Unifying coverage closure when using different verification techniques

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First steps

- Verification uses different approaches and techniques
  - Random
  - Formal
  - Directed testing
  - Fault insertion
  - Other….
- All are aiming to do the same thing:
  - Prove given feature or requirement works
  - Prove over a range of conditions
  - Have a plan where if all the checks were switched off and fully random stimuli were applied, your plan doesn’t pass.

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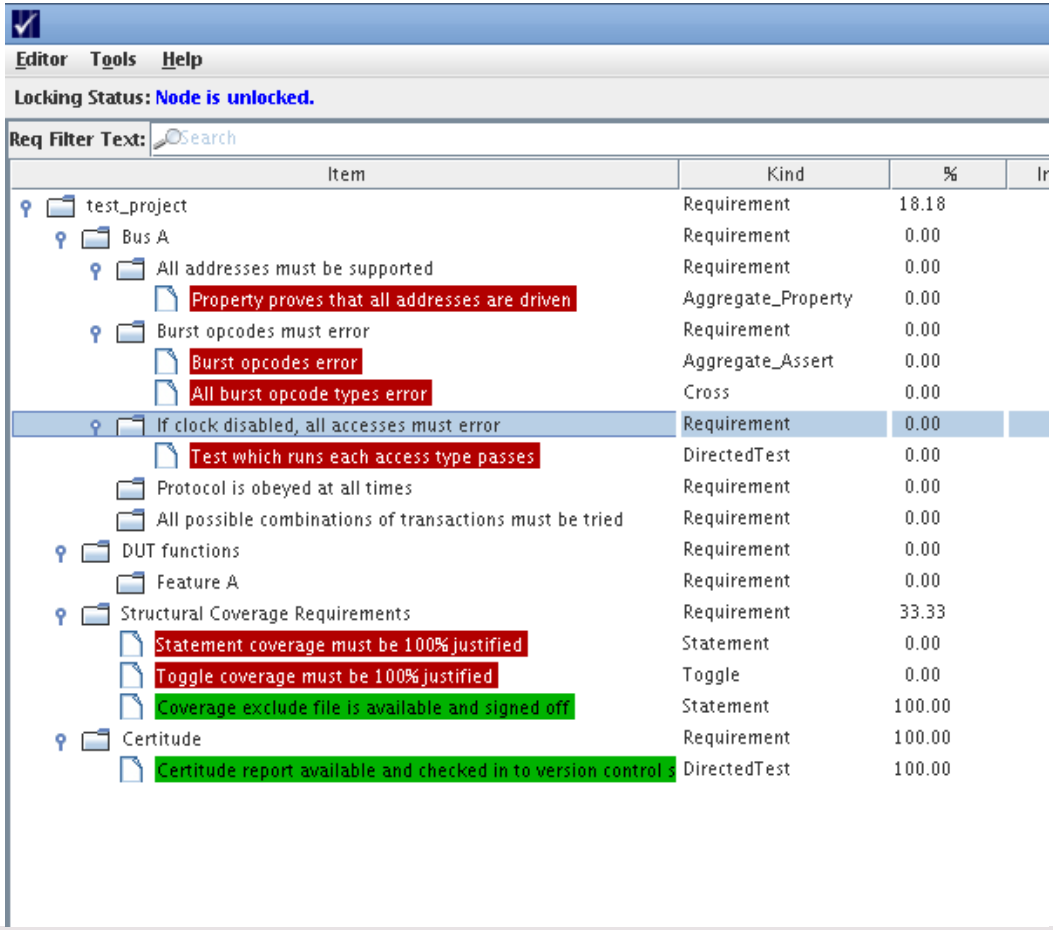
The plan….

- Create a plan which is independent of verification tooling.
  - Example from AsureSign (no backhanders from TVS, honest….)



- Break down design into features and/or requirements.
- All features have at least one check (needed for ISO26262, to prove requirement tested).
- Add goals which then map to coverage.
- Assertions used – these can be SVA/PSL/RTL, or from SV/e checks.
- Properties for more general proofs.
- Use directed tests where they make more sense.
- Use manual sign-off to reference reports/files which do not import via UCIS.
- Will load any UCIS compliant result – structural coverage, functional coverage and formal can be loaded this way.

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Coverage closure

- Now have a combined view of all coverage from all tools in one location.
- A regression is now the combined set of coverage from all tools, and should be tied to a fixed RTL release.
- May be covering the same check in more than one approach – save time/effort by mapping to the most efficient one to achieve.
- If doing full formal proof and can get structural coverage results from the tooling (e.g. OneSpin Quantify), can map to that for the (sub-)blocks proven. Do not then need to do the same in random testbench, for example.
- Can load in pass/fail results from running tests, allowing directed test mapping if that is more efficient.
- Can view results over time to see progress in achieving coverage.

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Summary

- Coverage closure best done in a tool independent way.
  - Avoids vendor lock-in, licence deals change……
  - Allows data from various tools to be brought together for a coherent overview.
- Coverage closure using combined data allows minimisation of overlap. If one technique is fully covering and checking something, do not need to duplicate in another technique to fulfil different sign-off criteria.
- Bringing the data together makes it easier to prove that all requirements have been tested. Can generate one report for proof, which makes ISO26262 sign-off and traceability easier.

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