7
=== RUN   FuzzEncodeBytesList/seed#8
=== RUN   FuzzEncodeBytesList/seed#9
--- PASS: FuzzEncodeBytesList (0.00s)
    --- PASS: FuzzEncodeBytesList/seed#0 (0.00s)
    --- PASS: FuzzEncodeBytesList/seed#1 (0.00s)
    --- PASS: FuzzEncodeBytesList/seed#2 (0.00s)
    --- PASS: FuzzEncodeBytesList/seed#3 (0.00s)
    --- PASS: FuzzEncodeBytesList/seed#4 (0.00s)
    --- PASS: FuzzEncodeBytesList/seed#5 (0.00s)
    --- PASS: FuzzEncodeBytesList/seed#6 (0.00s)
    --- PASS: FuzzEncodeBytesList/seed#7 (0.00s)
    --- PASS: FuzzEncodeBytesList/seed#8 (0.00s)
    --- PASS: FuzzEncodeBytesList/seed#9 (0.00s)
=== RUN   FuzzEncodeBytes
=== RUN   FuzzEncodeBytes/seed#0
--- PASS: FuzzEncodeBytes (0.00s)
    --- PASS: FuzzEncodeBytes/seed#0 (0.00s)
PASS
coverage: 18.0% of statements
ok      github.com/obolnetwork/charon/eth2util/rlp  0.242s  coverage: 18.0% of statements
=== RUN   TestVerifyRegistrationReference
--- PASS: TestVerifyRegistrationReference (0.01s)
=== RUN   TestConstantApplicationBuilder
--- PASS: TestConstantApplicationBuilder (0.01s)
PASS
coverage: 11.6% of statements
ok      github.com/obolnetwork/charon/eth2util/signing  0.230s  coverage: 11.6% of statements
=== RUN   TestResolveListenAddr
=== RUN   TestResolveListenAddr/:1234
=== RUN   TestResolveListenAddr/10.4.3.3:1234
--- PASS: TestResolveListenAddr (0.00s)
```

```
    --- PASS: TestResolveListenAddr/:1234 (0.00s)
    --- PASS: TestResolveListenAddr/10.4.3.3:1234 (0.00s)
=== RUN   TestConfig_Multiaddrs
--- PASS: TestConfig_Multiaddrs (0.00s)
=== RUN   TestNamedAddr
--- PASS: TestNamedAddr (0.00s)
=== RUN   TestDialErrMsgs
--- PASS: TestDialErrMsgs (0.02s)
=== RUN   TestFilterAdvertisedAddrs
=== RUN   TestFilterAdvertisedAddrs/empty
=== RUN   TestFilterAdvertisedAddrs/drop_one_private
=== RUN   TestFilterAdvertisedAddrs/keep_one_private
=== RUN   TestFilterAdvertisedAddrs/duplicate_public
=== RUN   TestFilterAdvertisedAddrs/duplicate_private
=== RUN   TestFilterAdvertisedAddrs/drop_all_private
--- PASS: TestFilterAdvertisedAddrs (0.00s)
    --- PASS: TestFilterAdvertisedAddrs/empty (0.00s)
    --- PASS: TestFilterAdvertisedAddrs/drop_one_private (0.00s)
    --- PASS: TestFilterAdvertisedAddrs/keep_one_private (0.00s)
    --- PASS: TestFilterAdvertisedAddrs/duplicate_public (0.00s)
    --- PASS: TestFilterAdvertisedAddrs/duplicate_private (0.00s)
    --- PASS: TestFilterAdvertisedAddrs/drop_all_private (0.00s)
=== RUN   TestSenderAddResult
14:18:58.473 [33mWARN [0m [32m          [0m P2P sending failing: failure            {"peer": "better-
week"}
    p2p/sender_internal_test.go:28 .TestSenderAddResult
14:18:58.473 [34mINFO [0m [32m          [0m P2P sending recovered                   {"peer": "better-
week"}
14:18:58.473 [33mWARN [0m [32m          [0m P2P sending failing: failure            {"peer": "better-
week"}
    p2p/sender_internal_test.go:28 .TestSenderAddResult
--- PASS: TestSenderAddResult (0.00s)
=== RUN   TestAddResult
--- PASS: TestAddResult (0.00s)
=== RUN   TestSenderRetry
14:18:58.575 [33mWARN [0m [32m          [0m P2P sending failing: new stream: stream reset {"peer":
"adorable-adult", "protocols": "[]"}
    p2p/sender.go:276 .SendReceive
    p2p/sender.go:168 .func1
    p2p/sender.go:180 .withRelayRetry
    p2p/sender.go:167 .SendReceive
    p2p/sender_internal_test.go:98 .TestSenderRetry
--- PASS: TestSenderRetry (0.20s)
=== RUN   TestProtocolPrefix
--- PASS: TestProtocolPrefix (0.00s)
=== RUN   TestIsZeroProto
--- PASS: TestIsZeroProto (0.00s)
=== RUN   TestNonZeroResponse
--- PASS: TestNonZeroResponse (0.00s)
=== RUN   TestInterceptSecured
=== RUN   TestInterceptSecured/0
=== RUN   TestInterceptSecured/1
--- PASS: TestInterceptSecured (0.00s)
    --- PASS: TestInterceptSecured/0 (0.00s)
    --- PASS: TestInterceptSecured/1 (0.00s)
=== RUN   TestP2PConnGating
--- PASS: TestP2PConnGating (0.01s)
=== RUN   TestOpenGater
--- PASS: TestOpenGater (0.00s)
=== RUN   TestPeerName
--- PASS: TestPeerName (0.00s)
=== RUN   Test
=== RUN   Test/different-course
--- PASS: Test (0.00s)
    --- PASS: Test/different-course (0.00s)
=== RUN   TestNewPeer
--- PASS: TestNewPeer (0.00s)
=== RUN   TestNewHost
14:18:58.683 [34mINFO [0m [32m          [0m LibP2P not accepting incoming connections since --p2p-tcp-
addresses empty
--- PASS: TestNewHost (0.00s)
=== RUN   TestVerifyP2PKey
```

```
--- PASS: TestVerifyP2PKey (0.01s)
=== RUN   TestPeerIDKey
--- PASS: TestPeerIDKey (0.00s)
=== RUN   TestSendReceive
=== RUN   TestSendReceive/ok
14:18:58.705 [34mINFO [0m [32mserver    [0m See protocol logging field              {"peer": "tender-
pencil", "protocol": "delimited"}
=== RUN   TestSendReceive/empty_response
14:18:58.705 [34mINFO [0m [32mserver    [0m See protocol logging field              {"peer": "tender-
pencil", "protocol": "delimited"}
--- PASS: TestSendReceive (0.01s)
    --- PASS: TestSendReceive/ok (0.00s)
    --- PASS: TestSendReceive/empty_response (0.00s)
=== RUN   TestWithReceiveTimeout
--- PASS: TestWithReceiveTimeout (0.01s)
=== RUN   TestWithSendTimeout
--- PASS: TestWithSendTimeout (0.01s)
=== RUN   TestSend
=== RUN   TestSend/non-delimited_client_and_server
=== RUN   TestSend/non-delimited_client_and_server/ok
14:18:58.727 [34mINFO [0m [32mserver    [0m See protocol logging field              {"peer": "misty-
face", "protocol": "undelimited"}
=== RUN   TestSend/delimited_client_and_server
=== RUN   TestSend/delimited_client_and_server/ok
14:18:58.736 [34mINFO [0m [32mserver    [0m See protocol logging field              {"peer": "frantic-
trade", "protocol": "delimited"}
=== RUN   TestSend/delimited_client_and_non-delimited_server
=== RUN   TestSend/delimited_client_and_non-delimited_server/ok
14:18:58.743 [34mINFO [0m [32mserver    [0m See protocol logging field              {"peer": "dark-
state", "protocol": "undelimited"}
=== RUN   TestSend/non-delimited_client_and_delimited_server
=== RUN   TestSend/non-delimited_client_and_delimited_server/ok
14:18:58.750 [34mINFO [0m [32mserver    [0m See protocol logging field              {"peer": "alive-
city", "protocol": "undelimited"}
=== RUN   TestSend/delimited_only_client_and_delimited_server
=== RUN   TestSend/delimited_only_client_and_delimited_server/ok
14:18:58.757 [34mINFO [0m [32mserver    [0m See protocol logging field              {"peer": "lovely-
picture", "protocol": "delimited"}
=== RUN   TestSend/delimited_client_and_delimited_only_server
=== RUN   TestSend/delimited_client_and_delimited_only_server/ok
14:18:58.765 [34mINFO [0m [32mserver    [0m See protocol logging field              {"peer":
"mysterious-clothes", "protocol": "delimited"}
=== RUN   TestSend/delimited_only_client_and_delimited_only_server
=== RUN   TestSend/delimited_only_client_and_delimited_only_server/ok
14:18:58.771 [34mINFO [0m [32mserver    [0m See protocol logging field              {"peer":
"magnificent-waterfall", "protocol": "delimited"}
=== RUN   TestSend/delimited_only_client_and_non-delimited_server,_protocols_not_supported
=== RUN   TestSend/non-delimited_client_and_delimited_only_server,_protocols_not_supported
--- PASS: TestSend (0.06s)
    --- PASS: TestSend/non-delimited_client_and_server (0.01s)
        --- PASS: TestSend/non-delimited_client_and_server/ok (0.00s)
    --- PASS: TestSend/delimited_client_and_server (0.01s)
        --- PASS: TestSend/delimited_client_and_server/ok (0.00s)
    --- PASS: TestSend/delimited_client_and_non-delimited_server (0.01s)
        --- PASS: TestSend/delimited_client_and_non-delimited_server/ok (0.00s)
    --- PASS: TestSend/non-delimited_client_and_delimited_server (0.01s)
        --- PASS: TestSend/non-delimited_client_and_delimited_server/ok (0.00s)
    --- PASS: TestSend/delimited_only_client_and_delimited_server (0.01s)
        --- PASS: TestSend/delimited_only_client_and_delimited_server/ok (0.00s)
    --- PASS: TestSend/delimited_client_and_delimited_only_server (0.01s)
        --- PASS: TestSend/delimited_client_and_delimited_only_server/ok (0.00s)
    --- PASS: TestSend/delimited_only_client_and_delimited_only_server (0.01s)
        --- PASS: TestSend/delimited_only_client_and_delimited_only_server/ok (0.00s)
    --- PASS: TestSend/delimited_only_client_and_non-delimited_server,_protocols_not_supported (0.01s)
    --- PASS: TestSend/non-delimited_client_and_delimited_only_server,_protocols_not_supported (0.01s)
PASS
coverage: 27.1% of statements
ok      github.com/obolnetwork/charon/p2p   0.804s  coverage: 27.1% of statements
=== RUN   TestHerumiImplementation
=== RUN   TestHerumiImplementation/Test_GenerateSecretKey
=== RUN   TestHerumiImplementation/Test_RecoverSecret
=== RUN   TestHerumiImplementation/Test_SecretToPublicKey
```

```
=== RUN   TestHerumiImplementation/Test_Sign
=== RUN   TestHerumiImplementation/Test_ThresholdAggregate
=== RUN   TestHerumiImplementation/Test_ThresholdSplit
=== RUN   TestHerumiImplementation/Test_Verify
=== RUN   TestHerumiImplementation/Test_VerifyAggregate
--- PASS: TestHerumiImplementation (0.02s)
    --- PASS: TestHerumiImplementation/Test_GenerateSecretKey (0.00s)
    --- PASS: TestHerumiImplementation/Test_RecoverSecret (0.00s)
    --- PASS: TestHerumiImplementation/Test_SecretToPublicKey (0.00s)
    --- PASS: TestHerumiImplementation/Test_Sign (0.00s)
    --- PASS: TestHerumiImplementation/Test_ThresholdAggregate (0.00s)
    --- PASS: TestHerumiImplementation/Test_ThresholdSplit (0.00s)
    --- PASS: TestHerumiImplementation/Test_Verify (0.00s)
    --- PASS: TestHerumiImplementation/Test_VerifyAggregate (0.01s)
=== RUN   TestRandomized
=== RUN   TestRandomized/Test_GenerateSecretKey
=== RUN   TestRandomized/Test_RecoverSecret
=== RUN   TestRandomized/Test_SecretToPublicKey
=== RUN   TestRandomized/Test_Sign
=== RUN   TestRandomized/Test_ThresholdAggregate
=== RUN   TestRandomized/Test_ThresholdSplit
=== RUN   TestRandomized/Test_Verify
=== RUN   TestRandomized/Test_VerifyAggregate
--- PASS: TestRandomized (0.01s)
    --- PASS: TestRandomized/Test_GenerateSecretKey (0.00s)
    --- PASS: TestRandomized/Test_RecoverSecret (0.00s)
    --- PASS: TestRandomized/Test_SecretToPublicKey (0.00s)
    --- PASS: TestRandomized/Test_Sign (0.00s)
    --- PASS: TestRandomized/Test_ThresholdAggregate (0.00s)
    --- PASS: TestRandomized/Test_ThresholdSplit (0.00s)
    --- PASS: TestRandomized/Test_Verify (0.00s)
    --- PASS: TestRandomized/Test_VerifyAggregate (0.01s)
=== RUN   FuzzRandomImplementations
--- PASS: FuzzRandomImplementations (0.00s)
PASS
coverage: 58.2% of statements
ok      github.com/obolnetwork/charon/tbls  0.211s  coverage: 58.2% of statements
=== RUN   TestPrivkeyFromBytes
=== RUN   TestPrivkeyFromBytes/empty_input
=== RUN   TestPrivkeyFromBytes/more_data_than_expected
=== RUN   TestPrivkeyFromBytes/less_data_than_expected
=== RUN   TestPrivkeyFromBytes/enough_data
--- PASS: TestPrivkeyFromBytes (0.00s)
    --- PASS: TestPrivkeyFromBytes/empty_input (0.00s)
    --- PASS: TestPrivkeyFromBytes/more_data_than_expected (0.00s)
    --- PASS: TestPrivkeyFromBytes/less_data_than_expected (0.00s)
    --- PASS: TestPrivkeyFromBytes/enough_data (0.00s)
=== RUN   TestPubkeyFromBytes
=== RUN   TestPubkeyFromBytes/empty_input
=== RUN   TestPubkeyFromBytes/more_data_than_expected
=== RUN   TestPubkeyFromBytes/less_data_than_expected
=== RUN   TestPubkeyFromBytes/enough_data
--- PASS: TestPubkeyFromBytes (0.00s)
    --- PASS: TestPubkeyFromBytes/empty_input (0.00s)
    --- PASS: TestPubkeyFromBytes/more_data_than_expected (0.00s)
    --- PASS: TestPubkeyFromBytes/less_data_than_expected (0.00s)
    --- PASS: TestPubkeyFromBytes/enough_data (0.00s)
=== RUN   TestPubkeyToETH2
--- PASS: TestPubkeyToETH2 (0.00s)
=== RUN   TestPubkeyFromCore
--- PASS: TestPubkeyFromCore (0.00s)
=== RUN   TestSignatureFromBytes
=== RUN   TestSignatureFromBytes/empty_input
=== RUN   TestSignatureFromBytes/more_data_than_expected
=== RUN   TestSignatureFromBytes/less_data_than_expected
=== RUN   TestSignatureFromBytes/enough_data
--- PASS: TestSignatureFromBytes (0.00s)
    --- PASS: TestSignatureFromBytes/empty_input (0.00s)
    --- PASS: TestSignatureFromBytes/more_data_than_expected (0.00s)
    --- PASS: TestSignatureFromBytes/less_data_than_expected (0.00s)
    --- PASS: TestSignatureFromBytes/enough_data (0.00s)
=== RUN   TestSigFromCore
```

```
=== RUN   TestSigFromCore/empty_input
=== RUN   TestSigFromCore/more_data_than_expected
=== RUN   TestSigFromCore/less_data_than_expected
=== RUN   TestSigFromCore/enough_data
--- PASS: TestSigFromCore (0.00s)
    --- PASS: TestSigFromCore/empty_input (0.00s)
    --- PASS: TestSigFromCore/more_data_than_expected (0.00s)
    --- PASS: TestSigFromCore/less_data_than_expected (0.00s)
    --- PASS: TestSigFromCore/enough_data (0.00s)
=== RUN   TestSigToCore
--- PASS: TestSigToCore (0.00s)
=== RUN   TestSigToETH2
--- PASS: TestSigToETH2 (0.00s)
PASS
coverage: 11.1% of statements
ok      github.com/obolnetwork/charon/tbls/tblsconv 0.580s  coverage: 11.1% of statements
```

Code Coverage

The total statement coverage is relatively low at a total of 62.5%. We have obtained this value by running:

```
go tool cover -func coverprofile-complete
```

- charon/app/app.go:127: Run 0.0%
- charon/app/app.go:285: wirePeerInfo 0.0%
- charon/app/app.go:292: wireP2P 0.0%
- charon/app/app.go:344: wireCoreWorkflow 0.0%
- charon/app/app.go:546: wirePrioritise 0.0%
- charon/app/app.go:595: wireRecaster 0.0%
- charon/app/app.go:664: newTracker 0.0%
- charon/app/app.go:702: calculateTrackerDelay 82.4%
- charon/app/app.go:734: eth2PubKeys 0.0%
- charon/app/app.go:752: newETH2Client 0.0%
- charon/app/app.go:870: newConsensus 0.0%
- charon/app/app.go:888: createMockValidators 0.0%
- charon/app/app.go:911: wireVAPIRouter 0.0%
- charon/app/app.go:937: wireTracing 0.0%
- charon/app/app.go:952: setFeeRecipient 83.3%
- charon/app/app.go:997: getDVPubkeys 0.0%
- charon/app/app.go:1018: Call 0.0%
- charon/app/app.go:1030: Protocols 0.0%
- charon/app/app.go:1041: ProposalTypes 0.0%
- charon/app/app.go:1055: hex7 0.0%
- charon/app/app.go:1065: slotFromTimestamp 69.2%
- charon/app/disk.go:16: loadClusterManifest 0.0%
- charon/app/errors/context.go:13: WithCtxErr 100.0%
- charon/app/errors/context.go:28: Err 75.0%
- charon/app/errors/errors.go:18: New 100.0%
- charon/app/errors/errors.go:48: NewSentinel 0.0%
- charon/app/errors/errors.go:56: Wrap 100.0%
- charon/app/errors/errors.go:61: SkipWrap 100.0%
- charon/app/errors/errors.go:90: Error 100.0%
- charon/app/errors/errors.go:95: Fields 0.0%
- charon/app/errors/errors.go💯 Stack 0.0%
- charon/app/errors/errors.go:106: Unwrap 100.0%
- charon/app/errors/errors.go:111: Is 100.0%
- charon/app/errors/go113.go:20: Is 100.0%
- charon/app/errors/go113.go:35: As 100.0%
- charon/app/errors/go113.go:40: Unwrap 0.0%
- charon/app/eth2wrap/eth2wrap.go:55: Instrument 66.7%
- charon/app/eth2wrap/eth2wrap.go:64: WithSyntheticDuties 100.0%
- charon/app/eth2wrap/eth2wrap.go:73: NewMultiHTTP 92.3%
- charon/app/eth2wrap/eth2wrap.go:101: newMulti 100.0%
- charon/app/eth2wrap/eth2wrap.go:117: Name 0.0%
- charon/app/eth2wrap/eth2wrap.go:121: Address 100.0%
- charon/app/eth2wrap/eth2wrap.go:130: SetValidatorCache 0.0%
- charon/app/eth2wrap/eth2wrap.go:136: ActiveValidators 71.4%

- charon/app/eth2wrap/eth2wrap.go:154: ProposerConfig 0.0%
- charon/app/eth2wrap/eth2wrap.go:172: AggregateBeaconCommitteeSelections 0.0%
- charon/app/eth2wrap/eth2wrap.go:190: AggregateSyncCommitteeSelections 0.0%
- charon/app/eth2wrap/eth2wrap.go:208: BlockAttestations 0.0%
- charon/app/eth2wrap/eth2wrap.go:226: NodePeerCount 0.0%
- charon/app/eth2wrap/eth2wrap.go:247: provide 95.5%
- charon/app/eth2wrap/eth2wrap.go:295: submit 100.0%
- charon/app/eth2wrap/eth2wrap.go:310: latency 100.0%
- charon/app/eth2wrap/eth2wrap.go:318: incError 100.0%
- charon/app/eth2wrap/eth2wrap.go:323: wrapError 88.2%
- charon/app/eth2wrap/eth2wrap.go:363: newBestSelector 100.0%
- charon/app/eth2wrap/eth2wrap.go:380: BestAddress 100.0%
- charon/app/eth2wrap/eth2wrap.go:397: Increment 66.7%
- charon/app/eth2wrap/eth2wrap_gen.go:71: SlotDuration 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:93: SlotsPerEpoch 100.0%
- charon/app/eth2wrap/eth2wrap_gen.go:112: SignedBeaconBlock 100.0%
- charon/app/eth2wrap/eth2wrap_gen.go:132: AggregateAttestation 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:152: SubmitAggregateAttestations 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:172: AttestationData 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:192: SubmitAttestations 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:212: AttesterDuties 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:233: DepositContract 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:253: SyncCommitteeDuties 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:273: SubmitSyncCommitteeMessages 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:293: SubmitSyncCommitteeSubscriptions 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:313: SyncCommitteeContribution 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:333: SubmitSyncCommitteeContributions 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:353: Proposal 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:374: BeaconBlockRoot 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:393: SubmitProposal 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:413: SubmitBeaconCommitteeSubscriptions 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:433: BlindedProposal 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:453: SubmitBlindedProposal 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:473: SubmitValidatorRegistrations 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:493: Fork 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:513: ForkSchedule 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:534: Genesis 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:553: NodeSyncing 100.0%
