BGP Flow Specification Extension for Feedback Binding

draft-cui-idr-flowspec-feedback-binding-00

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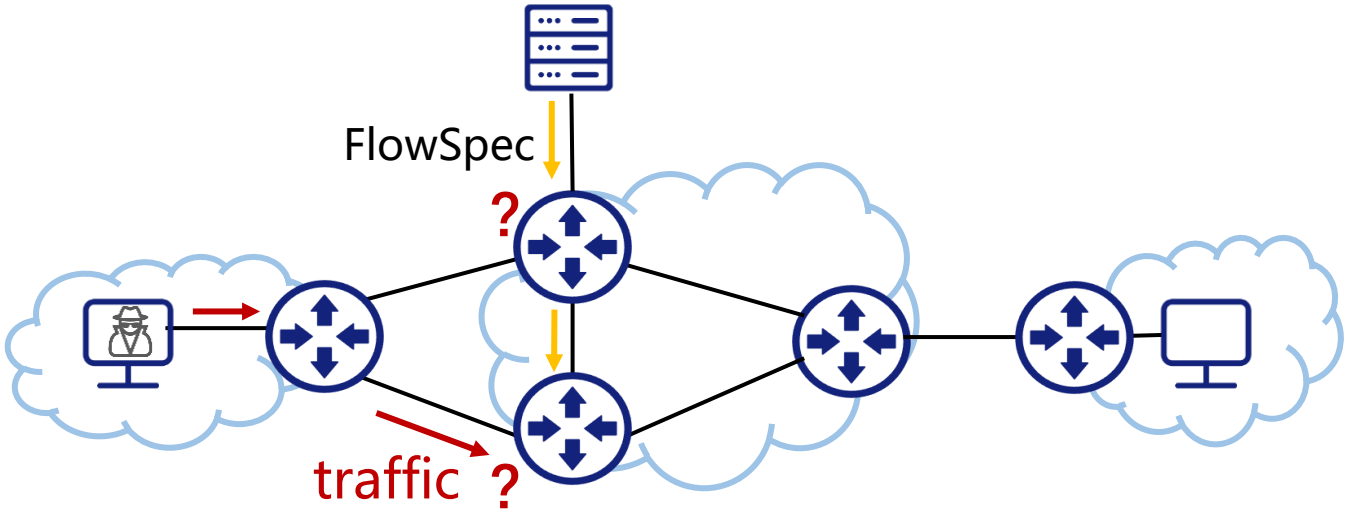
IETF 125

Current Draft Status

- 2025/10 first proposed feedback action @IETF 124
- 2026/2 updated state machine and fields design @Interm meeting
- 2026/3 expanded framework and design discussion @IETF 125

Problem Statement

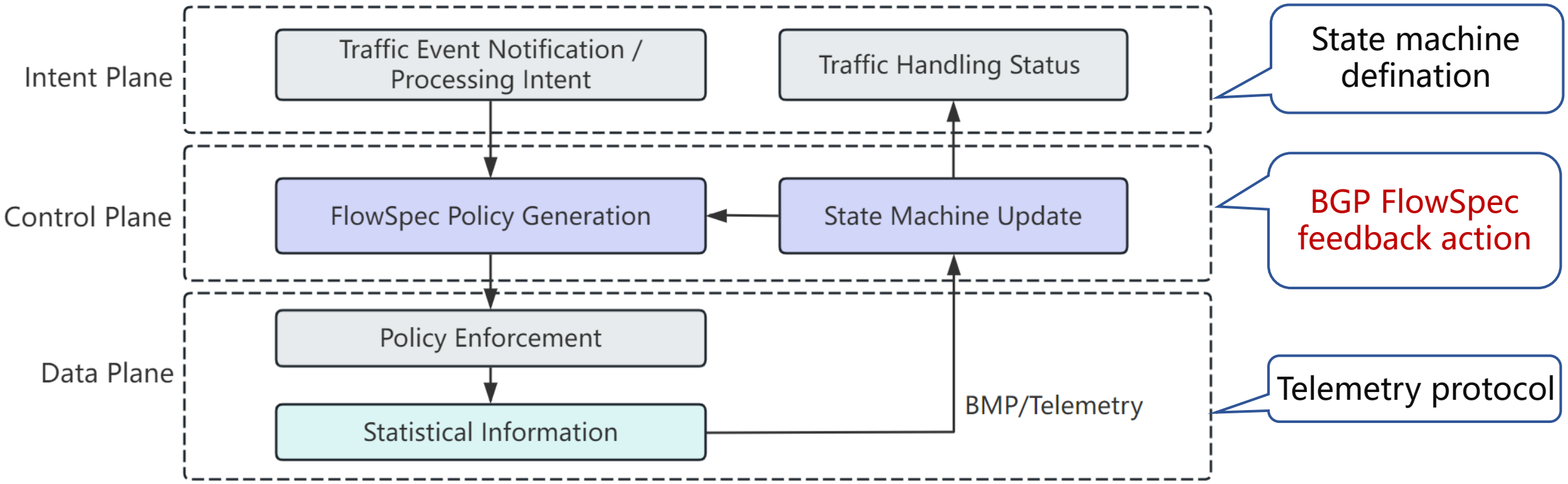
- BGP FlowSpec provides one-way control; successful propagation does not imply effective enforcement
- Rules may become ineffective due to policy conflicts, installation failures, or lack of matching traffic, and may persist without timely resolution
- Especially in the data plane, enforcement results are not visible



