P4TC Control Plane Performance Testing

TC workshop 0x17

Overview

- Motivation

- Sample test case

- Benchmark numbers

- Regression found

Sample test case

```rust
impl NetlinkTest for OverwhelmEntryAdd {
    /* Creates the test case object */
    fn create() -> Self
    where
        Self: Sized,
    {
        ...
    }

    /* Just returns the test case name */
    fn name(&self) -> &'static str {
        self.name
    }

    /* Runs the test case */
    fn run(&mut self, _args: &Args) -> Result<()> {
        ...
    }

    /* Verify will check whether the test succeeded or not */
    fn verify(&mut self) -> Result<VerificationStatus> {
        ...
    }

    /* Reports the benchmark numbers */
    fn report(&self) {
        ...
    }
}
```

Preliminary Benchmarks Numbers

- AMD Ryzen 4800H in QEMU VM

- exact entry: 641k per thread

- exact with action binding: 463k per thread

- exact batched: 659k per thread (16 per batch)

- exact batched with action binding: 657k per thread (16 per batch)

Performance regression

- Caught when rebasing to net-next

- Numbers went down by half

- Caused by SRSO AMD vulnerability mitigation

- Numbers went "back to normal" after disabling