- charon/app/eth2wrap/eth2wrap_gen.go:574: NodeVersion 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:595: SubmitProposalPreparations 71.4%
- charon/app/eth2wrap/eth2wrap_gen.go:614: ProposerDuties 75.0%
- charon/app/eth2wrap/eth2wrap_gen.go:635: Spec 100.0%
- charon/app/eth2wrap/eth2wrap_gen.go:654: Validators 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:674: SubmitVoluntaryExit 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:695: Domain 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:718: GenesisDomain 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:738: GenesisTime 100.0%
- charon/app/eth2wrap/eth2wrap_gen.go:759: SlotDuration 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:771: SlotsPerEpoch 75.0%
- charon/app/eth2wrap/eth2wrap_gen.go:781: SignedBeaconBlock 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:791: AggregateAttestation 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:801: SubmitAggregateAttestations 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:811: AttestationData 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:821: SubmitAttestations 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:831: AttesterDuties 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:841: DepositContract 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:852: SyncCommitteeDuties 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:862: SubmitSyncCommitteeMessages 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:872: SubmitSyncCommitteeSubscriptions 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:882: SyncCommitteeContribution 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:892: SubmitSyncCommitteeContributions 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:902: Proposal 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:912: BeaconBlockRoot 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:922: SubmitProposal 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:932: SubmitBeaconCommitteeSubscriptions 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:942: BlindedProposal 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:952: SubmitBlindedProposal 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:962: SubmitValidatorRegistrations 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:972: Fork 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:982: ForkSchedule 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:992: Genesis 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:1002: NodeSyncing 100.0%

- charon/app/eth2wrap/eth2wrap_gen.go:1012: NodeVersion 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:1023: SubmitProposalPreparations 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:1033: ProposerDuties 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:1043: Spec 100.0%
- charon/app/eth2wrap/eth2wrap_gen.go:1053: Validators 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:1063: SubmitVoluntaryExit 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:1073: Domain 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:1086: GenesisDomain 0.0%
- charon/app/eth2wrap/eth2wrap_gen.go:1096: GenesisTime 0.0%
- charon/app/eth2wrap/genwrap/genwrap.go:159: Label 0.0%
- charon/app/eth2wrap/genwrap/genwrap.go:163: Params 0.0%
- charon/app/eth2wrap/genwrap/genwrap.go:172: Results 0.0%
- charon/app/eth2wrap/genwrap/genwrap.go:181: ParamNames 0.0%
- charon/app/eth2wrap/genwrap/genwrap.go:190: NamedResults 0.0%
- charon/app/eth2wrap/genwrap/genwrap.go:199: ResultNames 0.0%
- charon/app/eth2wrap/genwrap/genwrap.go:208: ResultTypes 0.0%
- charon/app/eth2wrap/genwrap/genwrap.go:222: main 0.0%
- charon/app/eth2wrap/genwrap/genwrap.go:230: run 0.0%
- charon/app/eth2wrap/genwrap/genwrap.go:258: parseImports 0.0%
- charon/app/eth2wrap/genwrap/genwrap.go:285: writeTemplate 0.0%
- charon/app/eth2wrap/genwrap/genwrap.go:321: parseEth2Methods 0.0%
- charon/app/eth2wrap/genwrap/genwrap.go:445: toSnakeCase 0.0%
- charon/app/eth2wrap/httpwrap.go:41: NewHTTPAdapterForT 100.0%
- charon/app/eth2wrap/httpwrap.go:47: AdaptEth2HTTP 100.0%
- charon/app/eth2wrap/httpwrap.go:52: newHTTPAdapter 100.0%
- charon/app/eth2wrap/httpwrap.go:71: SetValidatorCache 0.0%
- charon/app/eth2wrap/httpwrap.go:77: ActiveValidators 0.0%
- charon/app/eth2wrap/httpwrap.go:89: AggregateBeaconCommitteeSelections 0.0%
- charon/app/eth2wrap/httpwrap.go:109: AggregateSyncCommitteeSelections 0.0%
- charon/app/eth2wrap/httpwrap.go:130: BlockAttestations 75.0%
- charon/app/eth2wrap/httpwrap.go:150: ProposerConfig 0.0%
- charon/app/eth2wrap/httpwrap.go:168: NodePeerCount 0.0%
- charon/app/eth2wrap/httpwrap.go:203: httpPost 0.0%
- charon/app/eth2wrap/httpwrap.go:241: httpGet 73.7%
- charon/app/eth2wrap/lazy.go:16: newLazy 100.0%
- charon/app/eth2wrap/lazy.go:33: getClient 100.0%
- charon/app/eth2wrap/lazy.go:41: setClient 80.0%
- charon/app/eth2wrap/lazy.go:53: getOrCreateClient 92.9%
- charon/app/eth2wrap/lazy.go:83: Name 0.0%
- charon/app/eth2wrap/lazy.go:92: Address 100.0%
- charon/app/eth2wrap/lazy.go:101: ActiveValidators 0.0%
- charon/app/eth2wrap/lazy.go:110: SetValidatorCache 0.0%
- charon/app/eth2wrap/lazy.go:120: ProposerConfig 0.0%
- charon/app/eth2wrap/lazy.go:129: AggregateBeaconCommitteeSelections 0.0%
- charon/app/eth2wrap/lazy.go:138: AggregateSyncCommitteeSelections 0.0%
- charon/app/eth2wrap/lazy.go:147: BlockAttestations 0.0%
- charon/app/eth2wrap/lazy.go:156: NodePeerCount 0.0%
- charon/app/eth2wrap/success.go:12: isSyncStateOk 100.0%
- charon/app/eth2wrap/success.go:17: isAggregateAttestationOk 0.0%
- charon/app/eth2wrap/synthproposer.go:60: setFeeRecipients 100.0%
- charon/app/eth2wrap/synthproposer.go:70: getFeeRecipient 100.0%
- charon/app/eth2wrap/synthproposer.go:79: ProposerDuties 75.0%
- charon/app/eth2wrap/synthproposer.go:88: SubmitProposalPreparations 100.0%
- charon/app/eth2wrap/synthproposer.go:95: Proposal 83.3%
- charon/app/eth2wrap/synthproposer.go:117: BlindedProposal 73.3%
- charon/app/eth2wrap/synthproposer.go:144: syntheticProposal 47.7%
- charon/app/eth2wrap/synthproposer.go:217: fraction 100.0%
- charon/app/eth2wrap/synthproposer.go:222: SubmitBlindedProposal 100.0%
- charon/app/eth2wrap/synthproposer.go:232: SubmitProposal 50.0%
- charon/app/eth2wrap/synthproposer.go:242: GetSyntheticGraffiti 100.0%
- charon/app/eth2wrap/synthproposer.go:250: IsSyntheticBlindedBlock 57.1%
- charon/app/eth2wrap/synthproposer.go:267: IsSyntheticProposal 44.4%
- charon/app/eth2wrap/synthproposer.go:288: newSynthProposerCache 100.0%
- charon/app/eth2wrap/synthproposer.go:311: Duties 82.5%
- charon/app/eth2wrap/synthproposer.go:391: SyntheticVIdx 81.8%
- charon/app/eth2wrap/synthproposer.go:415: eth2Shuffle 100.0%
- charon/app/eth2wrap/synthproposer.go:439: getStandardHashFn 100.0%
- charon/app/eth2wrap/synthproposer.go:452: blindedProposal 57.1%
- charon/app/eth2wrap/synthproposer.go:580: wrapResponse 100.0%
- charon/app/eth2wrap/valcache.go:19: Pubkeys 0.0%
- charon/app/eth2wrap/valcache.go:29: Indices 100.0%
- charon/app/eth2wrap/valcache.go:45: NewValidatorCache 100.0%

- charon/app/eth2wrap/valcache.go:63: Trim 100.0%
- charon/app/eth2wrap/valcache.go:71: cached 100.0%
- charon/app/eth2wrap/valcache.go:79: Get 85.0%
- charon/app/expbackoff/expbackoff.go:49: WithFastConfig 0.0%
- charon/app/expbackoff/expbackoff.go:56: WithConfig 100.0%
- charon/app/expbackoff/expbackoff.go:63: WithMaxDelay 0.0%
- charon/app/expbackoff/expbackoff.go:70: WithBaseDelay 0.0%
- charon/app/expbackoff/expbackoff.go:92: New 0.0%
- charon/app/expbackoff/expbackoff.go:115: NewWithReset 100.0%
- charon/app/expbackoff/expbackoff.go:145: Backoff 92.3%
- charon/app/expbackoff/expbackoff.go:174: SetAfterForT 100.0%
- charon/app/expbackoff/expbackoff.go:187: SetRandFloatForT 100.0%
- charon/app/featureset/config.go:32: DefaultConfig 100.0%
- charon/app/featureset/config.go:39: Init 63.0%
- charon/app/featureset/config.go:87: EnableForT 100.0%
- charon/app/featureset/config.go:102: DisableForT 100.0%
- charon/app/featureset/featureset.go:58: Enabled 100.0%
- charon/app/featureset/status_string.go:9: _ 0.0%
- charon/app/featureset/status_string.go:22: String 75.0%
- charon/app/forkjoin/forkjoin.go:49: Flatten 100.0%
- charon/app/forkjoin/forkjoin.go:91: WithWaitOnCancel 100.0%
- charon/app/forkjoin/forkjoin.go:98: WithWorkers 0.0%
- charon/app/forkjoin/forkjoin.go:107: WithInputBuffer 0.0%
- charon/app/forkjoin/forkjoin.go:114: WithoutFailFast 100.0%
- charon/app/forkjoin/forkjoin.go:148: New 100.0%
- charon/app/forkjoin/forkjoin.go:253: NewWithInputs 0.0%
- charon/app/genssz/genssz.go:40: main 0.0%
- charon/app/genssz/genssz.go:56: run 0.0%
- charon/app/genssz/genssz.go:91: parseFile 0.0%
- charon/app/genssz/genssz.go:156: writeTemplate 0.0%
- charon/app/genssz/genssz.go:187: getPkg 0.0%
- charon/app/genssz/types.go:22: Abbr 0.0%
- charon/app/genssz/types.go:44: IsComposite 0.0%
- charon/app/genssz/types.go:48: IsCompositeList 0.0%
- charon/app/genssz/types.go:52: IsByteList 0.0%
- charon/app/genssz/types.go:56: IsBytesN 0.0%
- charon/app/genssz/types.go:60: IsUint64 0.0%
- charon/app/genssz/types.go:64: MustSize 0.0%
- charon/app/genssz/types.go:73: Size 0.0%
- charon/app/health/checker.go:29: NewChecker 0.0%
- charon/app/health/checker.go:54: Run 0.0%
- charon/app/health/checker.go:75: instrument 0.0%
- charon/app/health/checker.go:93: scrape 0.0%
- charon/app/health/checker.go:136: newQueryFunc 78.9%
- charon/app/health/checks.go:154: l 100.0%
- charon/app/health/reducers.go:15: increase 85.7%
- charon/app/health/reducers.go:31: gaugeMax 85.7%
- charon/app/health/select.go:16: maxLabel 0.0%
- charon/app/health/select.go:42: countNonZeroLabels 100.0%
- charon/app/health/select.go:59: noLabels 66.7%
- charon/app/health/select.go:68: countLabels 100.0%
- charon/app/health/select.go:87: sumLabels 90.0%
- charon/app/health/select.go:110: selectLabel 0.0%
- charon/app/health/select.go:127: labelsContain 100.0%
- charon/app/k1util/k1util.go:34: PublicKeyFromLibP2P 0.0%
- charon/app/k1util/k1util.go:46: Sign 83.3%
- charon/app/k1util/k1util.go:65: Verify65 75.0%
- charon/app/k1util/k1util.go:78: Verify64 66.7%
- charon/app/k1util/k1util.go:99: Recover 69.2%
- charon/app/k1util/k1util.go:129: Load 100.0%
- charon/app/k1util/k1util.go:144: Save 0.0%
- charon/app/k1util/k1util.go:156: to32Scalar 60.0%
- charon/app/lifecycle/hook.go:25: Call 100.0%
- charon/app/lifecycle/hook.go:32: Call 0.0%
- charon/app/lifecycle/hook.go:40: Call 0.0%
- charon/app/lifecycle/hook.go:47: Call 0.0%
- charon/app/lifecycle/hook.go:84: runHooks 94.7%
- charon/app/lifecycle/hook.go:130: startHook 50.0%
- charon/app/lifecycle/hook.go:139: startAllHooks 81.8%
- charon/app/lifecycle/hook.go:171: stopHook 50.0%
- charon/app/lifecycle/hook.go:182: stopAllHooks 75.0%
- charon/app/lifecycle/hook.go:195: getStackDump 0.0%

- charon/app/lifecycle/manager.go:32: RegisterStart 80.0%
- charon/app/lifecycle/manager.go:49: RegisterStop 80.0%
- charon/app/lifecycle/manager.go:65: Run 100.0%
- charon/app/lifecycle/orderstart_string.go:9: _ 0.0%
- charon/app/lifecycle/orderstart_string.go:35: String 66.7%
- charon/app/lifecycle/orderstop_string.go:9: _ 0.0%
- charon/app/lifecycle/orderstop_string.go:31: String 66.7%
- charon/app/log/config.go:61: Sync 0.0%
- charon/app/log/config.go:79: getLokiLabels 100.0%
- charon/app/log/config.go:87: SetLokiLabels 83.3%
- charon/app/log/config.go💯 LoggerCore 0.0%
- charon/app/log/config.go:118: ZapLevel 75.0%
- charon/app/log/config.go:128: InferColor 40.0%
- charon/app/log/config.go:142: DefaultConfig 0.0%
- charon/app/log/config.go:150: InitLogger 70.8%
- charon/app/log/config.go:249: WithClock 100.0%
- charon/app/log/config.go:258: NewConsoleForT 100.0%
- charon/app/log/config.go:263: InitConsoleForT 100.0%
- charon/app/log/config.go:271: InitJSONForT 100.0%
- charon/app/log/config.go:282: InitLogfmtForT 100.0%
- charon/app/log/config.go:293: Stop 80.0%
- charon/app/log/config.go:305: newStructuredLogger 90.9%
- charon/app/log/config.go:336: newDefaultLogger 100.0%
- charon/app/log/config.go:342: newConsoleEncoder 100.0%
- charon/app/log/config.go:363: newConsoleLogger 100.0%
- charon/app/log/config.go:372: newFileLogger 0.0%
- charon/app/log/config.go:388: EncodeEntry 90.0%
- charon/app/log/config.go:417: EncodeEntry 100.0%
- charon/app/log/config.go:455: formatZapStack 100.0%
- charon/app/log/config.go:495: newLevel4CharEncoder 100.0%
- charon/app/log/config.go:521: AppendString 100.0%
- charon/app/log/filter.go:19: WithFilterRateLimit 100.0%
- charon/app/log/filter.go:30: defaultFilter 100.0%
- charon/app/log/filter.go:45: Filter 100.0%
- charon/app/log/log.go:32: WithCtx 100.0%
- charon/app/log/log.go:37: CopyFields 100.0%
- charon/app/log/log.go:43: WithTopic 100.0%
- charon/app/log/log.go:49: WithLogger 100.0%
- charon/app/log/log.go:53: fieldsFromCtx 100.0%
- charon/app/log/log.go:58: metricsTopicFromCtx 75.0%
- charon/app/log/log.go:67: getLogger 100.0%
- charon/app/log/log.go:78: Debug 80.0%
- charon/app/log/log.go:89: Info 100.0%
- charon/app/log/log.go:101: Warn 85.7%
- charon/app/log/log.go:127: Error 50.0%
- charon/app/log/log.go:152: unwrapDedup 92.9%
- charon/app/log/log.go:185: errFields 87.5%
- charon/app/log/log.go:208: toAttributes 88.9%
- charon/app/log/loki/batch.go:26: newBatch 75.0%
- charon/app/log/loki/batch.go:39: Add 100.0%
- charon/app/log/loki/batch.go:45: Size 100.0%
- charon/app/log/loki/batch.go:50: Age 100.0%
- charon/app/log/loki/batch.go:56: Encode 75.0%
- charon/app/log/loki/batch.go:71: fmtLabels 83.3%
- charon/app/log/loki/client.go:43: NewForT 100.0%
- charon/app/log/loki/client.go:50: New 0.0%
- charon/app/log/loki/client.go:54: newInternal 100.0%
- charon/app/log/loki/client.go:91: Run 69.2%
- charon/app/log/loki/client.go:154: Add 100.0%
- charon/app/log/loki/client.go:163: Stop 100.0%
- charon/app/log/loki/client.go:173: labelsReady 100.0%
- charon/app/log/loki/client.go:179: labels 100.0%
- charon/app/log/loki/client.go:192: send 60.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:32: Reset 100.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:41: String 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:45: ProtoMessage 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:47: ProtoReflect 85.7%
- charon/app/log/loki/lokipb/v1/loki.pb.go:60: Descriptor 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:64: GetStreams 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:81: Reset 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:90: String 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:94: ProtoMessage 0.0%

- charon/app/log/loki/lokipb/v1/loki.pb.go:96: ProtoReflect 42.9%
- charon/app/log/loki/lokipb/v1/loki.pb.go:109: Descriptor 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:113: GetLabels 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:120: GetEntries 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:127: GetHash 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:143: Reset 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:152: String 100.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:156: ProtoMessage 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:158: ProtoReflect 100.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:171: Descriptor 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:175: GetTimestamp 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:182: GetLine 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:226: file_app_log_loki_lokipb_v1_loki_proto_rawDescGZIP 0.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:251: init 100.0%
- charon/app/log/loki/lokipb/v1/loki.pb.go:252: file_app_log_loki_lokipb_v1_loki_proto_init 29.6%
- charon/app/log/metrics.go:30: incWarnCounter 100.0%
- charon/app/log/metrics.go:34: incErrorCounter 100.0%
- charon/app/log/wrapper.go:17: Debug 0.0%
- charon/app/log/wrapper.go:23: Info 100.0%
- charon/app/log/wrapper.go:29: Warn 0.0%
- charon/app/log/wrapper.go:35: Error 0.0%
- charon/app/log/wrapper.go:46: Write 100.0%
- charon/app/log/wrapper.go:51: Sync 0.0%
- charon/app/log/wrapper.go:55: Core 0.0%
- charon/app/metrics.go:110: initStartupMetrics 0.0%
- charon/app/monitoringapi.go:47: wireMonitoringAPI 0.0%
- charon/app/monitoringapi.go:122: startReadyChecker 93.7%
- charon/app/monitoringapi.go:222: beaconNodeSyncing 75.0%
- charon/app/monitoringapi.go:232: beaconNodeVersionMetric 0.0%
- charon/app/monitoringapi.go:265: quorumPeersConnected 100.0%
- charon/app/monitoringapi.go:281: writeResponse 0.0%
- charon/app/obolapi/api.go:25: New 100.0%
- charon/app/obolapi/api.go:43: url 75.0%
- charon/app/obolapi/api.go:53: PublishLock 81.8%
- charon/app/obolapi/api.go:75: LaunchpadURLForLock 100.0%
- charon/app/obolapi/api.go:83: launchpadURLPath 100.0%
- charon/app/obolapi/api.go:87: httpPost 71.4%
- charon/app/obolapi/exit.go:41: partialExitURL 100.0%
- charon/app/obolapi/exit.go:49: bearerString 100.0%
- charon/app/obolapi/exit.go:54: fullExitURL 100.0%
- charon/app/obolapi/exit.go:66: PostPartialExit 73.3%
- charon/app/obolapi/exit.go:130: GetFullExit 71.2%
- charon/app/obolapi/exit_model.go:40: UnmarshalJSON 77.8%
- charon/app/obolapi/exit_model.go:60: MarshalJSON 100.0%
- charon/app/obolapi/exit_model.go:77: GetTree 75.0%
- charon/app/obolapi/exit_model.go:86: HashTreeRoot 75.0%