Operators need execution feedback to understand real enforcement behavior and continuously optimize traffic handling strategies.

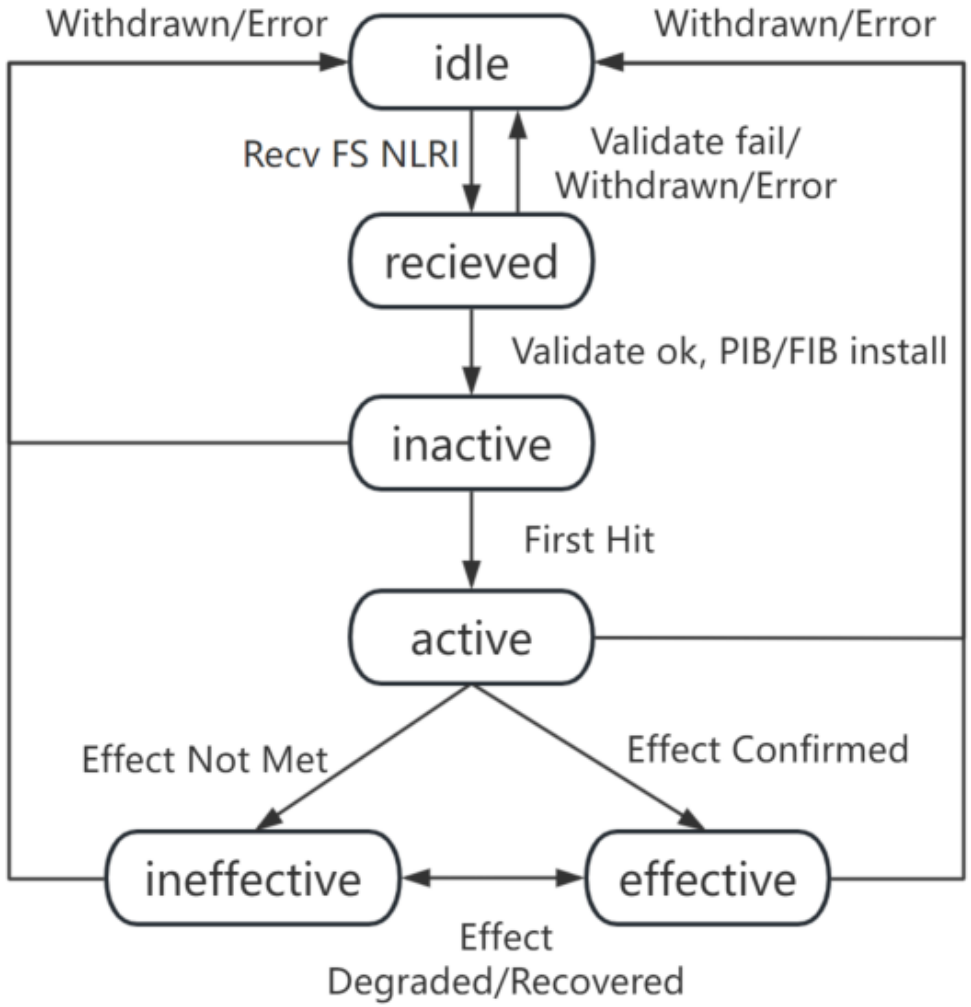
Feedback Optimization Framework for FlowSpec

- FlowSpec routes carry a feedback action. Upon reception, routers validate the request, update the state machine, and configure the selected telemetry mechanism
- Routers then report rule status and periodically export hit statistics or other execution evidence



