



Working Draft: Transceiver Management in Swordfish

SNIA Swordfish TWG
Richelle Ahlvers, Chair

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Feedback

- ▀ Suggestions for revisions should be directed to <http://www.snia.org/feedback/>.

TWG Status Disclaimer

- ▮ This proposal is a snapshot of work in progress by the SNIA Swordfish TWG.
- ▮ Contents are subject to change at any time.

Related Materials

- ▮ This overview is released in conjunction with:
 - ▮ Advanced transceiver mockups published on swordfishmockups.com
- ▮ Contents extend the Swordfish v1.2.9 release.

Fundamental Design Assertions

- The model will cover an appropriate level of abstraction for transceiver reporting, configuration and telemetry, based on initial modeling and mockups

Background

- ❖ The optical transceiver industry is transitioning from a world where modules were primarily "connectivity devices" to one where they are becoming actively managed infrastructure components, driven by AI-scale networking, power efficiency as dominant design constraint, and operational reliability.
 - ❖ Optics are becoming the dominant interconnect technology
 - ❖ Power is becoming more important than bandwidth
- ❖ Management complexity is increasing
 - ❖ Older modules were relatively simple: EEPROM access, temperatures, optical power, fault bits
 - ❖ Today's modules expose much richer state.
- ❖ Telemetry is replacing alarms as the primary operational tool

Evolution of Optical Transceiver Management

As transceivers evolve from simple pluggable components into intelligent, telemetry-rich infrastructure elements, management must evolve from module-centric control toward standardized, fleet-scale observability and automation.

▮ Past

- ▮ Configuration-focused
- ▮ Vendor-specific interfaces
- ▮ Reactive fault management

▮ Present

- ▮ CMIS standardization
- ▮ Rich telemetry
- ▮ Multi-vendor interoperability

▮ Future

- ▮ Fleet-scale visibility
- ▮ Predictive analytics
- ▮ Historical telemetry
- ▮ Vendor-neutral APIs
- ▮ Redfish/Swordfish-based management models exposing CMIS-standardized functionality

Enhanced Transceiver Mapping to RF/SF

Physical Components:

- Independent transceiver objects

Logical Components:

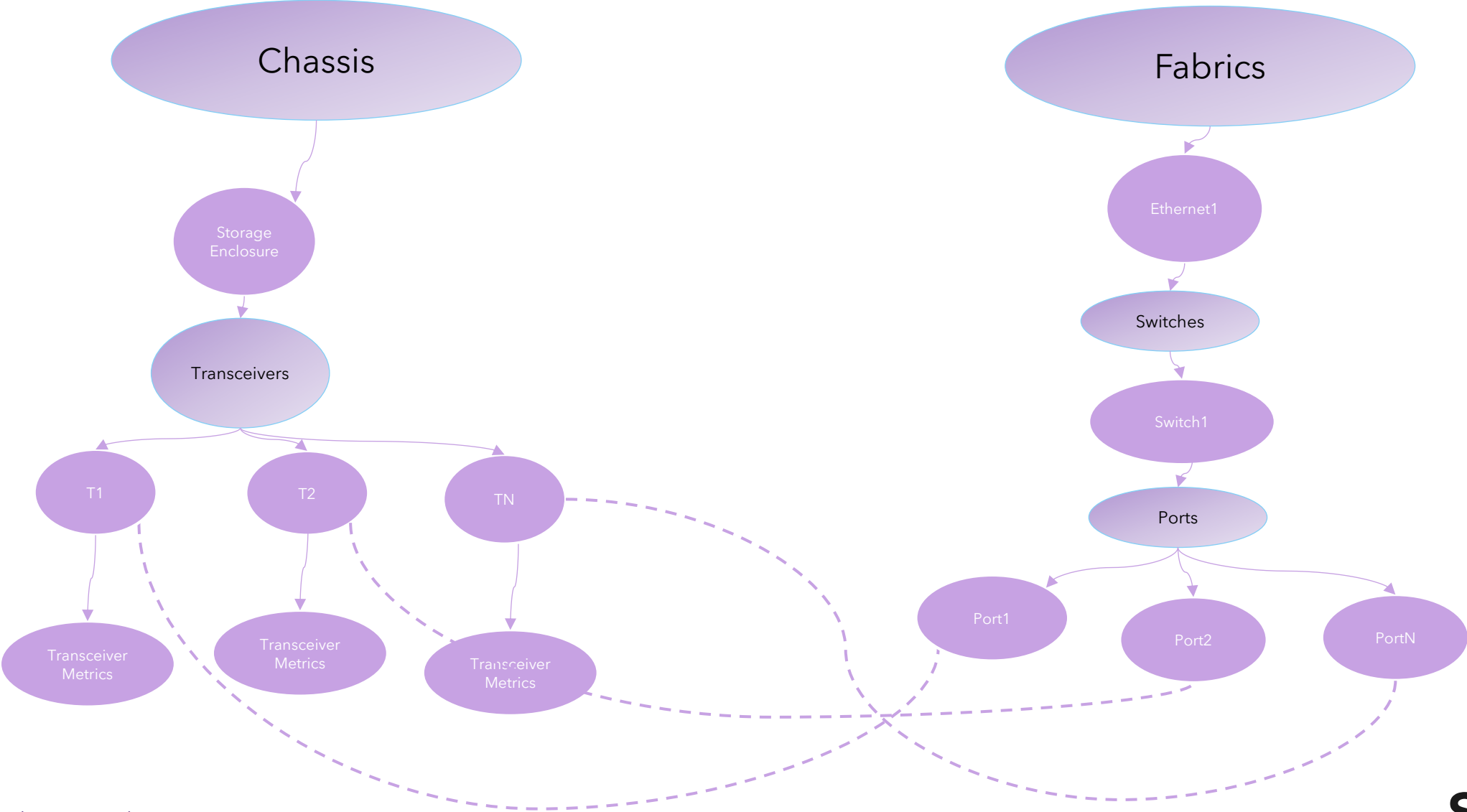
- Transceiver telemetry information

Relationships

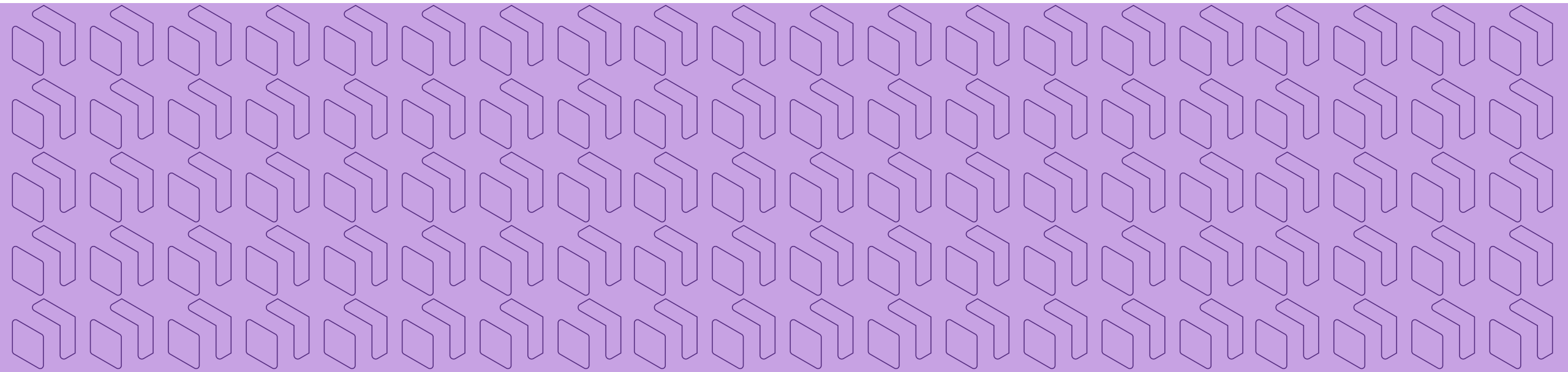
- Bi-directional representation of transceiver to port relationships

Mockup Representation

Contains



Additions to Schema



New Schema Added

- ▣ Transceivers
- ▣ TransceiverMetrics

Transceivers

- ▣ SFPTType
- ▣ CMISVersion
- ▣ ActiveFirmware
- ▣ Connector
- ▣ TxRxStatus (multiple sub-properties)
- ▣ ModuleAndEnvironmentStatus (multiple sub-properties)
- ▣ Metrics (link to separate object)

TransceiverMetrics

- ❏ (Legacy) = RXBytes, TXBytes, RXErrors, TXErrors
- ❏ RXInputPowerMilliWatts
- ❏ TXBiasCurrentMilliAmps
- ❏ TXOutputPowerMilliWatts
- ❏ SupplyVoltage
- ❏ DiagnosticsAndPerformanceMonitoring
 - ❏ Observables (multiple properties): SNR, PAM4LTP, PreFECBER,...
 - ❏ ObservabilityCounters (multiple properties)

For full example, refer to swordfishmockups.com

- Find “Enhanced Transceiver model”