- charon/app/obolapi/exit_model.go:95: HashTreeRootWith 83.3%
- charon/app/obolapi/exit_model.go:112: GetTree 75.0%
- charon/app/obolapi/exit_model.go:121: HashTreeRoot 75.0%
- charon/app/obolapi/exit_model.go:130: HashTreeRootWith 85.7%
- charon/app/obolapi/exit_model.go:161: GetTree 75.0%
- charon/app/obolapi/exit_model.go:170: HashTreeRoot 75.0%
- charon/app/obolapi/exit_model.go:179: HashTreeRootWith 85.7%
- charon/app/obolapi/exit_model.go:199: GetTree 75.0%
- charon/app/obolapi/exit_model.go:208: HashTreeRoot 75.0%
- charon/app/obolapi/exit_model.go:217: HashTreeRootWith 77.8%
- charon/app/obolapi/exit_model.go:239: leftPad 66.7%
- charon/app/obolapi/exit_model.go:248: putBytesN 75.0%
- charon/app/obolapi/exit_model.go:260: from0× 62.5%
- charon/app/peerinfo/adhoc.go:19: DoOnce 88.9%
- charon/app/peerinfo/peerinfo.go:35: Protocols 0.0%
- charon/app/peerinfo/peerinfo.go:46: New 84.6%
- charon/app/peerinfo/peerinfo.go:75: NewForT 100.0%
- charon/app/peerinfo/peerinfo.go:85: newInternal 100.0%
- charon/app/peerinfo/peerinfo.go:148: Run 100.0%
- charon/app/peerinfo/peerinfo.go:165: sendOnce 81.2%
- charon/app/peerinfo/peerinfo.go:248: supportedPeerVersion 100.0%
- charon/app/peerinfo/peerinfo.go:270: newMetricsSubmitter 5.0%
- charon/app/peerinfo/peerinfopb/v1/peerinfo.pb.go:37: Reset 100.0%
- charon/app/peerinfo/peerinfopb/v1/peerinfo.pb.go:46: String 0.0%
- charon/app/peerinfo/peerinfopb/v1/peerinfo.pb.go:50: ProtoMessage 0.0%
- charon/app/peerinfo/peerinfopb/v1/peerinfo.pb.go:52: ProtoReflect 85.7%

- charon/app/peerinfo/peerinfopb/v1/peerinfo.pb.go:65: Descriptor 0.0%
- charon/app/peerinfo/peerinfopb/v1/peerinfo.pb.go:69: GetCharonVersion 0.0%
- charon/app/peerinfo/peerinfopb/v1/peerinfo.pb.go:76: GetLockHash 0.0%
- charon/app/peerinfo/peerinfopb/v1/peerinfo.pb.go:83: GetSentAt 0.0%
- charon/app/peerinfo/peerinfopb/v1/peerinfo.pb.go:90: GetGitHash 0.0%
- charon/app/peerinfo/peerinfopb/v1/peerinfo.pb.go:97: GetStartedAt 0.0%
- charon/app/peerinfo/peerinfopb/v1/peerinfo.pb.go:104: GetBuilderApiEnabled 0.0%
- charon/app/peerinfo/peerinfopb/v1/peerinfo.pb.go:151: file_app_peerinfo_peerinfopb_v1_peerinfo_proto_rawDescGZIP 0.0%
- charon/app/peerinfo/peerinfopb/v1/peerinfo.pb.go:173: init 100.0%
- charon/app/peerinfo/peerinfopb/v1/peerinfo.pb.go:174: file_app_peerinfo_peerinfopb_v1_peerinfo_proto_init 56.2%
- charon/app/priorities.go:13: newMutableConfig 0.0%
- charon/app/priorities.go:29: SetInfoSync 0.0%
- charon/app/priorities.go:36: getInfoSync 0.0%
- charon/app/priorities.go:44: BuilderAPI 0.0%
- charon/app/privkeylock/privkeylock.go:23: New 75.0%
- charon/app/privkeylock/privkeylock.go:67: Run 80.0%
- charon/app/privkeylock/privkeylock.go:92: Close 100.0%
- charon/app/privkeylock/privkeylock.go:104: writeFile 66.7%
- charon/app/promauto/promauto.go:38: FQName 0.0%
- charon/app/promauto/promauto.go:44: GetMetasForT 0.0%
- charon/app/promauto/promauto.go:55: NewRegistry 80.0%
- charon/app/promauto/promauto.go:84: cacheMetric 100.0%
- charon/app/promauto/promauto.go:92: NewGaugeVec 100.0%
- charon/app/promauto/promauto.go💯 NewGauge 0.0%
- charon/app/promauto/promauto.go:108: NewHistogramVec 0.0%
- charon/app/promauto/promauto.go:116: NewHistogram 0.0%
- charon/app/promauto/promauto.go:124: NewCounterVec 0.0%
- charon/app/promauto/promauto.go:132: NewCounter 0.0%
- charon/app/promauto/promauto.go:141: makeMeta 100.0%
- charon/app/promauto/resetgauge.go:15: NewResetGaugeVec 100.0%
- charon/app/promauto/resetgauge.go:31: WithLabelValues 85.7%
- charon/app/promauto/resetgauge.go:48: Reset 100.0%
- charon/app/protonil/protonil.go:26: Check 97.8%
- charon/app/protonil/protonil.go:125: valueToMsg 80.0%
- charon/app/qbftdebug.go:22: newQBFTDebugger 0.0%
- charon/app/qbftdebug.go:41: AddInstance 71.4%
- charon/app/qbftdebug.go:68: ServeHTTP 62.5%
- charon/app/qbftdebug.go:83: getZippedProto 71.4%
- charon/app/retry/retry.go:28: New 70.0%
- charon/app/retry/retry.go:51: NewForT 100.0%
- charon/app/retry/retry.go:59: newInternal 100.0%
- charon/app/retry/retry.go:93: DoAsync 89.2%
- charon/app/retry/retry.go:157: startAsync 83.3%
- charon/app/retry/retry.go:171: endAsync 100.0%
- charon/app/retry/retry.go:182: someActive 100.0%
- charon/app/retry/retry.go:190: fmtActive 0.0%
- charon/app/retry/retry.go:198: isShutdown 66.7%
- charon/app/retry/retry.go:208: Shutdown 88.9%
- charon/app/retry/retry.go:229: isTemporaryBeaconErr 57.1%
- charon/app/tracer/trace.go:27: Start 100.0%
- charon/app/tracer/trace.go:33: RootedCtx 0.0%
- charon/app/tracer/trace.go:40: Init 76.9%
- charon/app/tracer/trace.go:73: WithStdOut 83.3%
- charon/app/tracer/trace.go:88: WithJaegerOrNoop 0.0%
- charon/app/tracer/trace.go:97: WithJaegerService 0.0%
- charon/app/tracer/trace.go:104: WithJaeger 0.0%
- charon/app/tracer/trace.go:125: newTraceProvider 100.0%
- charon/app/version/version.go:26: Supported 100.0%
- charon/app/version/version.go:35: GitCommit 0.0%
- charon/app/version/version.go:59: LogInfo 0.0%
- charon/app/version/version.go:87: String 0.0%
- charon/app/version/version.go:98: PreRelease 100.0%
- charon/app/version/version.go:104: Minor 100.0%
- charon/app/version/version.go:118: Compare 80.0%
- charon/app/version/version.go:151: Parse 100.0%
- charon/app/vmock.go:24: wireValidatorMock 0.0%
- charon/app/vmock.go:63: newVMockEth2Provider 0.0%
- charon/app/vmock.go:108: newVMockSigner 0.0%
- charon/app/z/zapfield.go:18: Fields 80.0%
- charon/app/z/zapfield.go:32: ContainsField 100.0%
- charon/app/z/zapfield.go:52: Err 80.0%
- charon/app/z/zapfield.go:77: Str 100.0%

- charon/app/z/zapfield.go:84: Bool 100.0%
- charon/app/z/zapfield.go:91: Int 100.0%
- charon/app/z/zapfield.go:98: Uint 100.0%
- charon/app/z/zapfield.go:105: I64 100.0%
- charon/app/z/zapfield.go:112: U64 100.0%
- charon/app/z/zapfield.go:119: Hex 0.0%
- charon/app/z/zapfield.go:126: F64 100.0%
- charon/app/z/zapfield.go:134: Any 100.0%
- charon/cluster/definition.go:35: WithVersion 100.0%
- charon/cluster/definition.go:42: WithDKGAlgorithm 0.0%
- charon/cluster/definition.go:49: WithLegacyVAddrs 100.0%
- charon/cluster/definition.go:65: NewDefinition 75.0%
- charon/cluster/definition.go:166: NodeIdx 0.0%
- charon/cluster/definition.go:187: VerifySignatures 73.3%
- charon/cluster/definition.go:275: Peers 78.6%
- charon/cluster/definition.go:301: PeerIDs 0.0%
- charon/cluster/definition.go:316: LegacyValidatorAddresses 85.7%
- charon/cluster/definition.go:330: WithdrawalAddresses 0.0%
- charon/cluster/definition.go:340: FeeRecipientAddresses 100.0%
- charon/cluster/definition.go:350: SetDefinitionHashes 88.9%
- charon/cluster/definition.go:370: MarshalJSON 90.0%
- charon/cluster/definition.go:393: UnmarshalJSON 72.0%
- charon/cluster/definition.go:447: VerifyHashes 63.6%
- charon/cluster/definition.go:470: marshalDefinitionV1x0or1 71.4%
- charon/cluster/definition.go:498: marshalDefinitionV1x2or3 71.4%
- charon/cluster/definition.go:526: marshalDefinitionV1x4 71.4%
- charon/cluster/definition.go:558: marshalDefinitionV1x5to7 75.0%
- charon/cluster/definition.go:584: marshalDefinitionV1x8 75.0%
- charon/cluster/definition.go:611: unmarshalDefinitionV1x0or1 75.0%
- charon/cluster/definition.go:649: unmarshalDefinitionV1x2or3 83.3%
- charon/cluster/definition.go:678: unmarshalDefinitionV1x4 80.0%
- charon/cluster/definition.go:709: unmarshalDefinitionV1x5to7 66.7%
- charon/cluster/definition.go:739: unmarshalDefinitionV1x8 62.5%
- charon/cluster/definition.go:776: supportEIP712Sigs 100.0%
- charon/cluster/definition.go:781: supportPartialDeposits 100.0%
- charon/cluster/definition.go:785: eip712SigsPresent 75.0%
- charon/cluster/definition.go:919: validatorAddressesToJSON 100.0%
- charon/cluster/definition.go:929: validatorAddressesFromJSON 100.0%
- charon/cluster/definition.go:939: repeatVAddrs 100.0%
- charon/cluster/deposit.go:31: firstDepositDataOrDefault 66.7%
- charon/cluster/deposit.go:40: depositDataToJSON 100.0%
- charon/cluster/deposit.go:50: depositDataFromJSON 100.0%
- charon/cluster/deposit.go:60: depositDataArrayToJSON 100.0%
- charon/cluster/deposit.go:74: depositDataArrayFromJSON 100.0%
- charon/cluster/distvalidator.go:34: PublicKey 0.0%
- charon/cluster/distvalidator.go:39: PublicKeyHex 0.0%
- charon/cluster/distvalidator.go:44: PublicShare 0.0%
- charon/cluster/distvalidator.go:49: ZeroRegistration 0.0%
- charon/cluster/distvalidator.go:60: Eth2Registration 0.0%
- charon/cluster/distvalidator.go:122: distValidatorsFromV1x1 100.0%
- charon/cluster/distvalidator.go:134: distValidatorsToV1x1 100.0%
- charon/cluster/distvalidator.go:146: distValidatorsFromV1x2to5 100.0%
- charon/cluster/distvalidator.go:162: distValidatorsToV1x2to5 100.0%
- charon/cluster/distvalidator.go:179: distValidatorsFromV1x6 100.0%
- charon/cluster/distvalidator.go:198: distValidatorsToV1x6 100.0%
- charon/cluster/distvalidator.go:216: distValidatorsToV1x7 100.0%
- charon/cluster/distvalidator.go:235: distValidatorsToV1x8OrLater 100.0%
- charon/cluster/distvalidator.go:254: byteSliceArrayToEthHex 100.0%
- charon/cluster/distvalidator.go:263: distValidatorsFromV1x7 100.0%
- charon/cluster/distvalidator.go:284: distValidatorsFromV1x8OrLater 100.0%
- charon/cluster/eip712sigs.go:60: getOperatorEIP712Type 80.0%
- charon/cluster/eip712sigs.go:73: digestEIP712 75.0%
- charon/cluster/eip712sigs.go:106: signEIP712 71.4%
- charon/cluster/helpers.go:29: FetchDefinition 83.3%
- charon/cluster/helpers.go:65: CreateValidatorKeysDir 91.7%
- charon/cluster/helpers.go:86: uuid 100.0%
- charon/cluster/helpers.go:94: verifySig 87.5%
- charon/cluster/helpers.go:111: signCreator 80.0%
- charon/cluster/helpers.go:123: signOperator 75.0%
- charon/cluster/helpers.go:140: aggSign 81.8%
- charon/cluster/helpers.go:164: UnmarshalJSON 75.0%
- charon/cluster/helpers.go:180: MarshalJSON 75.0%

- charon/cluster/helpers.go:191: Threshold 0.0%
- charon/cluster/helpers.go:197: putByteList 85.7%
- charon/cluster/helpers.go:210: putBytesN 75.0%
- charon/cluster/helpers.go:221: putHexBytes20 80.0%
- charon/cluster/helpers.go:233: leftPad 100.0%
- charon/cluster/helpers.go:242: to0xHex 100.0%
- charon/cluster/helpers.go:251: from0xHex 75.0%
- charon/cluster/lock.go:41: MarshalJSON 80.0%
- charon/cluster/lock.go:64: UnmarshalJSON 72.0%
- charon/cluster/lock.go:120: SetLockHash 80.0%
- charon/cluster/lock.go:132: VerifyHashes 62.5%
- charon/cluster/lock.go:151: VerifySignatures 65.4%
- charon/cluster/lock.go:200: verifyNodeSignatures 68.8%
- charon/cluster/lock.go:235: verifyBuilderRegistrations 72.0%
- charon/cluster/lock.go:283: marshalLockV1×0or1 75.0%
- charon/cluster/lock.go:297: marshalLockV1×2to5 75.0%
- charon/cluster/lock.go:311: marshalLockV1×6 75.0%
- charon/cluster/lock.go:325: marshalLockV1×7 75.0%
- charon/cluster/lock.go:340: marshalLockV1×8OrLater 75.0%
- charon/cluster/lock.go:355: unmarshalLockV1×0or1 75.0%
- charon/cluster/lock.go:377: unmarshalLockV1×2to5 75.0%
- charon/cluster/lock.go:399: unmarshalLockV1×6 80.0%
- charon/cluster/lock.go:415: unmarshalLockV1×7 87.5%
- charon/cluster/lock.go:437: unmarshalLockV1×8OrLater 87.5%
- charon/cluster/manifest/cluster.go:19: ClusterPeers 81.2%
- charon/cluster/manifest/cluster.go:49: ClusterPeerIDs 0.0%
- charon/cluster/manifest/cluster.go:63: ClusterNodeIdx 0.0%
- charon/cluster/manifest/cluster.go:84: ValidatorPublicKey 0.0%
- charon/cluster/manifest/cluster.go:89: ValidatorPublicKeyHex 0.0%
- charon/cluster/manifest/cluster.go:94: ValidatorPublicShare 0.0%
- charon/cluster/manifest/helpers.go:30: SetNowFuncForT 100.0%
- charon/cluster/manifest/helpers.go:41: hashSignedMutation 61.5%
- charon/cluster/manifest/helpers.go:72: hashMutation 58.3%
- charon/cluster/manifest/helpers.go:102: verifyEmptySig 60.0%
- charon/cluster/manifest/helpers.go:115: SignK1 71.4%
- charon/cluster/manifest/helpers.go:134: verifyK1SignedMutation 63.6%
- charon/cluster/manifest/helpers.go:155: to0xHex 0.0%
- charon/cluster/manifest/helpers.go:164: from0xHex 62.5%
- charon/cluster/manifest/helpers.go:180: ValidatorToProto 77.8%
- charon/cluster/manifest/load.go:25: LoadCluster 71.4%
- charon/cluster/manifest/load.go:45: LoadDAG 81.8%
- charon/cluster/manifest/load.go:74: loadDAGFromManifest 85.7%
- charon/cluster/manifest/load.go:90: loadDAGFromLegacyLock 69.2%
- charon/cluster/manifest/load.go:117: clusterHashesMatch 77.8%
- charon/cluster/manifest/materialise.go:11: Materialise 71.4%
- charon/cluster/manifest/mutation.go:13: Valid 100.0%
- charon/cluster/manifest/mutation.go:19: String 0.0%
- charon/cluster/manifest/mutation.go:24: Transform 100.0%
- charon/cluster/manifest/mutation.go:47: init 100.0%
- charon/cluster/manifest/mutationaddvalidator.go:15: NewGenValidators 62.5%
- charon/cluster/manifest/mutationaddvalidator.go:40: verifyGenValidators 62.5%
- charon/cluster/manifest/mutationaddvalidator.go:57: transformGenValidators 66.7%
- charon/cluster/manifest/mutationaddvalidator.go:77: NewAddValidators 62.5%
- charon/cluster/manifest/mutationaddvalidator.go:103: transformAddValidators 62.1%
- charon/cluster/manifest/mutationlegacylock.go:19: NewDAGFromLockForT 0.0%
- charon/cluster/manifest/mutationlegacylock.go:29: NewClusterFromLockForT 75.0%
- charon/cluster/manifest/mutationlegacylock.go:39: NewRawLegacyLock 71.4%
- charon/cluster/manifest/mutationlegacylock.go:63: NewLegacyLockForT 66.7%
- charon/cluster/manifest/mutationlegacylock.go:82: verifyLegacyLock 63.6%
- charon/cluster/manifest/mutationlegacylock.go:106: transformLegacyLock 77.3%
- charon/cluster/manifest/mutationlegacylock.go:161: isZeroProto 80.0%
- charon/cluster/manifest/mutationnodeapproval.go:18: SignNodeApproval 66.7%
- charon/cluster/manifest/mutationnodeapproval.go:37: NewNodeApprovalsComposite 71.4%
- charon/cluster/manifest/mutationnodeapproval.go:73: verifyNodeApproval 66.7%
- charon/cluster/manifest/mutationnodeapproval.go:87: transformNodeApprovals 68.0%
- charon/cluster/manifest/types.go:13: Hash 72.7%
- charon/cluster/manifest/types.go:38: Transform 66.7%
- charon/cluster/manifestpb/v1/manifest.pb.go:40: Reset 100.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:49: String 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:53: ProtoMessage 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:55: ProtoReflect 85.7%
- charon/cluster/manifestpb/v1/manifest.pb.go:68: Descriptor 0.0%

- charon/cluster/manifestpb/v1/manifest.pb.go:72: GetInitialMutationHash 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:79: GetLatestMutationHash 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:86: GetName 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:93: GetThreshold 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go💯 GetDkgAlgorithm 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:107: GetForkVersion 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:114: GetOperators 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:121: GetValidators 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:139: Reset 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:148: String 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:152: ProtoMessage 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:154: ProtoReflect 100.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:167: Descriptor 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:171: GetParent 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:178: GetType 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:185: GetData 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:203: Reset 100.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:212: String 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:216: ProtoMessage 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:218: ProtoReflect 100.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:231: Descriptor 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:235: GetMutation 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:242: GetSigner 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:249: GetSignature 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:265: Reset 100.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:274: String 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:278: ProtoMessage 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:280: ProtoReflect 85.7%
- charon/cluster/manifestpb/v1/manifest.pb.go:293: Descriptor 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:297: GetMutations 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:314: Reset 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:323: String 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:327: ProtoMessage 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:329: ProtoReflect 100.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:342: Descriptor 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:346: GetAddress 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:353: GetEnr 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:373: Reset 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:382: String 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:386: ProtoMessage 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:388: ProtoReflect 100.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:401: Descriptor 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:405: GetPublicKey 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:412: GetPubShares 66.7%