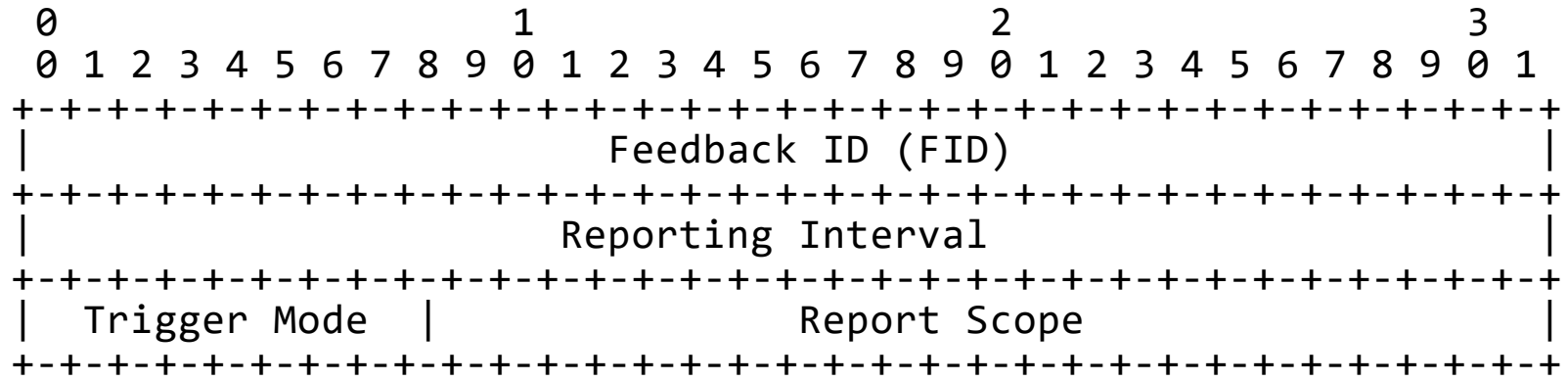
FlowSpec Policy State Machine

- **idle:** no rule object exists
- **received:** FlowSpec NLRI received (visible in RIB)
- **inactive:** rule validated and installed as a policy entry (PIB / FIB entry exists)
- **active:** rule is applied on forwarding path and observed traffic matching
- **effective:** observed enforcement meets expected objectives or thresholds
- **ineffective:** observed enforcement fails to meet expected objectives



FlowSpec Extension of Feedback Action

- Feedback action is carried in the community container
- Encoding



Feedback ID (32 bit): Unique identifier generated by the controller to correlate FlowSpec feedback across rules and devices.

Reporting Interval (32 bit): Periodic feedback reporting interval in seconds; 0 disables periodic reporting.

Trigger Mode (8 bit): Specifies the feedback trigger mode, 00=periodic enabled, 01=event-only, 10/11 = Reserved

Report Scope (8 bits): defines the reporting scope, 00=Global, 01=Inter-AS, 10=Intra-AS, 11=Reserved

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WG Experts Feedback

- ✅ The problem is valid and the direction is useful, but the mechanism needs clearer scoping and encoding.
- ✅ Good idea to have a community container.
- 🆚 **BMP as a feedback channel raised concerns about operational overhead. Telemetry, YANG notifications, and syslog were suggested as alternative or complementary options.**
  - draft-ietf-grow-bmp-rel, draft-geng-grow-bmp-rel-enhancement
- ✅ Cross-AS feedback propagation is sensitive and should likely be restricted by default.
- ✅ Security, congestion, and filtering/subscription need explicit consideration.
  - will be further summarized and evaluated through implementation
- ✅ FSv2 feature interaction and rule precedence must be clarified.
  - Intended as an FSv2 action, aligned with FSv2 design principles.

Discussion Points

- **Can multiple telemetry mechanisms be used together, with clear separation by plane?**
  - Intent plane: YANG notifications, YANG-Push, or gNMI for structured rule status and state changes
  - Control plane: BMP / BMP REL for BGP route events and policy-related feedback
  - Data plane: IPFIX or telemetry for hit statistics and traffic evidence
  - Other options: syslog for alarms and programming failures
  - …

- **How should filtering/subscription be supported to avoid excessive reporting overhead?**

- **Should the draft also provide guidance on the state machine and suitable telemetry protocols?**

Next Steps

- Refine action encoding and align with FSv2
- Looking for collaborators and suitable deployment scenarios

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