- charon/cluster/manifestpb/v1/manifest.pb.go:419: GetFeeRecipientAddress 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:426: GetWithdrawalAddress 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:433: GetBuilderRegistrationJson 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:449: Reset 100.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:458: String 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:462: ProtoMessage 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:464: ProtoReflect 85.7%
- charon/cluster/manifestpb/v1/manifest.pb.go:477: Descriptor 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:481: GetValidators 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:497: Reset 100.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:506: String 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:510: ProtoMessage 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:512: ProtoReflect 85.7%
- charon/cluster/manifestpb/v1/manifest.pb.go:525: Descriptor 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:529: GetJson 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:543: Reset 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:552: String 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:556: ProtoMessage 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:558: ProtoReflect 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:571: Descriptor 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:664: file_cluster_manifestpb_v1_manifest_proto_rawDescGZIP 0.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:698: init 100.0%
- charon/cluster/manifestpb/v1/manifest.pb.go:699: file_cluster_manifestpb_v1_manifest_proto_init 12.7%
- charon/cluster/operator.go:47: operatorsFromV1×1 83.3%
- charon/cluster/operator.go:65: operatorsToV1×1 100.0%
- charon/cluster/operator.go:80: operatorsFromV1×2orLater 100.0%
- charon/cluster/operator.go:94: operatorsToV1×2orLater 100.0%
- charon/cluster/registration.go:38: registrationToJSON 100.0%

- charon/cluster/registration.go:51: registrationFromJSON 100.0%
- charon/cluster/ssz.go:31: getDefinitionHashFunc 100.0%
- charon/cluster/ssz.go:47: hashDefinition 81.8%
- charon/cluster/ssz.go:69: hashDefinitionLegacy 97.2%
- charon/cluster/ssz.go:156: hashDefinitionV1x3or4 79.6%
- charon/cluster/ssz.go:276: hashDefinitionV1x5to7 71.2%
- charon/cluster/ssz.go:402: hashDefinitionV1x8orLater 72.9%
- charon/cluster/ssz.go:541: hashLock 78.6%
- charon/cluster/ssz.go:567: hashLockV1x3orLater 76.5%
- charon/cluster/ssz.go:603: getValidatorHashFunc 85.7%
- charon/cluster/ssz.go:615: hashValidatorPubsharesField 85.7%
- charon/cluster/ssz.go:631: hashValidatorV1x3Or4 85.7%
- charon/cluster/ssz.go:651: hashValidatorV1x5to7 70.0%
- charon/cluster/ssz.go:695: hashValidatorV1x8OrLater 73.9%
- charon/cluster/ssz.go:743: hashLockLegacy 81.8%
- charon/cluster/ssz.go:769: hashValidatorLegacy 100.0%
- charon/cluster/ssz.go:794: getDepositDataHashFunc 87.5%
- charon/cluster/ssz.go:808: getRegistrationHashFunc 83.3%
- charon/cluster/ssz.go:821: hashDepositDataV1x6 66.7%
- charon/cluster/ssz.go:840: hashDepositDataV1x7OrLater 70.0%
- charon/cluster/ssz.go:867: hashBuilderRegistration 71.4%
- charon/cluster/ssz.go:886: hashRegistration 87.5%
- charon/cluster/test_cluster.go:28: NewForT 93.8%
- charon/cluster/test_cluster.go:164: getSignedRegistration 100.0%
- charon/cluster/test_cluster.go:202: RandomRegistration 100.0%
- charon/cluster/test_cluster.go:207: RandomRegistrationSeed 100.0%
- charon/cluster/version.go:38: isAnyVersion 100.0%
- charon/cluster/version.go:48: isV1x3 100.0%
- charon/cluster/version.go:53: SupportedVersionsForT 100.0%
- charon/cluster/version.go:63: SupportPregenRegistrations 0.0%
- charon/cluster/version.go:68: SupportNodeSignatures 0.0%
- charon/cmd/addvalidators.go:64: newAddValidatorsCmd 0.0%
- charon/cmd/addvalidators.go:88: bindAddValidatorsFlags 0.0%
- charon/cmd/addvalidators.go:97: runAddValidatorsSolo 73.2%
- charon/cmd/addvalidators.go:206: builderRegistration 69.2%
- charon/cmd/addvalidators.go:239: writeDepositDatas 77.8%
- charon/cmd/addvalidators.go:296: writeNewKeystores 76.9%
- charon/cmd/addvalidators.go:344: validateConf 94.1%
- charon/cmd/addvalidators.go:387: genNewVals 77.8%
- charon/cmd/addvalidators.go:465: loadDAG 63.6%
- charon/cmd/addvalidators.go:488: getP2PKeys 18.2%
- charon/cmd/addvalidators.go:509: validateP2PKeysOrder 91.7%
- charon/cmd/addvalidators.go:534: repeatAddr 100.0%
- charon/cmd/addvalidators.go:544: hex7 75.0%
- charon/cmd/addvalidators.go:554: printPubkeys 66.7%
- charon/cmd/addvalidators.go:566: shortPubkey 75.0%
- charon/cmd/addvalidators.go:576: randomHex32 80.0%
- charon/cmd/alpha.go:9: newAlphaCmd 0.0%
- charon/cmd/cmd.go:34: New 0.0%
- charon/cmd/cmd.go:55: newRootCmd 100.0%
- charon/cmd/cmd.go:76: silenceUsage 100.0%
- charon/cmd/cmd.go:90: initializeConfig 90.9%
- charon/cmd/cmd.go:116: bindFlags 92.9%
- charon/cmd/cmd.go:150: titledHelp 100.0%
- charon/cmd/cmd.go:161: printFlags 100.0%
- charon/cmd/cmd.go:166: printLicense 100.0%
- charon/cmd/cmd.go:173: flagsToLogFields 100.0%
- charon/cmd/cmd.go:194: redact 100.0%
- charon/cmd/combine.go:15: newCombineCmd 0.0%
- charon/cmd/combine.go:55: newCombineFunc 0.0%
- charon/cmd/combine.go:59: bindCombineFlags 0.0%
- charon/cmd/combine/combine.go:30: Combine 73.6%
- charon/cmd/combine/combine.go:178: shareIdxByPubkeys 84.2%
- charon/cmd/combine/combine.go:218: WithInsecureKeysForT 100.0%
- charon/cmd/combine/combine.go:236: loadManifest 84.0%
- charon/cmd/combine/combine.go:288: verifyLock 88.9%
- charon/cmd/create.go:7: newCreateCmd 100.0%
- charon/cmd/createcluster.go:85: newCreateClusterCmd 0.0%
- charon/cmd/createcluster.go:104: bindClusterFlags 0.0%
- charon/cmd/createcluster.go:127: bindInsecureFlags 0.0%
- charon/cmd/createcluster.go:131: runCreateCluster 78.7%
- charon/cmd/createcluster.go:322: validateCreateConfig 87.5%

- charon/cmd/createcluster.go:373: detectNodeDirs 71.4%
- charon/cmd/createcluster.go:389: signDepositDatas 73.1%
- charon/cmd/createcluster.go:441: signValidatorRegistrations 73.3%
- charon/cmd/createcluster.go:507: getTSSShares 85.7%
- charon/cmd/createcluster.go:537: writeWarning 100.0%
- charon/cmd/createcluster.go:551: getKeys 66.7%
- charon/cmd/createcluster.go:565: generateKeys 85.7%
- charon/cmd/createcluster.go:580: createDepositDatas 66.7%
- charon/cmd/createcluster.go:593: createValidatorRegistrations 66.7%
- charon/cmd/createcluster.go:602: writeLock 77.8%
- charon/cmd/createcluster.go:621: getValidators 87.2%
- charon/cmd/createcluster.go:704: writeKeysToKeymanager 85.2%
- charon/cmd/createcluster.go:754: writeKeysToDisk 69.2%
- charon/cmd/createcluster.go:782: getOperators 88.9%
- charon/cmd/createcluster.go:800: newDefFromConfig 86.4%
- charon/cmd/createcluster.go:838: newPeer 75.0%
- charon/cmd/createcluster.go:855: writeOutput 94.4%
- charon/cmd/createcluster.go:882: nodeDir 100.0%
- charon/cmd/createcluster.go:887: validateDef 80.0%
- charon/cmd/createcluster.go:937: aggSign 81.8%
- charon/cmd/createcluster.go:959: loadDefinition 75.0%
- charon/cmd/createcluster.go:1001: validURI 100.0%
- charon/cmd/createcluster.go:1008: safeThreshold 100.0%
- charon/cmd/createcluster.go:1022: randomHex64 80.0%
- charon/cmd/createcluster.go:1033: writeLockToAPI 71.4%
- charon/cmd/createcluster.go:1049: validateAddresses 100.0%
- charon/cmd/createcluster.go:1075: builderRegistrationFromETH2 69.2%
- charon/cmd/createcluster.go:1108: validateNetworkConfig 87.5%
- charon/cmd/createdkg.go:37: newCreateDKGCmd 100.0%
- charon/cmd/createdkg.go:55: bindCreateDKGFlags 100.0%
- charon/cmd/createdkg.go:72: mustMarkFlagRequired 50.0%
- charon/cmd/createdkg.go:78: runCreateDKG 75.0%
- charon/cmd/createdkg.go:164: validateWithdrawalAddrs 100.0%
- charon/cmd/createdkg.go:183: validateDKGConfig 100.0%
- charon/cmd/createdkg.go:210: isMainOrGnosis 100.0%
- charon/cmd/createenr.go:18: newCreateEnrCmd 100.0%
- charon/cmd/createenr.go:37: runCreateEnrCmd 78.6%
- charon/cmd/createenr.go:64: writeEnrWarning 100.0%
- charon/cmd/debug_tools.go:10: bindDebugMonitoringFlags 100.0%
- charon/cmd/dkg.go:17: newDKGCmd 0.0%
- charon/cmd/dkg.go:52: bindKeymanagerFlags 0.0%
- charon/cmd/dkg.go:57: bindDefDirFlag 0.0%
- charon/cmd/dkg.go:61: bindDataDirFlag 100.0%
- charon/cmd/dkg.go:65: bindPublishFlags 0.0%
- charon/cmd/dkg.go:70: bindShutdownDelayFlag 0.0%
- charon/cmd/enr.go:21: newEnrCmd 0.0%
- charon/cmd/enr.go:44: runNewENR 23.1%
- charon/cmd/enr.go:69: writeExpandedEnr 0.0%
- charon/cmd/enr.go:81: bindEnrFlags 0.0%
- charon/cmd/manifest_tools.go:19: loadClusterManifest 40.0%
- charon/cmd/manifest_tools.go:41: loadDAGFromDisk 0.0%
- charon/cmd/manifest_tools.go:63: writeCluster 80.0%
- charon/cmd/relay.go:15: newRelayCmd 0.0%
- charon/cmd/relay.go:46: bindRelayFlag 0.0%
- charon/cmd/relay/metrics.go:54: newBandwidthCounter 100.0%
- charon/cmd/relay/metrics.go:75: LogSentMessage 0.0%
- charon/cmd/relay/metrics.go:77: LogRecvMessage 0.0%
- charon/cmd/relay/metrics.go:79: LogSentMessageStream 0.0%
- charon/cmd/relay/metrics.go:86: LogRecvMessageStream 0.0%
- charon/cmd/relay/p2p.go:28: startP2P 74.1%
- charon/cmd/relay/p2p.go:76: monitorConnections 20.5%
- charon/cmd/relay/p2p.go:175: getPeerInfo 0.0%
- charon/cmd/relay/p2p.go:194: hex7 100.0%
- charon/cmd/relay/p2p.go:215: Connected 0.0%
- charon/cmd/relay/p2p.go:222: Disconnected 0.0%
- charon/cmd/relay/p2p.go:229: Listen 0.0%
- charon/cmd/relay/p2p.go:231: ListenClose 0.0%
- charon/cmd/relay/relay.go:48: Run 62.3%
- charon/cmd/relay/relay.go:159: newENRHandler 82.6%
- charon/cmd/relay/relay.go:249: newMultiaddrHandler 81.8%
- charon/cmd/relay/relay.go:271: wrapHandler 62.5%
- charon/cmd/run.go:22: newRunCmd 94.7%

- charon/cmd/run.go:61: bindLokiFlags 100.0%
- charon/cmd/run.go:66: bindNoVerifyFlag 100.0%
- charon/cmd/run.go:70: bindRunFlags 100.0%
- charon/cmd/run.go:98: bindUnsafeRunFlags 100.0%
- charon/cmd/run.go:102: bindPrivKeyFlag 100.0%
- charon/cmd/run.go:107: bindLogFlags 100.0%
- charon/cmd/run.go:114: bindP2PFlags 84.6%
- charon/cmd/run.go:137: bindFeatureFlags 100.0%
- charon/cmd/run.go:144: wrapPreRunE 100.0%
- charon/cmd/unsafe.go:7: newUnsafeCmd 100.0%
- charon/cmd/version.go:21: newVersionCmd 100.0%
- charon/cmd/version.go:38: bindVersionFlags 100.0%
- charon/cmd/version.go:42: runVersionCmd 0.0%
- charon/cmd/view_cluster_manifest.go:20: newViewClusterManifestCmd 0.0%
- charon/cmd/view_cluster_manifest.go:38: runViewClusterManifest 66.7%
- charon/cmd/view_cluster_manifest.go:58: protoToJSON 72.7%
- charon/cmd/view_cluster_manifest.go:81: formatMap 85.7%
- charon/cmd/view_cluster_manifest.go:99: formatKey 100.0%
- charon/cmd/view_cluster_manifest.go:118: rawString 100.0%
- charon/cmd/view_cluster_manifest.go:134: formatArray 85.7%
- charon/core/aggsigdb/memory.go:16: NewMemDB 100.0%
- charon/core/aggsigdb/memory.go:44: Store 100.0%
- charon/core/aggsigdb/memory.go:54: store 66.7%
- charon/core/aggsigdb/memory.go:86: Await 100.0%
- charon/core/aggsigdb/memory.go:116: Run 100.0%
- charon/core/aggsigdb/memory.go:142: execCommand 90.9%
- charon/core/aggsigdb/memory.go:162: dataEqual 71.4%
- charon/core/aggsigdb/memory.go:177: execQuery 100.0%
- charon/core/aggsigdb/memory.go:192: processBlockedQueries 85.7%
- charon/core/aggsigdb/memory.go:207: callbackBlockedQueriesForT 100.0%
- charon/core/aggsigdb/memory.go:214: cancelled 100.0%
- charon/core/aggsigdb/memory_v2.go:24: NewMemDBV2 100.0%
- charon/core/aggsigdb/memory_v2.go:34: store 85.7%
- charon/core/aggsigdb/memory_v2.go:59: Store 88.9%
- charon/core/aggsigdb/memory_v2.go:80: Await 100.0%
- charon/core/aggsigdb/memory_v2.go:119: Run 100.0%
- charon/core/bcast/bcast.go:24: New 75.0%
- charon/core/bcast/bcast.go:42: Broadcast 81.0%
- charon/core/bcast/bcast.go:207: setToSyncContributions 85.7%
- charon/core/bcast/bcast.go:222: setToSyncMessages 85.7%
- charon/core/bcast/bcast.go:237: setToAggAndProof 85.7%
- charon/core/bcast/bcast.go:252: setToRegistrations 85.7%
- charon/core/bcast/bcast.go:267: setToOne 60.0%
- charon/core/bcast/bcast.go:280: setToAttestations 85.7%
- charon/core/bcast/bcast.go:294: newDelayFunc 75.0%
- charon/core/bcast/bcast.go:317: firstSlotInCurrentEpoch 76.5%
- charon/core/bcast/metrics.go:53: instrumentDuty 100.0%
- charon/core/bcast/recast.go:31: NewRecaster 0.0%
- charon/core/bcast/recast.go:51: Subscribe 0.0%
- charon/core/bcast/recast.go:59: Store 0.0%
- charon/core/bcast/recast.go:76: store 0.0%
- charon/core/bcast/recast.go:106: SlotTicked 0.0%
- charon/core/bcast/recast.go:162: incRegCounter 0.0%
- charon/core/consensus/component.go:36: Protocols 0.0%
- charon/core/consensus/component.go:43: newDefinition 48.3%
- charon/core/consensus/component.go:130: newInstanceIO 100.0%
- charon/core/consensus/component.go:158: MarkParticipated 0.0%
- charon/core/consensus/component.go:171: MarkProposed 75.0%
- charon/core/consensus/component.go:184: MaybeStart 100.0%
- charon/core/consensus/component.go:196: New 90.9%
- charon/core/consensus/component.go:256: Subscribe 75.0%
- charon/core/consensus/component.go:273: subscribers 100.0%
- charon/core/consensus/component.go:279: SubscribePriority 0.0%
- charon/core/consensus/component.go:291: Start 85.7%
- charon/core/consensus/component.go:312: Propose 75.0%
- charon/core/consensus/component.go:326: ProposePriority 0.0%
- charon/core/consensus/component.go:334: propose 73.7%
- charon/core/consensus/component.go:382: Participate 0.0%
- charon/core/consensus/component.go:407: runInstance 82.4%
- charon/core/consensus/component.go:485: handle 82.8%
- charon/core/consensus/component.go:550: getRecvBuffer 100.0%
- charon/core/consensus/component.go:564: getInstanceIO 100.0%

- charon/core/consensus/component.go:580: deleteInstanceIO 0.0%
- charon/core/consensus/component.go:588: getPeerIdx 100.0%
- charon/core/consensus/component.go:602: verifyMsg 77.8%
- charon/core/consensus/component.go:636: isContextErr 100.0%
- charon/core/consensus/component.go:641: endCtxSpan 100.0%
- charon/core/consensus/component.go:654: groupRoundMessages 100.0%
- charon/core/consensus/component.go:701: timeoutReason 84.6%
- charon/core/consensus/component.go:729: fmtStepPeers 100.0%
- charon/core/consensus/component.go:747: leader 100.0%
- charon/core/consensus/component.go:751: valuesByHash 90.0%
- charon/core/consensus/msg.go:19: newMsg 88.9%
- charon/core/consensus/msg.go:75: Type 100.0%
- charon/core/consensus/msg.go:79: Instance 0.0%
- charon/core/consensus/msg.go:83: Source 100.0%
- charon/core/consensus/msg.go:87: Round 100.0%
- charon/core/consensus/msg.go:91: Value 100.0%
- charon/core/consensus/msg.go:95: PreparedRound 0.0%
- charon/core/consensus/msg.go:99: PreparedValue 100.0%
- charon/core/consensus/msg.go:103: Justification 100.0%
- charon/core/consensus/msg.go:107: ToConsensusMsg 100.0%
- charon/core/consensus/msg.go:122: hashProto 78.6%
- charon/core/consensus/msg.go:150: verifyMsgSig 72.7%
- charon/core/consensus/msg.go:171: signMsg 77.8%
- charon/core/consensus/msg.go:189: toHash32 100.0%
- charon/core/consensus/roundtimer.go:26: getTimerFunc 100.0%
- charon/core/consensus/roundtimer.go:43: Eager 100.0%
- charon/core/consensus/roundtimer.go:54: increasingRoundTimeout 100.0%
- charon/core/consensus/roundtimer.go:59: linearRoundTimeout 100.0%
- charon/core/consensus/roundtimer.go:72: newIncreasingRoundTimer 100.0%
- charon/core/consensus/roundtimer.go:83: Type 100.0%
- charon/core/consensus/roundtimer.go:87: Timer 100.0%
- charon/core/consensus/roundtimer.go:93: newDoubleEagerLinearRoundTimer 100.0%
- charon/core/consensus/roundtimer.go:121: Type 100.0%
- charon/core/consensus/roundtimer.go:125: Timer 100.0%
- charon/core/consensus/transport.go:35: setValues 100.0%
- charon/core/consensus/transport.go:45: getValue 78.6%
- charon/core/consensus/transport.go:76: Broadcast 73.3%
- charon/core/consensus/transport.go:140: ProcessReceives 85.7%
- charon/core/consensus/transport.go:160: createMsg 54.5%
- charon/core/consensus/transport.go:194: newSniffer 100.0%
- charon/core/consensus/transport.go:213: Add 100.0%
- charon/core/consensus/transport.go:224: Instance 100.0%
- charon/core/corepb/v1/consensus.pb.go:40: Reset 0.0%
- charon/core/corepb/v1/consensus.pb.go:49: String 0.0%
- charon/core/corepb/v1/consensus.pb.go:53: ProtoMessage 0.0%
- charon/core/corepb/v1/consensus.pb.go:55: ProtoReflect 100.0%
- charon/core/corepb/v1/consensus.pb.go:68: Descriptor 0.0%
- charon/core/corepb/v1/consensus.pb.go:72: GetType 0.0%
- charon/core/corepb/v1/consensus.pb.go:79: GetDuty 0.0%
- charon/core/corepb/v1/consensus.pb.go:86: GetPeerIdx 0.0%
- charon/core/corepb/v1/consensus.pb.go:93: GetRound 0.0%
- charon/core/corepb/v1/consensus.pb.go💯 GetPreparedRound 0.0%
- charon/core/corepb/v1/consensus.pb.go:107: GetSignature 0.0%
- charon/core/corepb/v1/consensus.pb.go:114: GetValueHash 0.0%
- charon/core/corepb/v1/consensus.pb.go:121: GetPreparedValueHash 0.0%
- charon/core/corepb/v1/consensus.pb.go:138: Reset 100.0%
- charon/core/corepb/v1/consensus.pb.go:147: String 0.0%
- charon/core/corepb/v1/consensus.pb.go:151: ProtoMessage 0.0%
- charon/core/corepb/v1/consensus.pb.go:153: ProtoReflect 100.0%
- charon/core/corepb/v1/consensus.pb.go:166: Descriptor 0.0%
- charon/core/corepb/v1/consensus.pb.go:170: GetMsg 0.0%
- charon/core/corepb/v1/consensus.pb.go:177: GetJustification 0.0%
- charon/core/corepb/v1/consensus.pb.go:184: GetValues 0.0%
- charon/core/corepb/v1/consensus.pb.go:200: Reset 0.0%
- charon/core/corepb/v1/consensus.pb.go:209: String 0.0%
- charon/core/corepb/v1/consensus.pb.go:213: ProtoMessage 0.0%
- charon/core/corepb/v1/consensus.pb.go:215: ProtoReflect 100.0%
- charon/core/corepb/v1/consensus.pb.go:228: Descriptor 0.0%
- charon/core/corepb/v1/consensus.pb.go:232: GetTimestamp 0.0%
- charon/core/corepb/v1/consensus.pb.go:239: GetMsg 0.0%
- charon/core/corepb/v1/consensus.pb.go:257: Reset 0.0%
- charon/core/corepb/v1/consensus.pb.go:266: String 0.0%

- charon/core/corepb/v1/consensus.pb.go:270: ProtoMessage 0.0%
- charon/core/corepb/v1/consensus.pb.go:272: ProtoReflect 100.0%
- charon/core/corepb/v1/consensus.pb.go:285: Descriptor 0.0%
- charon/core/corepb/v1/consensus.pb.go:289: GetStartedAt 0.0%
- charon/core/corepb/v1/consensus.pb.go:296: GetNodes 0.0%
- charon/core/corepb/v1/consensus.pb.go:303: GetPeerIdx 0.0%
- charon/core/corepb/v1/consensus.pb.go:310: GetMsgs 0.0%
- charon/core/corepb/v1/consensus.pb.go:326: Reset 100.0%
- charon/core/corepb/v1/consensus.pb.go:335: String 0.0%
- charon/core/corepb/v1/consensus.pb.go:339: ProtoMessage 0.0%
- charon/core/corepb/v1/consensus.pb.go:341: ProtoReflect 85.7%
- charon/core/corepb/v1/consensus.pb.go:354: Descriptor 0.0%
- charon/core/corepb/v1/consensus.pb.go:358: GetInstances 0.0%
- charon/core/corepb/v1/consensus.pb.go:365: GetGitHash 0.0%
- charon/core/corepb/v1/consensus.pb.go:452: file_core_corepb_v1_consensus_proto_rawDescGZIP 0.0%
- charon/core/corepb/v1/consensus.pb.go:487: init 100.0%
- charon/core/corepb/v1/consensus.pb.go:488: file_core_corepb_v1_consensus_proto_init 22.5%
- charon/core/corepb/v1/core.pb.go:32: Reset 100.0%
- charon/core/corepb/v1/core.pb.go:41: String 0.0%
- charon/core/corepb/v1/core.pb.go:45: ProtoMessage 0.0%
- charon/core/corepb/v1/core.pb.go:47: ProtoReflect 100.0%
- charon/core/corepb/v1/core.pb.go:60: Descriptor 0.0%
- charon/core/corepb/v1/core.pb.go:64: GetSlot 0.0%
- charon/core/corepb/v1/core.pb.go:71: GetType 0.0%
- charon/core/corepb/v1/core.pb.go:86: Reset 100.0%
- charon/core/corepb/v1/core.pb.go:95: String 0.0%
- charon/core/corepb/v1/core.pb.go:99: ProtoMessage 0.0%
- charon/core/corepb/v1/core.pb.go:101: ProtoReflect 85.7%
- charon/core/corepb/v1/core.pb.go:114: Descriptor 0.0%
- charon/core/corepb/v1/core.pb.go:118: GetSet 0.0%
- charon/core/corepb/v1/core.pb.go:133: Reset 100.0%
- charon/core/corepb/v1/core.pb.go:142: String 0.0%
- charon/core/corepb/v1/core.pb.go:146: ProtoMessage 0.0%
- charon/core/corepb/v1/core.pb.go:148: ProtoReflect 100.0%
- charon/core/corepb/v1/core.pb.go:161: Descriptor 0.0%
- charon/core/corepb/v1/core.pb.go:165: GetSet 0.0%
- charon/core/corepb/v1/core.pb.go:182: Reset 100.0%
- charon/core/corepb/v1/core.pb.go:191: String 0.0%
- charon/core/corepb/v1/core.pb.go:195: ProtoMessage 0.0%
- charon/core/corepb/v1/core.pb.go:197: ProtoReflect 100.0%
- charon/core/corepb/v1/core.pb.go:210: Descriptor 0.0%
- charon/core/corepb/v1/core.pb.go:214: GetData 0.0%
- charon/core/corepb/v1/core.pb.go:221: GetSignature 0.0%
- charon/core/corepb/v1/core.pb.go:228: GetShareIdx 0.0%
- charon/core/corepb/v1/core.pb.go:280: file_core_corepb_v1_core_proto_rawDescGZIP 0.0%
- charon/core/corepb/v1/core.pb.go:307: init 100.0%
- charon/core/corepb/v1/core.pb.go:308: file_core_corepb_v1_core_proto_init 27.3%
- charon/core/corepb/v1/parsigex.pb.go:32: Reset 100.0%
- charon/core/corepb/v1/parsigex.pb.go:41: String 0.0%
- charon/core/corepb/v1/parsigex.pb.go:45: ProtoMessage 0.0%
- charon/core/corepb/v1/parsigex.pb.go:47: ProtoReflect 85.7%
- charon/core/corepb/v1/parsigex.pb.go:60: Descriptor 0.0%
- charon/core/corepb/v1/parsigex.pb.go:64: GetDuty 0.0%
- charon/core/corepb/v1/parsigex.pb.go:71: GetDataSet 0.0%
- charon/core/corepb/v1/parsigex.pb.go:104: file_core_corepb_v1_parsigex_proto_rawDescGZIP 0.0%
- charon/core/corepb/v1/parsigex.pb.go:127: init 100.0%
- charon/core/corepb/v1/parsigex.pb.go:128: file_core_corepb_v1_parsigex_proto_init 56.2%
- charon/core/corepb/v1/priority.pb.go:34: Reset 0.0%
- charon/core/corepb/v1/priority.pb.go:43: String 0.0%
- charon/core/corepb/v1/priority.pb.go:47: ProtoMessage 0.0%
- charon/core/corepb/v1/priority.pb.go:49: ProtoReflect 0.0%
- charon/core/corepb/v1/priority.pb.go:62: Descriptor 0.0%
- charon/core/corepb/v1/priority.pb.go:66: GetMsgs 0.0%
- charon/core/corepb/v1/priority.pb.go:73: GetTopics 0.0%
- charon/core/corepb/v1/priority.pb.go:92: Reset 100.0%
- charon/core/corepb/v1/priority.pb.go:101: String 0.0%
- charon/core/corepb/v1/priority.pb.go:105: ProtoMessage 0.0%
- charon/core/corepb/v1/priority.pb.go:107: ProtoReflect 85.7%
- charon/core/corepb/v1/priority.pb.go:120: Descriptor 0.0%
- charon/core/corepb/v1/priority.pb.go:124: GetDuty 0.0%
- charon/core/corepb/v1/priority.pb.go:131: GetTopics 0.0%
- charon/core/corepb/v1/priority.pb.go:138: GetPeerId 0.0%

- charon/core/corepb/v1/priority.pb.go:145: GetSignature 0.0%
- charon/core/corepb/v1/priority.pb.go:162: Reset 0.0%
- charon/core/corepb/v1/priority.pb.go:171: String 0.0%
- charon/core/corepb/v1/priority.pb.go:175: ProtoMessage 0.0%
- charon/core/corepb/v1/priority.pb.go:177: ProtoReflect 100.0%
- charon/core/corepb/v1/priority.pb.go:190: Descriptor 0.0%
- charon/core/corepb/v1/priority.pb.go:194: GetTopic 0.0%
- charon/core/corepb/v1/priority.pb.go:201: GetPriorities 0.0%
- charon/core/corepb/v1/priority.pb.go:220: Reset 0.0%
- charon/core/corepb/v1/priority.pb.go:229: String 0.0%
- charon/core/corepb/v1/priority.pb.go:233: ProtoMessage 0.0%
- charon/core/corepb/v1/priority.pb.go:235: ProtoReflect 85.7%
- charon/core/corepb/v1/priority.pb.go:248: Descriptor 0.0%
- charon/core/corepb/v1/priority.pb.go:252: GetTopic 0.0%
- charon/core/corepb/v1/priority.pb.go:259: GetPriorities 0.0%
- charon/core/corepb/v1/priority.pb.go:276: Reset 0.0%
- charon/core/corepb/v1/priority.pb.go:285: String 0.0%
- charon/core/corepb/v1/priority.pb.go:289: ProtoMessage 0.0%
- charon/core/corepb/v1/priority.pb.go:291: ProtoReflect 100.0%
- charon/core/corepb/v1/priority.pb.go:304: Descriptor 0.0%
- charon/core/corepb/v1/priority.pb.go:308: GetPriority 0.0%
- charon/core/corepb/v1/priority.pb.go:315: GetScore 0.0%
- charon/core/corepb/v1/priority.pb.go:384: file_core_corepb_v1_priority_proto_rawDescGZIP 0.0%
- charon/core/corepb/v1/priority.pb.go:418: init 100.0%
- charon/core/corepb/v1/priority.pb.go:419: file_core_corepb_v1_priority_proto_init 22.5%
- charon/core/deadline.go:56: NewDeadlinerForT 100.0%
- charon/core/deadline.go:66: NewDeadliner 0.0%
- charon/core/deadline.go:71: newDeadliner 100.0%
- charon/core/deadline.go:89: run 86.2%
- charon/core/deadline.go:152: Add 66.7%
- charon/core/deadline.go:170: C 100.0%
- charon/core/deadline.go:175: getCurrDuty 90.0%
- charon/core/deadline.go:196: NewDutyDeadlineFunc 0.0%
- charon/core/dutydb/memory.go:19: NewMemDB 100.0%
- charon/core/dutydb/memory.go:70: Shutdown 100.0%
- charon/core/dutydb/memory.go:75: Store 84.4%
- charon/core/dutydb/memory.go:158: AwaitProposal 90.9%
- charon/core/dutydb/memory.go:183: AwaitBlindedProposal 90.9%
- charon/core/dutydb/memory.go:208: AwaitAttestation 90.9%
- charon/core/dutydb/memory.go:237: AwaitAggAttestation 82.4%
- charon/core/dutydb/memory.go:277: AwaitSyncContribution 90.9%
- charon/core/dutydb/memory.go:306: PubKeyByAttestation 100.0%
- charon/core/dutydb/memory.go:325: storeAttestationUnsafe 77.8%
- charon/core/dutydb/memory.go:369: storeAggAttestationUnsafe 52.2%
- charon/core/dutydb/memory.go:415: storeSyncContributionUnsafe 84.2%
- charon/core/dutydb/memory.go:455: storeProposalUnsafe 75.0%
- charon/core/dutydb/memory.go:493: storeBlindedBeaconBlockUnsafe 75.0%
- charon/core/dutydb/memory.go:532: resolveAttQueriesUnsafe 100.0%
- charon/core/dutydb/memory.go:553: resolveProQueriesUnsafe 100.0%
- charon/core/dutydb/memory.go:574: resolveAggQueriesUnsafe 100.0%
- charon/core/dutydb/memory.go:595: resolveBuilderProQueriesUnsafe 100.0%
- charon/core/dutydb/memory.go:616: resolveContribQueriesUnsafe 100.0%
- charon/core/dutydb/memory.go:636: deleteDutyUnsafe 40.0%
- charon/core/dutydb/memory.go:727: cancelled 100.0%
- charon/core/dutydefinition.go:18: NewAttesterDefinition 0.0%
- charon/core/dutydefinition.go:28: Clone 0.0%
- charon/core/dutydefinition.go:38: MarshalJSON 0.0%
- charon/core/dutydefinition.go:43: NewProposerDefinition 0.0%
- charon/core/dutydefinition.go:53: Clone 0.0%
- charon/core/dutydefinition.go:63: MarshalJSON 0.0%
- charon/core/dutydefinition.go:68: NewSyncCommitteeDefinition 0.0%
- charon/core/dutydefinition.go:78: Clone 0.0%
- charon/core/dutydefinition.go:88: MarshalJSON 0.0%
- charon/core/eth2signeddata.go:31: VerifyEth2SignedData 71.4%
- charon/core/eth2signeddata.go:47: DomainName 100.0%
- charon/core/eth2signeddata.go:51: Epoch 75.0%
- charon/core/eth2signeddata.go:62: DomainName 100.0%
- charon/core/eth2signeddata.go:66: Epoch 75.0%
- charon/core/eth2signeddata.go:77: DomainName 100.0%
- charon/core/eth2signeddata.go:81: Epoch 100.0%
- charon/core/eth2signeddata.go:87: DomainName 100.0%
- charon/core/eth2signeddata.go:91: Epoch 100.0%

- charon/core/eth2signeddata.go:97: DomainName 100.0%
- charon/core/eth2signeddata.go:101: Epoch 100.0%
- charon/core/eth2signeddata.go:108: DomainName 100.0%
- charon/core/eth2signeddata.go:112: Epoch 100.0%
- charon/core/eth2signeddata.go:118: DomainName 100.0%
- charon/core/eth2signeddata.go:122: Epoch 100.0%
- charon/core/eth2signeddata.go:128: DomainName 100.0%
- charon/core/eth2signeddata.go:132: Epoch 100.0%
- charon/core/eth2signeddata.go:138: DomainName 100.0%
- charon/core/eth2signeddata.go:142: Epoch 100.0%
- charon/core/eth2signeddata.go:148: DomainName 100.0%
- charon/core/eth2signeddata.go:152: Epoch 100.0%
- charon/core/eth2signeddata.go:158: DomainName 100.0%
- charon/core/eth2signeddata.go:162: Epoch 100.0%
- charon/core/fetcher/fetcher.go:24: New 100.0%
- charon/core/fetcher/fetcher.go:42: Subscribe 100.0%
- charon/core/fetcher/fetcher.go:47: Fetch 82.8%
- charon/core/fetcher/fetcher.go:103: RegisterAggSigDB 100.0%
- charon/core/fetcher/fetcher.go:109: RegisterAwaitAttData 100.0%
- charon/core/fetcher/fetcher.go:114: fetchAttesterData 85.0%
- charon/core/fetcher/fetcher.go:158: fetchAggregatorData 82.1%
- charon/core/fetcher/fetcher.go:237: fetchProposerData 85.7%
- charon/core/fetcher/fetcher.go:279: fetchBuilderProposerData 85.7%
- charon/core/fetcher/fetcher.go:324: fetchContributionData 81.2%
- charon/core/fetcher/fetcher.go:390: verifyFeeRecipient 50.0%
- charon/core/fetcher/fetcher.go:412: verifyFeeRecipientBlinded 50.0%
- charon/core/gater.go:26: WithDutyGaterForT 100.0%
- charon/core/gater.go:39: NewDutyGater 81.8%
- charon/core/infosync/infosync.go:31: New 0.0%
- charon/core/infosync/infosync.go:89: Protocols 0.0%
- charon/core/infosync/infosync.go:108: Proposals 0.0%
- charon/core/infosync/infosync.go:126: addResult 0.0%
- charon/core/infosync/infosync.go:143: Trigger 0.0%
- charon/core/infosync/infosync.go:160: versionsToStrings 0.0%
- charon/core/infosync/infosync.go:170: protocolsToStrings 0.0%
- charon/core/infosync/infosync.go:180: proposalsToStrings 0.0%
- charon/core/infosync/infosync.go:198: Equal 0.0%
- charon/core/interfaces.go:254: Wire 0.0%
- charon/core/parsigdb/memory.go:18: NewMemDB 100.0%
- charon/core/parsigdb/memory.go:42: SubscribeInternal 0.0%
- charon/core/parsigdb/memory.go:50: SubscribeThreshold 100.0%
- charon/core/parsigdb/memory.go:57: StoreInternal 0.0%
- charon/core/parsigdb/memory.go:80: StoreExternal 77.3%
- charon/core/parsigdb/memory.go:127: Trim 87.5%
- charon/core/parsigdb/memory.go:145: store 55.6%
- charon/core/parsigdb/memory.go:180: clone 90.0%
- charon/core/parsigdb/memory.go:198: getThresholdMatching 85.7%
- charon/core/parsigdb/memory.go:227: parSignedDataEqual 0.0%
- charon/core/parsigex/memory.go:17: NewMemExFunc 85.7%
- charon/core/parsigex/memory.go:79: Broadcast 80.0%
- charon/core/parsigex/memory.go:92: Subscribe 100.0%
- charon/core/parsigex/parsigex.go:26: Protocols 0.0%
- charon/core/parsigex/parsigex.go:30: NewParSigEx 100.0%
- charon/core/parsigex/parsigex.go:61: handle 72.7%
- charon/core/parsigex/parsigex.go:105: Broadcast 81.8%
- charon/core/parsigex/parsigex.go:134: Subscribe 100.0%
- charon/core/parsigex/parsigex.go:139: NewEth2Verifier 78.6%
- charon/core/priority/calculate.go:25: calculateResult 89.2%
- charon/core/priority/calculate.go:102: orderTopicResults 92.9%
- charon/core/priority/calculate.go:135: sortInput 100.0%
- charon/core/priority/calculate.go:150: validateMsgs 70.4%
- charon/core/priority/calculate.go:197: newDeduper 83.3%
- charon/core/priority/component.go:37: PrioritiesOnly 0.0%
- charon/core/priority/component.go:59: NewComponent 0.0%
- charon/core/priority/component.go:91: Start 0.0%
- charon/core/priority/component.go:96: Subscribe 0.0%
- charon/core/priority/component.go:113: Prioritise 0.0%
- charon/core/priority/component.go:153: signMsg 0.0%
- charon/core/priority/component.go:171: verifyMsgSig 0.0%
- charon/core/priority/component.go:196: newMsgVerifier 0.0%
- charon/core/priority/component.go:229: topicProposalToProto 0.0%
- charon/core/priority/component.go:252: topicResultFromProto 0.0%

- charon/core/priority/prioritiser.go:42: Protocols 100.0%
- charon/core/priority/prioritiser.go:70: NewForT 100.0%
- charon/core/priority/prioritiser.go:80: newInternal 89.5%
- charon/core/priority/prioritiser.go:163: Start 0.0%
- charon/core/priority/prioritiser.go:179: Subscribe 100.0%
- charon/core/priority/prioritiser.go:184: Prioritise 66.7%
- charon/core/priority/prioritiser.go:198: handleRequest 63.2%
- charon/core/priority/prioritiser.go:242: getReqBuffer 100.0%
- charon/core/priority/prioritiser.go:256: deleteRecvBuffer 0.0%
- charon/core/priority/prioritiser.go:265: runInstance 67.9%
- charon/core/priority/prioritiser.go:326: exchange 73.3%
- charon/core/priority/prioritiser.go:361: startConsensus 75.0%
- charon/core/priority/prioritiser.go:380: hashProto 83.3%
- charon/core/proto.go:23: DisableSSZMarshallingForT 100.0%
- charon/core/proto.go:32: DutyToProto 100.0%
- charon/core/proto.go:40: DutyFromProto 100.0%
- charon/core/proto.go:48: ParSignedDataFromProto 69.0%
- charon/core/proto.go:147: ParSignedDataToProto 75.0%
- charon/core/proto.go:161: ParSignedDataSetToProto 85.7%
- charon/core/proto.go:177: ParSignedDataSetFromProto 87.5%
- charon/core/proto.go:197: UnsignedDataSetToProto 85.7%
- charon/core/proto.go:213: UnsignedDataSetFromProto 88.9%
- charon/core/proto.go:231: marshal 77.8%
- charon/core/proto.go:253: unmarshal 75.0%
- charon/core/qbft/qbft.go:55: Quorum 100.0%
- charon/core/qbft/qbft.go:61: Faulty 100.0%
- charon/core/qbft/qbft.go:81: Valid 0.0%
- charon/core/qbft/qbft.go:85: String 100.0%
- charon/core/qbft/qbft.go:121: String 100.0%
- charon/core/qbft/qbft.go:156: InputValue 100.0%
- charon/core/qbft/qbft.go:166: Run 90.2%
- charon/core/qbft/qbft.go:385: extractRoundMsgs 100.0%
- charon/core/qbft/qbft.go:399: classify 93.8%
- charon/core/qbft/qbft.go:476: nextMinRound 72.7%
- charon/core/qbft/qbft.go:501: isJustified 85.7%
- charon/core/qbft/qbft.go:520: isJustifiedRoundChange 70.0%
- charon/core/qbft/qbft.go:562: isJustifiedDecided 80.0%
- charon/core/qbft/qbft.go:574: isJustifiedPrePrepare 91.7%
- charon/core/qbft/qbft.go:601: containsJustifiedQrc 90.0%
- charon/core/qbft/qbft.go:648: getSingleJustifiedPrPv 84.6%
- charon/core/qbft/qbft.go:675: getJustifiedQrc 87.5%
- charon/core/qbft/qbft.go:715: getFPlus1RoundChanges 94.1%
- charon/core/qbft/qbft.go:755: getPrepareQuorums 94.7%
- charon/core/qbft/qbft.go:789: quorumNullPrepared 100.0%
- charon/core/qbft/qbft.go:800: filterByRoundAndValue 100.0%
- charon/core/qbft/qbft.go:805: filterRoundChange 100.0%
- charon/core/qbft/qbft.go:811: filterMsgs 93.3%
- charon/core/qbft/qbft.go:846: zeroVal 100.0%
- charon/core/qbft/qbft.go:852: isZeroVal 100.0%
- charon/core/qbft/qbft.go:858: flatten 88.9%
- charon/core/qbft/qbft.go:876: uniqSource 70.0%
- charon/core/retry.go:12: WithAsyncRetry 0.0%
- charon/core/scheduler/metrics.go:68: instrumentSlot 100.0%
- charon/core/scheduler/metrics.go:74: instrumentDuty 100.0%
- charon/core/scheduler/metrics.go:79: newMetricSubmitter 100.0%
- charon/core/scheduler/offset.go:19: fraction 100.0%
- charon/core/scheduler/scheduler.go:31: NewForT 100.0%
- charon/core/scheduler/scheduler.go:46: New 50.0%
- charon/core/scheduler/scheduler.go:81: SubscribeDuties 100.0%
- charon/core/scheduler/scheduler.go:88: SubscribeSlots 0.0%
- charon/core/scheduler/scheduler.go:92: Stop 100.0%
- charon/core/scheduler/scheduler.go:97: Run 93.3%
- charon/core/scheduler/scheduler.go:129: emitCoreSlot 16.7%
- charon/core/scheduler/scheduler.go:143: GetDutyDefinition 87.5%
- charon/core/scheduler/scheduler.go:175: scheduleSlot 85.2%
- charon/core/scheduler/scheduler.go:230: delaySlotOffset 100.0%
- charon/core/scheduler/scheduler.go:249: resolveDuties 85.0%
- charon/core/scheduler/scheduler.go:286: resolveAttDuties 81.8%
- charon/core/scheduler/scheduler.go:365: resolveProDuties 80.0%
- charon/core/scheduler/scheduler.go:423: resolveSyncCommDuties 81.8%
- charon/core/scheduler/scheduler.go:477: getDutyDefinitionSet 100.0%
- charon/core/scheduler/scheduler.go:487: setDutyDefinition 100.0%

- charon/core/scheduler/scheduler.go:506: getResolvedEpoch 100.0%
- charon/core/scheduler/scheduler.go:513: setResolvedEpoch 100.0%
- charon/core/scheduler/scheduler.go:521: isEpochResolved 100.0%
- charon/core/scheduler/scheduler.go:530: isEpochTrimmed 66.7%
- charon/core/scheduler/scheduler.go:539: trimDuties 100.0%
- charon/core/scheduler/scheduler.go:557: newSlotTicker 75.8%
- charon/core/scheduler/scheduler.go:626: resolveActiveValidators 78.3%
- charon/core/scheduler/scheduler.go:678: waitChainStart 100.0%
- charon/core/scheduler/scheduler.go:703: waitBeaconSync 100.0%
- charon/core/scheduler/scheduler.go:736: PubKeyFromIndex 75.0%
- charon/core/scheduler/scheduler.go:747: Indexes 100.0%
- charon/core/sigagg/sigagg.go:23: New 100.0%
- charon/core/sigagg/sigagg.go:43: Subscribe 100.0%
- charon/core/sigagg/sigagg.go:48: Aggregate 82.4%
- charon/core/sigagg/sigagg.go:84: aggregate 81.0%
- charon/core/sigagg/sigagg.go:125: NewVerifier 72.7%
- charon/core/signeddata.go:61: SigFromETH2 100.0%
- charon/core/signeddata.go:69: NewPartialSignature 0.0%
- charon/core/signeddata.go:79: MessageRoot 0.0%
- charon/core/signeddata.go:83: Clone 0.0%
- charon/core/signeddata.go:89: clone 0.0%
- charon/core/signeddata.go:96: Signature 0.0%
- charon/core/signeddata.go💯 SetSignature 0.0%
- charon/core/signeddata.go:104: MarshalJSON 75.0%
- charon/core/signeddata.go:113: UnmarshalJSON 80.0%
- charon/core/signeddata.go:125: ToETH2 100.0%
- charon/core/signeddata.go:133: NewVersionedSignedProposal 0.0%
- charon/core/signeddata.go:163: NewPartialVersionedSignedProposal 0.0%
- charon/core/signeddata.go:180: Signature 71.4%
- charon/core/signeddata.go:198: SetSignature 45.5%
- charon/core/signeddata.go:223: MessageRoot 28.6%
- charon/core/signeddata.go:241: Clone 0.0%
- charon/core/signeddata.go:247: clone 80.0%
- charon/core/signeddata.go:257: MarshalJSON 66.7%
- charon/core/signeddata.go:296: UnmarshalJSON 53.6%
- charon/core/signeddata.go:344: NewVersionedSignedBlindedProposal 0.0%
- charon/core/signeddata.go:366: NewPartialVersionedSignedBlindedProposal 0.0%
- charon/core/signeddata.go:383: Signature 80.0%
- charon/core/signeddata.go:397: SetSignature 77.8%
- charon/core/signeddata.go:418: MessageRoot 80.0%
- charon/core/signeddata.go:432: Clone 0.0%
- charon/core/signeddata.go:438: clone 80.0%
- charon/core/signeddata.go:448: MarshalJSON 75.0%
- charon/core/signeddata.go:483: UnmarshalJSON 75.0%
- charon/core/signeddata.go:525: NewAttestation 100.0%
- charon/core/signeddata.go:530: NewPartialAttestation 0.0%
- charon/core/signeddata.go:542: MessageRoot 100.0%
- charon/core/signeddata.go:546: Clone 0.0%
- charon/core/signeddata.go:553: clone 80.0%
- charon/core/signeddata.go:563: Signature 100.0%
- charon/core/signeddata.go:567: SetSignature 80.0%
- charon/core/signeddata.go:578: MarshalJSON 100.0%
- charon/core/signeddata.go:582: UnmarshalJSON 100.0%
- charon/core/signeddata.go:586: MarshalSSZ 100.0%
- charon/core/signeddata.go:590: MarshalSSZTo 100.0%
- charon/core/signeddata.go:594: SizeSSZ 100.0%
- charon/core/signeddata.go:598: UnmarshalSSZ 100.0%
- charon/core/signeddata.go:603: NewSignedVoluntaryExit 100.0%
- charon/core/signeddata.go:608: NewPartialSignedVoluntaryExit 0.0%
- charon/core/signeddata.go:619: MessageRoot 100.0%
- charon/core/signeddata.go:623: Clone 0.0%
- charon/core/signeddata.go:629: clone 80.0%
- charon/core/signeddata.go:639: Signature 100.0%
- charon/core/signeddata.go:643: SetSignature 80.0%
- charon/core/signeddata.go:654: MarshalJSON 100.0%
- charon/core/signeddata.go:658: UnmarshalJSON 100.0%
- charon/core/signeddata.go:669: NewVersionedSignedValidatorRegistration 0.0%
- charon/core/signeddata.go:683: NewPartialVersionedSignedValidatorRegistration 0.0%
- charon/core/signeddata.go:700: MessageRoot 66.7%
- charon/core/signeddata.go:709: Clone 0.0%
- charon/core/signeddata.go:716: clone 80.0%
- charon/core/signeddata.go:726: Signature 66.7%

- charon/core/signeddata.go:735: SetSignature 71.4%
- charon/core/signeddata.go:751: MarshalJSON 71.4%
- charon/core/signeddata.go:781: UnmarshalJSON 75.0%
- charon/core/signeddata.go:805: NewSignedRandao 0.0%
- charon/core/signeddata.go:815: NewPartialSignedRandao 0.0%
- charon/core/signeddata.go:830: MessageRoot 100.0%
- charon/core/signeddata.go:834: Signature 100.0%
- charon/core/signeddata.go:838: SetSignature 80.0%
- charon/core/signeddata.go:849: Clone 0.0%
- charon/core/signeddata.go:853: MarshalJSON 100.0%
- charon/core/signeddata.go:857: UnmarshalJSON 100.0%
- charon/core/signeddata.go:861: clone 80.0%
- charon/core/signeddata.go:872: NewBeaconCommitteeSelection 100.0%
- charon/core/signeddata.go:879: NewPartialSignedBeaconCommitteeSelection 0.0%
- charon/core/signeddata.go:891: MessageRoot 100.0%
- charon/core/signeddata.go:895: Signature 100.0%
- charon/core/signeddata.go:899: SetSignature 80.0%
- charon/core/signeddata.go:910: Clone 0.0%
- charon/core/signeddata.go:914: clone 80.0%
- charon/core/signeddata.go:924: MarshalJSON 100.0%
- charon/core/signeddata.go:928: UnmarshalJSON 100.0%
- charon/core/signeddata.go:933: NewSyncCommitteeSelection 100.0%
- charon/core/signeddata.go:940: NewPartialSignedSyncCommitteeSelection 0.0%
- charon/core/signeddata.go:954: MessageRoot 100.0%
- charon/core/signeddata.go:963: Signature 100.0%
- charon/core/signeddata.go:967: SetSignature 80.0%
- charon/core/signeddata.go:978: Clone 0.0%
- charon/core/signeddata.go:982: clone 80.0%
- charon/core/signeddata.go:992: MarshalJSON 100.0%
- charon/core/signeddata.go:996: UnmarshalJSON 100.0%
- charon/core/signeddata.go:1001: NewSignedAggregateAndProof 100.0%
- charon/core/signeddata.go:1006: NewPartialSignedAggregateAndProof 0.0%
- charon/core/signeddata.go:1018: MessageRoot 100.0%
- charon/core/signeddata.go:1022: Signature 100.0%
- charon/core/signeddata.go:1026: SetSignature 80.0%
- charon/core/signeddata.go:1037: Clone 0.0%
- charon/core/signeddata.go:1041: clone 80.0%
- charon/core/signeddata.go:1051: MarshalJSON 100.0%
- charon/core/signeddata.go:1055: UnmarshalJSON 100.0%
- charon/core/signeddata.go:1059: MarshalSSZ 100.0%
- charon/core/signeddata.go:1063: MarshalSSZTo 100.0%
- charon/core/signeddata.go:1067: SizeSSZ 100.0%
- charon/core/signeddata.go:1071: UnmarshalSSZ 100.0%
- charon/core/signeddata.go:1078: NewSignedSyncMessage 100.0%
- charon/core/signeddata.go:1083: NewPartialSignedSyncMessage 0.0%
- charon/core/signeddata.go:1095: MessageRoot 100.0%
- charon/core/signeddata.go:1099: Signature 100.0%
- charon/core/signeddata.go:1103: SetSignature 80.0%
- charon/core/signeddata.go:1114: Clone 0.0%
- charon/core/signeddata.go:1118: clone 80.0%
- charon/core/signeddata.go:1128: MarshalJSON 100.0%
- charon/core/signeddata.go:1132: UnmarshalJSON 100.0%
- charon/core/signeddata.go:1136: MarshalSSZ 100.0%
- charon/core/signeddata.go:1140: MarshalSSZTo 100.0%
- charon/core/signeddata.go:1144: SizeSSZ 100.0%
- charon/core/signeddata.go:1148: UnmarshalSSZ 100.0%
- charon/core/signeddata.go:1155: NewSyncContributionAndProof 0.0%
- charon/core/signeddata.go:1160: NewPartialSyncContributionAndProof 0.0%
- charon/core/signeddata.go:1174: MessageRoot 0.0%
- charon/core/signeddata.go:1183: Signature 0.0%
- charon/core/signeddata.go:1187: SetSignature 0.0%
- charon/core/signeddata.go:1198: Clone 0.0%
- charon/core/signeddata.go:1202: clone 0.0%
- charon/core/signeddata.go:1212: MarshalJSON 100.0%
- charon/core/signeddata.go:1216: UnmarshalJSON 100.0%
- charon/core/signeddata.go:1220: DomainName 0.0%
- charon/core/signeddata.go:1224: Epoch 0.0%
- charon/core/signeddata.go:1228: MarshalSSZ 100.0%
- charon/core/signeddata.go:1232: MarshalSSZTo 100.0%
- charon/core/signeddata.go:1236: SizeSSZ 100.0%
- charon/core/signeddata.go:1240: UnmarshalSSZ 100.0%
- charon/core/signeddata.go:1247: NewSignedSyncContributionAndProof 100.0%

- charon/core/signeddata.go:1252: NewPartialSignedSyncContributionAndProof 0.0%
- charon/core/signeddata.go:1266: MessageRoot 100.0%
- charon/core/signeddata.go:1270: Signature 100.0%
- charon/core/signeddata.go:1274: SetSignature 80.0%
- charon/core/signeddata.go:1285: Clone 0.0%
- charon/core/signeddata.go:1289: clone 80.0%
- charon/core/signeddata.go:1299: MarshalJSON 100.0%
- charon/core/signeddata.go:1303: UnmarshalJSON 100.0%
- charon/core/signeddata.go:1307: MarshalSSZ 100.0%
- charon/core/signeddata.go:1311: MarshalSSZTo 100.0%
- charon/core/signeddata.go:1315: SizeSSZ 100.0%
- charon/core/signeddata.go:1319: UnmarshalSSZ 100.0%
- charon/core/signeddata.go:1325: cloneJSONMarshaler 66.7%
- charon/core/ssz.go:33: MarshalSSZ 75.0%
- charon/core/ssz.go:43: MarshalSSZTo 75.0%
- charon/core/ssz.go:53: UnmarshalSSZ 100.0%
- charon/core/ssz.go:65: SizeSSZ 71.4%
- charon/core/ssz.go:82: sszValFromVersion 94.1%
- charon/core/ssz.go:122: MarshalSSZ 75.0%
- charon/core/ssz.go:132: MarshalSSZTo 75.0%
- charon/core/ssz.go:142: UnmarshalSSZ 100.0%
- charon/core/ssz.go:154: SizeSSZ 71.4%
- charon/core/ssz.go:171: sszValFromVersion 58.8%
- charon/core/ssz.go:211: MarshalSSZ 75.0%
- charon/core/ssz.go:221: MarshalSSZTo 75.0%
- charon/core/ssz.go:231: UnmarshalSSZ 100.0%
- charon/core/ssz.go:243: SizeSSZ 71.4%
- charon/core/ssz.go:260: sszValFromVersion 90.9%
- charon/core/ssz.go:288: MarshalSSZ 75.0%
- charon/core/ssz.go:298: MarshalSSZTo 75.0%
- charon/core/ssz.go:308: UnmarshalSSZ 100.0%
- charon/core/ssz.go:320: SizeSSZ 71.4%
- charon/core/ssz.go:337: sszValFromVersion 90.9%
- charon/core/ssz.go:366: marshalSSZVersionedTo 75.0%
- charon/core/ssz.go:389: unmarshalSSZVersioned 71.4%
- charon/core/ssz.go:421: sizeSSZVersioned 100.0%
- charon/core/ssz.go:426: VersionedSSZValueForT 100.0%
- charon/core/ssz.go:437: MarshalSSZ 75.0%
- charon/core/ssz.go:446: MarshalSSZTo 81.8%
- charon/core/ssz.go:471: SizeSSZ 100.0%
- charon/core/ssz.go:475: UnmarshalSSZ 73.3%
- charon/core/ssz.go:510: MarshalSSZTo 100.0%
- charon/core/ssz.go:535: SizeSSZ 100.0%
- charon/core/ssz.go:539: UnmarshalSSZ 94.4%
- charon/core/tracing.go:22: StartDutyTrace 90.9%
- charon/core/tracing.go:48: End 0.0%
- charon/core/tracing.go:54: WithTracing 0.0%
- charon/core/tracker/inclusion.go:80: Submitted 75.0%
- charon/core/tracker/inclusion.go:148: Trim 87.5%
- charon/core/tracker/inclusion.go:167: CheckBlock 79.3%
- charon/core/tracker/inclusion.go:222: checkAggregationInclusion 75.0%
- charon/core/tracker/inclusion.go:241: checkAttestationInclusion 87.5%
- charon/core/tracker/inclusion.go:260: reportMissed 0.0%
- charon/core/tracker/inclusion.go:292: reportAttInclusion 0.0%
- charon/core/tracker/inclusion.go:318: NewInclusion 72.7%
- charon/core/tracker/inclusion.go:360: Submitted 0.0%
- charon/core/tracker/inclusion.go:372: Run 0.0%
- charon/core/tracker/inclusion.go:401: checkBlock 72.7%
- charon/core/tracker/tracker.go:55: String 100.0%
- charon/core/tracker/tracker.go:63: MsgRootsConsistent 100.0%
- charon/core/tracker/tracker.go:110: New 100.0%
- charon/core/tracker/tracker.go:128: Run 90.5%
- charon/core/tracker/tracker.go:175: dutyFailedStep 100.0%
- charon/core/tracker/tracker.go:207: lastStep 100.0%
- charon/core/tracker/tracker.go:223: analyseDutyFailed 79.4%
- charon/core/tracker/tracker.go:293: analyseFetcherFailed 100.0%
- charon/core/tracker/tracker.go:323: analyseFetcherFailedProposer 88.9%
- charon/core/tracker/tracker.go:347: analyseFetcherFailedAggregator 100.0%
- charon/core/tracker/tracker.go:385: analyseFetcherFailedSyncContribution 100.0%
- charon/core/tracker/tracker.go:422: extractParSigs 100.0%
- charon/core/tracker/tracker.go:460: newFailedDutyReporter 66.7%
- charon/core/tracker/tracker.go:494: newUnsupportedIgnorer 100.0%

- charon/core/tracker/tracker.go:538: analyseParticipation 100.0%
- charon/core/tracker/tracker.go:576: isParSigEventExpected 100.0%
- charon/core/tracker/tracker.go:614: newParticipationReporter 29.0%
- charon/core/tracker/tracker.go:668: FetcherFetched 66.7%
- charon/core/tracker/tracker.go:684: ConsensusProposed 66.7%
- charon/core/tracker/tracker.go:700: DutyDBStored 66.7%
- charon/core/tracker/tracker.go:716: ParSigDBStoredInternal 75.0%
- charon/core/tracker/tracker.go:734: ParSigExBroadcasted 0.0%
- charon/core/tracker/tracker.go:752: ParSigDBStoredExternal 75.0%
- charon/core/tracker/tracker.go:770: SigAggAggregated 66.7%
- charon/core/tracker/tracker.go:786: AggSigDBStored 0.0%
- charon/core/tracker/tracker.go:802: BroadcasterBroadcast 66.7%
- charon/core/tracker/tracker.go:817: InclusionChecked 50.0%
- charon/core/tracker/tracker.go:830: reportParSigs 84.2%
- charon/core/tracker/tracker.go:875: expectInconsistentParSigs 100.0%
- charon/core/tracking.go:12: WithTracking 0.0%
- charon/core/types.go:47: Valid 100.0%
- charon/core/types.go:51: String 100.0%
- charon/core/types.go:71: AllDutyTypes 0.0%
- charon/core/types.go:88: String 100.0%
- charon/core/types.go:112: NewAttesterDuty 100.0%
- charon/core/types.go:125: NewRandaoDuty 100.0%
- charon/core/types.go:138: NewProposerDuty 100.0%
- charon/core/types.go:151: NewVoluntaryExit 100.0%
- charon/core/types.go:164: NewBuilderProposerDuty 100.0%
- charon/core/types.go:177: NewBuilderRegistrationDuty 0.0%
- charon/core/types.go:190: NewSignatureDuty 0.0%
- charon/core/types.go:203: NewPrepareAggregatorDuty 0.0%
- charon/core/types.go:216: NewAggregatorDuty 0.0%
- charon/core/types.go:229: NewSyncMessageDuty 0.0%
- charon/core/types.go:242: NewPrepareSyncContributionDuty 0.0%
- charon/core/types.go:255: NewSyncContributionDuty 0.0%
- charon/core/types.go:264: NewInfoSyncDuty 0.0%
- charon/core/types.go:277: PubKeyFrom48Bytes 0.0%
- charon/core/types.go:282: PubKeyFromBytes 75.0%
- charon/core/types.go:296: String 0.0%
- charon/core/types.go:305: Bytes 0.0%
- charon/core/types.go:319: ToETH2 0.0%
- charon/core/types.go:346: Clone 0.0%
- charon/core/types.go:373: Clone 0.0%
- charon/core/types.go:420: Clone 0.0%
- charon/core/types.go:437: Clone 0.0%
- charon/core/types.go:455: Clone 0.0%
- charon/core/types.go:477: Next 0.0%
- charon/core/types.go:487: Epoch 0.0%
- charon/core/types.go:492: LastInEpoch 0.0%
- charon/core/types.go:497: FirstInEpoch 0.0%
- charon/core/unsigneddata.go:52: Clone 80.0%
- charon/core/unsigneddata.go:62: MarshalJSON 75.0%
- charon/core/unsigneddata.go:74: UnmarshalJSON 83.3%
- charon/core/unsigneddata.go:92: NewAggregatedAttestation 100.0%
- charon/core/unsigneddata.go:101: Clone 80.0%
- charon/core/unsigneddata.go:111: MarshalJSON 100.0%
- charon/core/unsigneddata.go:115: UnmarshalJSON 80.0%
- charon/core/unsigneddata.go:126: MarshalSSZ 100.0%
- charon/core/unsigneddata.go:130: MarshalSSZTo 100.0%
- charon/core/unsigneddata.go:134: SizeSSZ 100.0%
- charon/core/unsigneddata.go:138: UnmarshalSSZ 100.0%
- charon/core/unsigneddata.go:143: NewVersionedProposal 0.0%
- charon/core/unsigneddata.go:177: Clone 80.0%
- charon/core/unsigneddata.go:187: MarshalJSON 72.2%
- charon/core/unsigneddata.go:226: UnmarshalJSON 64.3%
- charon/core/unsigneddata.go:274: NewVersionedBlindedProposal 0.0%
- charon/core/unsigneddata.go:300: Clone 80.0%
- charon/core/unsigneddata.go:310: MarshalJSON 75.0%
- charon/core/unsigneddata.go:345: UnmarshalJSON 75.0%
- charon/core/unsigneddata.go:381: NewSyncContribution 100.0%
- charon/core/unsigneddata.go:389: Clone 80.0%
- charon/core/unsigneddata.go:399: MarshalJSON 100.0%
- charon/core/unsigneddata.go:403: UnmarshalJSON 100.0%
- charon/core/unsigneddata.go:407: MarshalSSZ 100.0%
- charon/core/unsigneddata.go:411: MarshalSSZTo 100.0%

- charon/core/unsigneddata.go:415: SizeSSZ 100.0%
- charon/core/unsigneddata.go:419: UnmarshalSSZ 100.0%
- charon/core/unsigneddata.go:424: unmarshalUnsignedData 72.7%
- charon/core/validatorapi/eth2types.go:37: UnmarshalJSON 64.3%
- charon/core/validatorapi/eth2types.go:140: MarshalJSON 100.0%
- charon/core/validatorapi/eth2types.go:147: MarshalJSON 80.0%
- charon/core/validatorapi/metrics.go:30: incAPIErrors 100.0%
- charon/core/validatorapi/metrics.go:34: observeAPILatency 100.0%
- charon/core/validatorapi/router.go:85: NewRouter 100.0%
- charon/core/validatorapi/router.go:281: Error 100.0%
- charon/core/validatorapi/router.go:291: wrap 83.3%
- charon/core/validatorapi/router.go:334: writeResponse 75.0%
- charon/core/validatorapi/router.go:360: wrapTrace 100.0%
- charon/core/validatorapi/router.go:365: getValidators 85.7%
- charon/core/validatorapi/router.go:393: getValidator 81.8%
- charon/core/validatorapi/router.go:415: attestationData 76.9%
- charon/core/validatorapi/router.go:446: submitAttestations 16.7%
- charon/core/validatorapi/router.go:459: proposerDuties 77.8%
- charon/core/validatorapi/router.go:501: attesterDuties 85.7%
- charon/core/validatorapi/router.go:546: syncCommitteeDuties 80.0%
- charon/core/validatorapi/router.go:577: syncCommitteeContribution 76.5%
- charon/core/validatorapi/router.go:611: submitContributionAndProofs 16.7%
- charon/core/validatorapi/router.go:630: proposeBlockV3 81.5%
- charon/core/validatorapi/router.go:692: proposeBlock 100.0%
- charon/core/validatorapi/router.go:721: proposeBlindedBlock 92.3%
- charon/core/validatorapi/router.go:750: getProposeBlockParams 83.3%
- charon/core/validatorapi/router.go:773: createProposeBlockResponse 29.4%
- charon/core/validatorapi/router.go:826: createProposeBlindedBlockResponse 27.3%
- charon/core/validatorapi/router.go:860: submitProposal 96.3%
- charon/core/validatorapi/router.go:921: submitBlindedBlock 82.4%
- charon/core/validatorapi/router.go:962: submitValidatorRegistrations 87.5%
- charon/core/validatorapi/router.go:982: aggregateBeaconCommitteeSelections 75.0%
- charon/core/validatorapi/router.go:999: aggregateSyncCommitteeSelections 75.0%
- charon/core/validatorapi/router.go:1016: submitExit 80.0%
- charon/core/validatorapi/router.go:1027: proposerConfig 20.0%
- charon/core/validatorapi/router.go:1038: aggregateAttestation 7.7%
- charon/core/validatorapi/router.go:1068: submitAggregateAttestations 77.8%
- charon/core/validatorapi/router.go:1085: submitSyncCommitteeMessages 77.8%
- charon/core/validatorapi/router.go:1104: submitProposalPreparations 50.0%
- charon/core/validatorapi/router.go:1111: nodeVersion 83.3%
- charon/core/validatorapi/router.go:1134: proxyHandler 68.4%
- charon/core/validatorapi/router.go:1169: getBeaconNodeAddress 80.0%
- charon/core/validatorapi/router.go:1180: writeError 88.2%
- charon/core/validatorapi/router.go:1238: unmarshal 87.5%
- charon/core/validatorapi/router.go:1284: uintParam 85.7%
- charon/core/validatorapi/router.go:1306: uintQuery 71.4%
- charon/core/validatorapi/router.go:1329: hexQueryFixed 88.9%
- charon/core/validatorapi/router.go:1350: hexQuery 87.5%
- charon/core/validatorapi/router.go:1381: WriteHeader 100.0%
- charon/core/validatorapi/router.go:1392: getValidatorIDs 100.0%
- charon/core/validatorapi/router.go:1397: getQueryArrayParameter 100.0%
- charon/core/validatorapi/router.go:1409: getValidatorIDsFromJSON 75.0%
- charon/core/validatorapi/router.go:1422: getValidatorsByID 88.2%
- charon/core/validatorapi/router.go:1486: withCtxDuration 100.0%
- charon/core/validatorapi/router.go:1492: getCtxDuration 71.4%
- charon/core/validatorapi/router.go:1508: getExecutionOptimisticFromMetadata 85.7%
- charon/core/validatorapi/router.go:1527: getDependentRootFromMetadata 85.7%
- charon/core/validatorapi/validatorapi.go:38: NewComponentInsecure 50.0%
- charon/core/validatorapi/validatorapi.go:48: NewComponent 85.0%
- charon/core/validatorapi/validatorapi.go:168: RegisterAwaitProposal 100.0%
- charon/core/validatorapi/validatorapi.go:174: RegisterAwaitBlindedProposal 100.0%
- charon/core/validatorapi/validatorapi.go:180: RegisterAwaitAttestation 0.0%
- charon/core/validatorapi/validatorapi.go:186: RegisterAwaitSyncContribution 0.0%
- charon/core/validatorapi/validatorapi.go:192: RegisterPubKeyByAttestation 100.0%
- charon/core/validatorapi/validatorapi.go:198: RegisterGetDutyDefinition 100.0%
- charon/core/validatorapi/validatorapi.go:204: RegisterAwaitAggAttestation 0.0%
- charon/core/validatorapi/validatorapi.go:209: RegisterAwaitAggSigDB 100.0%
- charon/core/validatorapi/validatorapi.go:215: Subscribe 80.0%
- charon/core/validatorapi/validatorapi.go:228: AttestationData 0.0%
- charon/core/validatorapi/validatorapi.go:241: SubmitAttestations 90.3%
- charon/core/validatorapi/validatorapi.go:302: Proposal 76.2%
- charon/core/validatorapi/validatorapi.go:360: BlindedProposal 76.2%

- charon/core/validatorapi/validatorapi.go:418: SubmitProposal 85.7%
- charon/core/validatorapi/validatorapi.go:458: SubmitBlindedProposal 85.7%
- charon/core/validatorapi/validatorapi.go:499: submitRegistration 79.3%
- charon/core/validatorapi/validatorapi.go:555: SubmitValidatorRegistrations 75.0%
- charon/core/validatorapi/validatorapi.go:581: SubmitVoluntaryExit 79.2%
- charon/core/validatorapi/validatorapi.go:628: AggregateBeaconCommitteeSelections 73.1%
- charon/core/validatorapi/validatorapi.go:677: AggregateAttestation 0.0%
- charon/core/validatorapi/validatorapi.go:689: SubmitAggregateAttestations 80.6%
- charon/core/validatorapi/validatorapi.go:746: SyncCommitteeContribution 0.0%
- charon/core/validatorapi/validatorapi.go:756: SubmitSyncCommitteeMessages 81.5%
- charon/core/validatorapi/validatorapi.go:805: SubmitSyncCommitteeContributions 81.2%
- charon/core/validatorapi/validatorapi.go:865: AggregateSyncCommitteeSelections 80.8%
- charon/core/validatorapi/validatorapi.go:913: ProposerDuties 75.0%
- charon/core/validatorapi/validatorapi.go:937: AttesterDuties 75.0%
- charon/core/validatorapi/validatorapi.go:961: SyncCommitteeDuties 75.0%
- charon/core/validatorapi/validatorapi.go:984: Validators 50.0%
- charon/core/validatorapi/validatorapi.go:1014: NodeVersion 0.0%
- charon/core/validatorapi/validatorapi.go:1022: convertValidators 90.9%
- charon/core/validatorapi/validatorapi.go:1042: slotFromTimestamp 69.2%
- charon/core/validatorapi/validatorapi.go:1065: getProposerPubkey 77.8%
- charon/core/validatorapi/validatorapi.go:1083: verifyPartialSig 77.8%
- charon/core/validatorapi/validatorapi.go:1101: getAggregateBeaconCommSelection 83.3%
- charon/core/validatorapi/validatorapi.go:1124: getAggregateSyncCommSelection 83.3%
- charon/core/validatorapi/validatorapi.go:1148: ProposerConfig 75.0%
- charon/core/validatorapi/validatorapi.go:1204: wrapResponse 100.0%
- charon/core/validatorapi/validatorapi.go:1209: wrapResponseWithMetadata 100.0%
- charon/dkg/bcast/client.go:21: newClient 100.0%
- charon/dkg/bcast/client.go:47: Broadcast 88.1%
- charon/dkg/bcast/impl.go:34: RegisterMessageIDFuncs 100.0%
- charon/dkg/bcast/impl.go:43: msgIDAllowed 100.0%
- charon/dkg/bcast/impl.go:53: Broadcast 100.0%
- charon/dkg/bcast/impl.go:58: New 100.0%
- charon/dkg/bcast/impl.go:77: hashAny 100.0%
- charon/dkg/bcast/impl.go:86: newK1Signer 100.0%
- charon/dkg/bcast/impl.go:97: newPeerK1Verifier 63.2%
- charon/dkg/bcast/server.go:21: newServer 100.0%
- charon/dkg/bcast/server.go:70: getMessageIDFunc 100.0%
- charon/dkg/bcast/server.go:79: registerMessageIDFuncs 100.0%
- charon/dkg/bcast/server.go:89: dedupHash 100.0%
- charon/dkg/bcast/server.go:105: handleSigRequest 70.6%
- charon/dkg/bcast/server.go:138: handleMessage 64.3%
- charon/dkg/disk.go:29: loadDefinition 70.6%
- charon/dkg/disk.go:97: writeKeysToKeymanager 80.0%
- charon/dkg/disk.go:127: writeKeysToDisk 90.0%
- charon/dkg/disk.go:147: writeLock 71.4%
- charon/dkg/disk.go:162: checkClearDataDir 90.9%
- charon/dkg/disk.go:210: checkWrites 69.2%
- charon/dkg/disk.go:239: randomHex64 80.0%
- charon/dkg/dkg.go:73: HasTestConfig 100.0%
- charon/dkg/dkg.go:80: Run 73.5%
- charon/dkg/dkg.go:380: setupP2P 84.0%
- charon/dkg/dkg.go:429: startSyncProtocol 85.5%
- charon/dkg/dkg.go:546: signAndAggLockHash 76.7%
- charon/dkg/dkg.go:605: signAndAggDepositData 76.9%
- charon/dkg/dkg.go:634: signAndAggValidatorRegistrations 71.4%
- charon/dkg/dkg.go:658: aggLockHashSig 82.6%
- charon/dkg/dkg.go:706: signLockHash 80.0%
- charon/dkg/dkg.go:726: signDepositMsgs 75.0%
- charon/dkg/dkg.go:771: signValidatorRegistrations 76.0%
- charon/dkg/dkg.go:821: aggDepositData 78.6%
- charon/dkg/dkg.go:905: aggValidatorRegistrations 75.6%
- charon/dkg/dkg.go:993: createDistValidators 87.9%
- charon/dkg/dkg.go:1062: writeLockToAPI 71.4%
- charon/dkg/dkg.go:1078: validateKeymanagerFlags 100.0%
- charon/dkg/dkg.go:1099: logPeerSummary 100.0%
- charon/dkg/dkg.go:1112: builderRegistrationFromETH2 69.2%
- charon/dkg/dkg.go:1144: setRegistrationSignature 75.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:33: Reset 100.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:42: String 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:46: ProtoMessage 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:48: ProtoReflect 85.7%
- charon/dkg/dkgpb/v1/bcast.pb.go:61: Descriptor 0.0%

- charon/dkg/dkgpb/v1/bcast.pb.go:65: GetId 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:72: GetMessage 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:88: Reset 100.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:97: String 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:101: ProtoMessage 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:103: ProtoReflect 85.7%
- charon/dkg/dkgpb/v1/bcast.pb.go:116: Descriptor 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:120: GetId 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:127: GetSignature 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:144: Reset 100.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:153: String 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:157: ProtoMessage 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:159: ProtoReflect 85.7%
- charon/dkg/dkgpb/v1/bcast.pb.go:172: Descriptor 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:176: GetId 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:183: GetMessage 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:190: GetSignatures 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:232: file_dkg_dkgpb_v1_bcast_proto_rawDescGZIP 0.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:256: init 100.0%
- charon/dkg/dkgpb/v1/bcast.pb.go:257: file_dkg_dkgpb_v1_bcast_proto_init 29.6%
- charon/dkg/dkgpb/v1/frost.pb.go:33: Reset 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:42: String 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:46: ProtoMessage 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:48: ProtoReflect 100.0%
- charon/dkg/dkgpb/v1/frost.pb.go:61: Descriptor 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:65: GetValIdx 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:72: GetSourceId 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:79: GetTargetId 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:94: Reset 100.0%
- charon/dkg/dkgpb/v1/frost.pb.go:103: String 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:107: ProtoMessage 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:109: ProtoReflect 85.7%
- charon/dkg/dkgpb/v1/frost.pb.go:122: Descriptor 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:126: GetCasts 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:144: Reset 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:153: String 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:157: ProtoMessage 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:159: ProtoReflect 42.9%
- charon/dkg/dkgpb/v1/frost.pb.go:172: Descriptor 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:176: GetKey 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:183: GetWi 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:190: GetCi 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:197: GetCommitments 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:212: Reset 100.0%
- charon/dkg/dkgpb/v1/frost.pb.go:221: String 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:225: ProtoMessage 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:227: ProtoReflect 85.7%
- charon/dkg/dkgpb/v1/frost.pb.go:240: Descriptor 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:244: GetShares 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:261: Reset 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:270: String 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:274: ProtoMessage 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:276: ProtoReflect 100.0%
- charon/dkg/dkgpb/v1/frost.pb.go:289: Descriptor 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:293: GetKey 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:300: GetId 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:307: GetValue 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:322: Reset 100.0%
- charon/dkg/dkgpb/v1/frost.pb.go:331: String 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:335: ProtoMessage 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:337: ProtoReflect 85.7%
- charon/dkg/dkgpb/v1/frost.pb.go:350: Descriptor 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:354: GetCasts 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:371: Reset 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:380: String 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:384: ProtoMessage 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:386: ProtoReflect 42.9%
- charon/dkg/dkgpb/v1/frost.pb.go:399: Descriptor 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:403: GetKey 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:410: GetVerificationKey 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:417: GetVkShare 0.0%
- charon/dkg/dkgpb/v1/frost.pb.go:484: file_dkg_dkgpb_v1_frost_proto_rawDescGZIP 0.0%

- charon/dkg/dkgpb/v1/frost.pb.go:515: init 100.0%
- charon/dkg/dkgpb/v1/frost.pb.go:516: file_dkg_dkgpb_v1_frost_proto_init 15.7%
- charon/dkg/dkgpb/v1/nodesigs.pb.go:32: Reset 100.0%
- charon/dkg/dkgpb/v1/nodesigs.pb.go:41: String 0.0%
- charon/dkg/dkgpb/v1/nodesigs.pb.go:45: ProtoMessage 0.0%
- charon/dkg/dkgpb/v1/nodesigs.pb.go:47: ProtoReflect 85.7%
- charon/dkg/dkgpb/v1/nodesigs.pb.go:60: Descriptor 0.0%
- charon/dkg/dkgpb/v1/nodesigs.pb.go:64: GetSignature 66.7%
- charon/dkg/dkgpb/v1/nodesigs.pb.go:71: GetPeerIndex 66.7%
- charon/dkg/dkgpb/v1/nodesigs.pb.go:99: file_dkg_dkgpb_v1_nodesigs_proto_rawDescGZIP 0.0%
- charon/dkg/dkgpb/v1/nodesigs.pb.go:118: init 100.0%
- charon/dkg/dkgpb/v1/nodesigs.pb.go:119: file_dkg_dkgpb_v1_nodesigs_proto_init 53.3%
- charon/dkg/dkgpb/v1/sync.pb.go:36: Reset 100.0%
- charon/dkg/dkgpb/v1/sync.pb.go:45: String 0.0%
- charon/dkg/dkgpb/v1/sync.pb.go:49: ProtoMessage 0.0%
- charon/dkg/dkgpb/v1/sync.pb.go:51: ProtoReflect 85.7%
- charon/dkg/dkgpb/v1/sync.pb.go:64: Descriptor 0.0%
- charon/dkg/dkgpb/v1/sync.pb.go:68: GetTimestamp 0.0%
- charon/dkg/dkgpb/v1/sync.pb.go:75: GetHashSignature 0.0%
- charon/dkg/dkgpb/v1/sync.pb.go:82: GetShutdown 0.0%
- charon/dkg/dkgpb/v1/sync.pb.go:89: GetVersion 0.0%
- charon/dkg/dkgpb/v1/sync.pb.go:96: GetStep 0.0%
- charon/dkg/dkgpb/v1/sync.pb.go:112: Reset 100.0%
- charon/dkg/dkgpb/v1/sync.pb.go:121: String 0.0%
- charon/dkg/dkgpb/v1/sync.pb.go:125: ProtoMessage 0.0%
- charon/dkg/dkgpb/v1/sync.pb.go:127: ProtoReflect 85.7%
- charon/dkg/dkgpb/v1/sync.pb.go:140: Descriptor 0.0%
- charon/dkg/dkgpb/v1/sync.pb.go:144: GetSyncTimestamp 0.0%
- charon/dkg/dkgpb/v1/sync.pb.go:151: GetError 0.0%
- charon/dkg/dkgpb/v1/sync.pb.go:195: file_dkg_dkgpb_v1_sync_proto_rawDescGZIP 0.0%
- charon/dkg/dkgpb/v1/sync.pb.go:218: init 100.0%
- charon/dkg/dkgpb/v1/sync.pb.go:219: file_dkg_dkgpb_v1_sync_proto_init 38.1%
- charon/dkg/exchanger.go:58: newExchanger 93.8%
- charon/dkg/exchanger.go:106: exchange 70.0%
- charon/dkg/exchanger.go:129: pushPsigs 80.0%
- charon/dkg/exchanger.go:171: Add 100.0%
- charon/dkg/exchanger.go:175: C 0.0%
- charon/dkg/frost.go:50: runFrostParallel 75.0%
- charon/dkg/frost.go:88: newFrostParticipants 91.7%
- charon/dkg/frost.go:117: round1 88.9%
- charon/dkg/frost.go:148: round2 85.7%
- charon/dkg/frost.go:171: getRound2Inputs 100.0%
- charon/dkg/frost.go:198: makeShares 88.0%
- charon/dkg/frost.go:251: pointToPubKey 100.0%
- charon/dkg/frost.go:257: scalarToSecretShare 100.0%
- charon/dkg/frostp2p.go:35: frostMessageIDs 100.0%
- charon/dkg/frostp2p.go:41: newFrostP2P 93.3%
- charon/dkg/frostp2p.go:83: newCheckMsg 85.0%
- charon/dkg/frostp2p.go:122: newBcastCallback 90.2%
- charon/dkg/frostp2p.go:199: newP2PCallback 90.0%
- charon/dkg/frostp2p.go:248: Round1 81.1%
- charon/dkg/frostp2p.go:321: Round2 85.7%
- charon/dkg/frostp2p.go:350: makeRound1Response 85.7%
- charon/dkg/frostp2p.go:381: makeRound2Response 87.5%
- charon/dkg/frostp2p.go:396: shamirShareToProto 100.0%
- charon/dkg/frostp2p.go:404: shamirShareFromProto 66.7%
- charon/dkg/frostp2p.go:420: round1CastToProto 100.0%
- charon/dkg/frostp2p.go:434: round1CastFromProto 72.2%
- charon/dkg/frostp2p.go:470: round2CastToProto 100.0%
- charon/dkg/frostp2p.go:478: round2CastFromProto 66.7%
- charon/dkg/frostp2p.go:503: keyToProto 100.0%
- charon/dkg/frostp2p.go:511: keyFromProto 66.7%
- charon/dkg/frostp2p.go:524: frostProtocol 100.0%
- charon/dkg/nodesigs.go:27: nodeSigMsgIDs 100.0%
- charon/dkg/nodesigs.go:47: newNodeSigBcast 100.0%
- charon/dkg/nodesigs.go:69: lockHash 85.7%
- charon/dkg/nodesigs.go:87: allSigs 87.5%
- charon/dkg/nodesigs.go:106: setSig 100.0%
- charon/dkg/nodesigs.go:114: broadcastCallback 85.0%
- charon/dkg/nodesigs.go:150: checkMessage 80.0%
- charon/dkg/nodesigs.go:161: exchange 83.3%
- charon/dkg/share.go:28: msgFromShare 100.0%

- charon/dkg/sync/client.go:25: WithPeriod 100.0%
- charon/dkg/sync/client.go:32: NewClient 100.0%
- charon/dkg/sync/client.go:73: Run 70.0%
- charon/dkg/sync/client.go:107: SetStep 100.0%
- charon/dkg/sync/client.go:115: getStep 100.0%
- charon/dkg/sync/client.go:123: IsConnected 100.0%
- charon/dkg/sync/client.go:132: Shutdown 75.0%
- charon/dkg/sync/client.go:144: setConnected 100.0%
- charon/dkg/sync/client.go:152: clearConnected 100.0%
- charon/dkg/sync/client.go:160: sendMsgs 85.0%
- charon/dkg/sync/client.go:196: sendMsg 71.4%
- charon/dkg/sync/client.go:218: connect 81.8%
- charon/dkg/sync/client.go:243: isRelayError 100.0%
- charon/dkg/sync/client.go:249: DisableReconnect 0.0%
- charon/dkg/sync/client.go:257: shouldReconnect 100.0%
- charon/dkg/sync/server.go:33: Protocols 0.0%
- charon/dkg/sync/server.go:38: NewServer 100.0%
- charon/dkg/sync/server.go:68: AwaitAllConnected 88.9%
- charon/dkg/sync/server.go:89: setErr 100.0%
- charon/dkg/sync/server.go:97: Err 100.0%
- charon/dkg/sync/server.go:106: AwaitAllShutdown 85.7%
- charon/dkg/sync/server.go:123: AwaitAllAtStep 81.8%
- charon/dkg/sync/server.go:146: isConnected 100.0%
- charon/dkg/sync/server.go:156: setConnected 100.0%
- charon/dkg/sync/server.go:166: setShutdown 100.0%
- charon/dkg/sync/server.go:175: updateStep 100.0%
- charon/dkg/sync/server.go:199: isAllConnected 100.0%
- charon/dkg/sync/server.go:207: isAllShutdown 100.0%
- charon/dkg/sync/server.go:218: isAllAtStep 80.0%
- charon/dkg/sync/server.go:239: clearConnected 100.0%
- charon/dkg/sync/server.go:247: handleStream 80.8%
- charon/dkg/sync/server.go:300: validReq 72.7%
- charon/dkg/sync/server.go:321: Start 71.4%
- charon/dkg/sync/server.go:334: writeSizedProto 69.2%
- charon/dkg/sync/server.go:357: readSizedProto 71.4%
- charon/eth2util/deposit/deposit.go:48: NewMessage 87.5%
- charon/eth2util/deposit/deposit.go:70: MarshalDepositData 77.8%
- charon/eth2util/deposit/deposit.go:133: getDepositDomain 87.5%
- charon/eth2util/deposit/deposit.go:151: GetMessageSigningRoot 73.3%
- charon/eth2util/deposit/deposit.go:179: withdrawalCredsFromAddr 77.8%
- charon/eth2util/deposit/deposit.go:211: VerifyDepositAmounts 100.0%
- charon/eth2util/deposit/deposit.go:235: EthsToGweis 100.0%
- charon/eth2util/deposit/deposit.go:250: DedupAmounts 100.0%
- charon/eth2util/deposit/deposit.go:268: WriteClusterDepositDataFiles 83.3%
- charon/eth2util/deposit/deposit.go:285: WriteDepositDataFile 86.7%
- charon/eth2util/deposit/deposit.go:317: GetDepositFilePath 100.0%
- charon/eth2util/eip712/eip712.go:54: domainToType 100.0%
- charon/eth2util/eip712/eip712.go:66: HashTypedData 75.0%
- charon/eth2util/eip712/eip712.go:81: hashData 87.5%
- charon/eth2util/eip712/eip712.go:96: encodeField 75.0%
- charon/eth2util/eip712/eip712.go:122: hashType 100.0%
- charon/eth2util/eip712/eip712.go:128: encodeType 100.0%
- charon/eth2util/eip712/eip712.go:146: keccakHash 100.0%
- charon/eth2util/enr/enr.go:38: Parse 70.0%
- charon/eth2util/enr/enr.go:106: WithIP 100.0%
- charon/eth2util/enr/enr.go:113: WithTCP 100.0%
- charon/eth2util/enr/enr.go:120: WithUDP 100.0%
- charon/eth2util/enr/enr.go:127: New 85.7%
- charon/eth2util/enr/enr.go:160: IP 100.0%
- charon/eth2util/enr/enr.go:166: TCP 100.0%
- charon/eth2util/enr/enr.go:172: UDP 100.0%
- charon/eth2util/enr/enr.go:178: String 100.0%
- charon/eth2util/enr/enr.go:183: encodeElements 100.0%
- charon/eth2util/enr/enr.go:203: sign 85.7%
- charon/eth2util/enr/enr.go:217: verify 75.0%
- charon/eth2util/enr/enr.go:232: toBigEndian 100.0%
- charon/eth2util/enr/enr.go:243: fromBigEndian 100.0%
- charon/eth2util/eth2exp/attagg.go:44: MarshalJSON 0.0%
- charon/eth2util/eth2exp/attagg.go:58: UnmarshalJSON 0.0%
- charon/eth2util/eth2exp/attagg.go:99: String 0.0%
- charon/eth2util/eth2exp/attagg_old.go:19: IsAttAggregator 81.8%
- charon/eth2util/eth2exp/attagg_old.go:41: IsSyncCommAggregator 70.6%

- charon/eth2util/eth2exp/attagg_old.go:72: hashModulo 87.5%
- charon/eth2util/eth2exp/proposeconf.go:35: MarshalJSON 0.0%
- charon/eth2util/eth2exp/proposeconf.go:52: UnmarshalJSON 0.0%
- charon/eth2util/eth2exp/proposeconf.go:91: TimestampOverride 0.0%
- charon/eth2util/eth2exp/proposeconf.go:106: PublicKeyOverride 0.0%
- charon/eth2util/eth2exp/synccomm_agg.go:47: MarshalJSON 0.0%
- charon/eth2util/eth2exp/synccomm_agg.go:62: UnmarshalJSON 0.0%
- charon/eth2util/eth2exp/synccomm_agg.go:117: String 0.0%
- charon/eth2util/hash.go:13: SlotHashRoot 88.9%
- charon/eth2util/helpers.go:21: EpochFromSlot 0.0%
- charon/eth2util/helpers.go:31: ChecksumAddress 100.0%
- charon/eth2util/helpers.go:44: checksumAddressBytes 100.0%
- charon/eth2util/helpers.go:63: PublicKeyToAddress 100.0%
- charon/eth2util/keymanager/keymanager.go:23: New 100.0%
- charon/eth2util/keymanager/keymanager.go:38: ImportKeystores 90.0%
- charon/eth2util/keymanager/keymanager.go:60: VerifyConnection 100.0%
- charon/eth2util/keymanager/keymanager.go:87: postKeys 80.0%
- charon/eth2util/keymanager/keymanager.go:121: newReq 87.5%
- charon/eth2util/keystore/keystore.go:48: StoreKeysInsecure 100.0%
- charon/eth2util/keystore/keystore.go:57: StoreKeys 100.0%
- charon/eth2util/keystore/keystore.go:61: storeKeysInternal 82.1%
- charon/eth2util/keystore/keystore.go:135: Encrypt 75.0%
- charon/eth2util/keystore/keystore.go:160: decrypt 80.0%
- charon/eth2util/keystore/keystore.go:171: uuid 100.0%
- charon/eth2util/keystore/keystore.go:179: loadPassword 71.4%
- charon/eth2util/keystore/keystore.go:194: storePassword 80.0%
- charon/eth2util/keystore/keystore.go:206: randomHex32 80.0%
- charon/eth2util/keystore/keystore.go:217: checkDir 85.7%
- charon/eth2util/keystore/load.go:24: Keys 0.0%
- charon/eth2util/keystore/load.go:35: SequencedKeys 90.9%
- charon/eth2util/keystore/load.go:67: HasIndex 100.0%
- charon/eth2util/keystore/load.go:74: LoadFilesUnordered 76.0%
- charon/eth2util/keystore/load.go:132: extractFileIndex 77.8%
- charon/eth2util/network.go:31: IsNonZero 0.0%
- charon/eth2util/network.go:78: AddTestNetwork 0.0%
- charon/eth2util/network.go:86: networkFromName 100.0%
- charon/eth2util/network.go💯 networkFromForkVersion 100.0%
- charon/eth2util/network.go:114: ForkVersionToChainID 100.0%
- charon/eth2util/network.go:124: ForkVersionToNetwork 100.0%
- charon/eth2util/network.go:134: NetworkToForkVersion 100.0%
- charon/eth2util/network.go:144: NetworkToForkVersionBytes 85.7%
- charon/eth2util/network.go:159: ValidNetwork 100.0%
- charon/eth2util/network.go:164: NetworkToGenesisTime 0.0%
- charon/eth2util/network.go:173: ForkVersionToGenesisTime 0.0%
- charon/eth2util/registration/registration.go:27: NewMessage 100.0%
- charon/eth2util/registration/registration.go:42: executionAddressFromStr 75.0%
- charon/eth2util/registration/registration.go:65: getRegistrationDomain 87.5%
- charon/eth2util/registration/registration.go:84: GetMessageSigningRoot 70.0%
- charon/eth2util/rlp/rlp.go:13: DecodeBytesList 73.7%
- charon/eth2util/rlp/rlp.go:50: EncodeBytesList 100.0%
- charon/eth2util/rlp/rlp.go:61: DecodeBytes 62.5%
- charon/eth2util/rlp/rlp.go:79: EncodeBytes 100.0%
- charon/eth2util/rlp/rlp.go:88: decodeLength 83.3%
- charon/eth2util/rlp/rlp.go:145: encodeLength 100.0%
- charon/eth2util/rlp/rlp.go:158: toBigEndian 100.0%
- charon/eth2util/rlp/rlp.go:169: fromBigEndian 100.0%
- charon/eth2util/signing/signing.go:38: GetDomain 72.7%
- charon/eth2util/signing/signing.go:60: GetDataRoot 71.4%
- charon/eth2util/signing/signing.go:76: VerifyAggregateAndProofSelection 0.0%
- charon/eth2util/signing/signing.go:91: Verify 80.0%
- charon/eth2util/types.go:42: MarshalJSON 0.0%
- charon/eth2util/types.go:58: UnmarshalJSON 0.0%
- charon/eth2util/types.go:75: ToUint64 0.0%
- charon/eth2util/types.go:80: ToETH2 0.0%
- charon/eth2util/types.go:98: String 0.0%
- charon/eth2util/types.go:108: DataVersionFromUint64 0.0%
- charon/eth2util/types.go:119: DataVersionFromETH2 0.0%
- charon/eth2util/types.go:155: MarshalJSON 0.0%
- charon/eth2util/types.go:171: UnmarshalJSON 0.0%
- charon/eth2util/types.go:188: ToUint64 0.0%
- charon/eth2util/types.go:193: ToETH2 0.0%
- charon/eth2util/types.go:203: String 0.0%

- charon/eth2util/types.go:213: BuilderVersionFromUint64 0.0%
- charon/eth2util/types.go:224: BuilderVersionFromETH2 0.0%
- charon/eth2util/types.go:240: GetTree 0.0%
- charon/eth2util/types.go:245: HashTreeRoot 100.0%
- charon/eth2util/types.go:250: HashTreeRootWith 100.0%
- charon/eth2util/types.go:261: MarshalJSON 75.0%
- charon/eth2util/types.go:271: UnmarshalJSON 83.3%
- charon/main.go:15: main 0.0%
- charon/p2p/bootnode.go:27: NewRelays 0.0%
- charon/p2p/bootnode.go:80: resolveRelay 0.0%
- charon/p2p/bootnode.go:128: queryRelayAddrs 0.0%
- charon/p2p/bootnode.go:201: multiAddrFromENRStr 0.0%
- charon/p2p/config.go:28: ParseTCPAddrs 85.7%
- charon/p2p/config.go:43: Multiaddrs 80.0%
- charon/p2p/config.go:63: resolveListenAddr 83.3%
- charon/p2p/config.go:77: multiAddrFromIPPort 81.8%
- charon/p2p/errors.go:16: hasErrDialBackoff 85.7%
- charon/p2p/errors.go:32: dialErrMsgs 88.9%
- charon/p2p/errors.go:52: NamedAddr 100.0%
- charon/p2p/fuzz.go:23: ReadMsg 0.0%
- charon/p2p/fuzz.go:30: WriteMsg 0.0%
- charon/p2p/gater.go:16: NewConnGater 100.0%
- charon/p2p/gater.go:30: NewOpenGater 100.0%
- charon/p2p/gater.go:44: InterceptPeerDial 100.0%
- charon/p2p/gater.go:48: InterceptAddrDial 100.0%
- charon/p2p/gater.go:52: InterceptAccept 0.0%
- charon/p2p/gater.go:57: InterceptSecured 66.7%
- charon/p2p/gater.go:77: InterceptUpgraded 0.0%
- charon/p2p/k1.go:16: KeyPath 0.0%
- charon/p2p/k1.go:21: LoadPrivKey 0.0%
- charon/p2p/k1.go:31: NewSavedPrivKey 0.0%
- charon/p2p/metrics.go:84: observePing 0.0%
- charon/p2p/metrics.go:89: incPingError 0.0%
- charon/p2p/metrics.go:97: WithBandwidthReporter 0.0%
- charon/p2p/metrics.go:111: LogSentMessage 0.0%
- charon/p2p/metrics.go:113: LogRecvMessage 0.0%
- charon/p2p/metrics.go:115: LogSentMessageStream 0.0%
- charon/p2p/metrics.go:123: LogRecvMessageStream 0.0%
- charon/p2p/name.go:362: PeerName 100.0%
- charon/p2p/p2p.go:35: NewTCPNode 80.0%
- charon/p2p/p2p.go:92: filterAdvertisedAddrs 100.0%
- charon/p2p/p2p.go:119: externalMultiAddrs 38.1%
- charon/p2p/p2p.go:160: multiAddrsViaRelay 0.0%
- charon/p2p/p2p.go:178: NewEventCollector 0.0%
- charon/p2p/p2p.go:209: FindPeer 0.0%
- charon/p2p/p2p.go:215: ForceDirectConnections 0.0%
- charon/p2p/p2p.go:256: isDirectConnAvailable 0.0%
- charon/p2p/p2p.go:271: RegisterConnectionLogger 0.0%
- charon/p2p/p2p.go:391: Listen 0.0%
- charon/p2p/p2p.go:401: ListenClose 0.0%
- charon/p2p/p2p.go:403: Connected 0.0%
- charon/p2p/p2p.go:416: Disconnected 0.0%
- charon/p2p/p2p.go:435: addrType 0.0%
- charon/p2p/p2p.go:445: IsRelayAddr 0.0%
- charon/p2p/peer.go:35: ShareIdx 0.0%
- charon/p2p/peer.go:40: PublicKey 0.0%
- charon/p2p/peer.go:45: AddrInfo 0.0%
- charon/p2p/peer.go:53: NewRelayPeer 0.0%
- charon/p2p/peer.go:62: NewPeerFromENR 75.0%
- charon/p2p/peer.go:76: PeerIDToKey 75.0%
- charon/p2p/peer.go:86: PeerIDFromKey 75.0%
- charon/p2p/peer.go:96: NewMutablePeer 0.0%
- charon/p2p/peer.go:109: Set 0.0%
- charon/p2p/peer.go:121: Peer 0.0%
- charon/p2p/peer.go:133: Subscribe 0.0%
- charon/p2p/peer.go:141: VerifyP2PKey 81.8%
- charon/p2p/ping.go:35: NewPingService 0.0%
- charon/p2p/ping.go:71: pingPeer 0.0%
- charon/p2p/ping.go:83: pingPeerOnce 0.0%
- charon/p2p/ping.go:130: IsRelayError 100.0%
- charon/p2p/ping.go:137: newPingLogger 0.0%
- charon/p2p/ping.go:206: resolveBackoffMsgs 0.0%

- charon/p2p/ping.go:231: newPingDelayCallback 0.0%
- charon/p2p/receive.go:40: RegisterHandler 65.2%
- charon/p2p/relay.go:28: NewRelayReserver 0.0%
- charon/p2p/relay.go:106: NewRelayRouter 0.0%
- charon/p2p/sender.go:56: add 100.0%
- charon/p2p/sender.go:63: get 100.0%
- charon/p2p/sender.go:71: len 100.0%
- charon/p2p/sender.go:79: trim 100.0%
- charon/p2p/sender.go:98: addResult 100.0%
- charon/p2p/sender.go:144: SendAsync 100.0%
- charon/p2p/sender.go:164: SendReceive 100.0%
- charon/p2p/sender.go:176: withRelayRetry 100.0%
- charon/p2p/sender.go:198: WithReceiveTimeout 100.0%
- charon/p2p/sender.go:205: WithSendTimeout 100.0%
- charon/p2p/sender.go:212: WithSendReceiveRTT 0.0%
- charon/p2p/sender.go:219: WithDelimitedProtocol 100.0%
- charon/p2p/sender.go:232: SetFuzzerDefaultsUnsafe 0.0%
- charon/p2p/sender.go:242: defaultSendRecvOpts 100.0%
- charon/p2p/sender.go:261: SendReceive 79.3%
- charon/p2p/sender.go:317: Send 75.0%
- charon/p2p/sender.go:350: protocolPrefix 92.3%
- charon/p2p/sender.go:379: isZeroProto 100.0%
- charon/tbls/herumi.go:26: init 60.0%
- charon/tbls/herumi.go:44: GenerateInsecureKey 0.0%
- charon/tbls/herumi.go:55: GenerateSecretKey 100.0%
- charon/tbls/herumi.go:67: SecretToPublicKey 71.4%
- charon/tbls/herumi.go:84: ThresholdSplitInsecure 0.0%
- charon/tbls/herumi.go:134: ThresholdSplit 85.7%
- charon/tbls/herumi.go:180: RecoverSecret 78.6%
- charon/tbls/herumi.go:220: Aggregate 87.5%
- charon/tbls/herumi.go:244: ThresholdAggregate 80.0%
- charon/tbls/herumi.go:285: Verify 66.7%
- charon/tbls/herumi.go:303: Sign 80.0%
- charon/tbls/herumi.go:315: VerifyAggregate 72.7%
- charon/tbls/herumi.go:343: generateInsecureSecret 0.0%
- charon/tbls/tbls.go:72: SetImplementation 100.0%
- charon/tbls/tbls.go:79: GenerateSecretKey 100.0%
- charon/tbls/tbls.go:85: GenerateInsecureKey 0.0%
- charon/tbls/tbls.go:92: SecretToPublicKey 100.0%
- charon/tbls/tbls.go:98: ThresholdSplit 100.0%
- charon/tbls/tbls.go:104: ThresholdSplitInsecure 0.0%
- charon/tbls/tbls.go:110: RecoverSecret 100.0%
- charon/tbls/tbls.go:115: ThresholdAggregate 100.0%
- charon/tbls/tbls.go:121: Verify 100.0%
- charon/tbls/tbls.go:127: Sign 100.0%
- charon/tbls/tbls.go:133: VerifyAggregate 100.0%
- charon/tbls/tbls.go:139: Aggregate 100.0%
- charon/tbls/tblsconv/tblsconv.go:14: SigFromCore 100.0%
- charon/tbls/tblsconv/tblsconv.go:19: SigToCore 100.0%
- charon/tbls/tblsconv/tblsconv.go:24: SigToETH2 100.0%
- charon/tbls/tblsconv/tblsconv.go:28: PubkeyToETH2 100.0%
- charon/tbls/tblsconv/tblsconv.go:34: PrivkeyFromBytes 100.0%
- charon/tbls/tblsconv/tblsconv.go:44: PubkeyFromBytes 100.0%
- charon/tbls/tblsconv/tblsconv.go:54: PubkeyFromCore 75.0%
- charon/tbls/tblsconv/tblsconv.go:65: SignatureFromBytes 100.0%
- total: (statements) 62.5%

Changelog

- 2023-12-20 - Initial report
- 2024-02-02 - Final report
- 2024-03-21 - Cosmetic updates and tests

About Quantstamp

Quantstamp is a global leader in blockchain security. Founded in 2017, Quantstamp's mission is to securely onboard the next billion users to Web3 through its best-in-class Web3 security products and services.

Quantstamp's team consists of cybersecurity experts hailing from globally recognized organizations including Microsoft, AWS, BMW, Meta, and the Ethereum Foundation. Quantstamp engineers hold PhDs or advanced computer science degrees, with decades of combined experience in formal verification, static analysis, blockchain audits, penetration testing, and original leading-edge research.

To date, Quantstamp has performed more than 500 audits and secured over $200 billion in digital asset risk from hackers. Quantstamp has worked with a diverse range of customers, including startups, category leaders and financial institutions. Brands that Quantstamp has worked with include Ethereum 2.0, Binance, Visa, PayPal, Polygon, Avalanche, Curve, Solana, Compound, Lido, MakerDAO, Arbitrum, OpenSea and the World Economic Forum.

Quantstamp's collaborations and partnerships showcase our commitment to world-class research, development and security. We're honored to work with some of the top names in the industry and proud to secure the future of web3.

Notable Collaborations & Customers:

- Blockchains: Ethereum 2.0, Near, Flow, Avalanche, Solana, Cardano, Binance Smart Chain, Hedera Hashgraph, Tezos
- DeFi: Curve, Compound, Maker, Lido, Polygon, Arbitrum, SushiSwap
- NFT: OpenSea, Parallel, Dapper Labs, Decentraland, Sandbox, Axie Infinity, Illuvium, NBA Top Shot, Zora
- Academic institutions: National University of Singapore, MIT

Timeliness of content

The content contained in the report is current as of the date appearing on the report and is subject to change without notice, unless indicated otherwise by Quantstamp; however, Quantstamp does not guarantee or warrant the accuracy, timeliness, or completeness of any report you access using the internet or other means, and assumes no obligation to update any information following publication or other making available of the report to you by Quantstamp.

Notice of confidentiality

This report, including the content, data, and underlying methodologies, are subject to the confidentiality and feedback provisions in your agreement with Quantstamp. These materials are not to be disclosed, extracted, copied, or distributed except to the extent expressly authorized by Quantstamp.

Links to other websites

You may, through hypertext or other computer links, gain access to web sites operated by persons other than Quantstamp. Such hyperlinks are provided for your reference and convenience only, and are the exclusive responsibility of such web sites&aspo; owners. You agree that Quantstamp are not responsible for the content or operation of such web sites, and that Quantstamp shall have no liability to you or any other person or entity for the use of third-party web sites. Except as described below, a hyperlink from this web site to another web site does not imply or mean that Quantstamp endorses the content on that web site or the operator or operations of that site. You are solely responsible for determining the extent to which you may use any content at any other web sites to which you link from the report. Quantstamp assumes no responsibility for the use of third-party software on any website and shall have no liability whatsoever to any person or entity for the accuracy or completeness of any output generated by such software.

Disclaimer

The review and this report are provided on an as-is, where-is, and as-available basis. To the fullest extent permitted by law, Quantstamp disclaims all warranties, expressed or implied, in connection with this report, its content, and the related services and products and your use thereof, including, without limitation, the implied warranties of merchantability, fitness for a particular purpose, and non-infringement. You agree that your access and/or use of the report and other results of the review, including but not limited to any associated services, products, protocols, platforms, content, and materials, will be at your sole risk. FOR AVOIDANCE OF DOUBT, THE REPORT, ITS CONTENT, ACCESS, AND/OR USAGE THEREOF, INCLUDING ANY ASSOCIATED SERVICES OR MATERIALS, SHALL NOT BE CONSIDERED OR RELIED UPON AS ANY FORM OF FINANCIAL, INVESTMENT, TAX, LEGAL, REGULATORY, OR OTHER ADVICE. This report is based on the scope of materials and documentation provided for a limited review at the time provided. You acknowledge that Blockchain technology remains under development and is subject to unknown risks and flaws and, as such, the report may not be complete or inclusive of all vulnerabilities. The review is limited to the materials identified in the report and does not extend to the compiler layer, or any other areas beyond the programming language, or other programming aspects that could present security risks. The report does not indicate the endorsement by Quantstamp of any particular project or team, nor guarantee its security, and may not be represented as such. No third party is entitled to rely on the report in any way, including for the purpose of making any decisions to buy or sell a product, service or any other asset. Quantstamp does not warrant, endorse, guarantee, or assume responsibility for any product or service advertised or offered by a third party, or any open source or third-party software, code, libraries, materials, or information linked to, called by, referenced by or accessible through the report, its content, or any related services and products, any hyperlinked websites, or any other websites or mobile applications, and we will not be a party to or in any way be responsible for monitoring any transaction between you and any third party. As with the purchase or use of a product or service through any medium or in any environment, you should use your best judgment and exercise caution where appropriate.

© 2024 – Quantstamp, Inc.