Intra-domain SAVNET OAM

draft-cheng-savnet-intra-domain-oam-00

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Introduction

This draft focuses on the charter for SAVNET WG “(3) Definition of routing protocol-independent operation and management mechanisms to operate and manage SAV-related configurations.”

The implementation of OAM (Operations, Administration, and Maintenance) for intra-domain SAVNET.

- Fault detection
- Falut isolation
- Configuration
- Notification
- Accounting
- Performance

Fault Detection

Real-time Monitoring

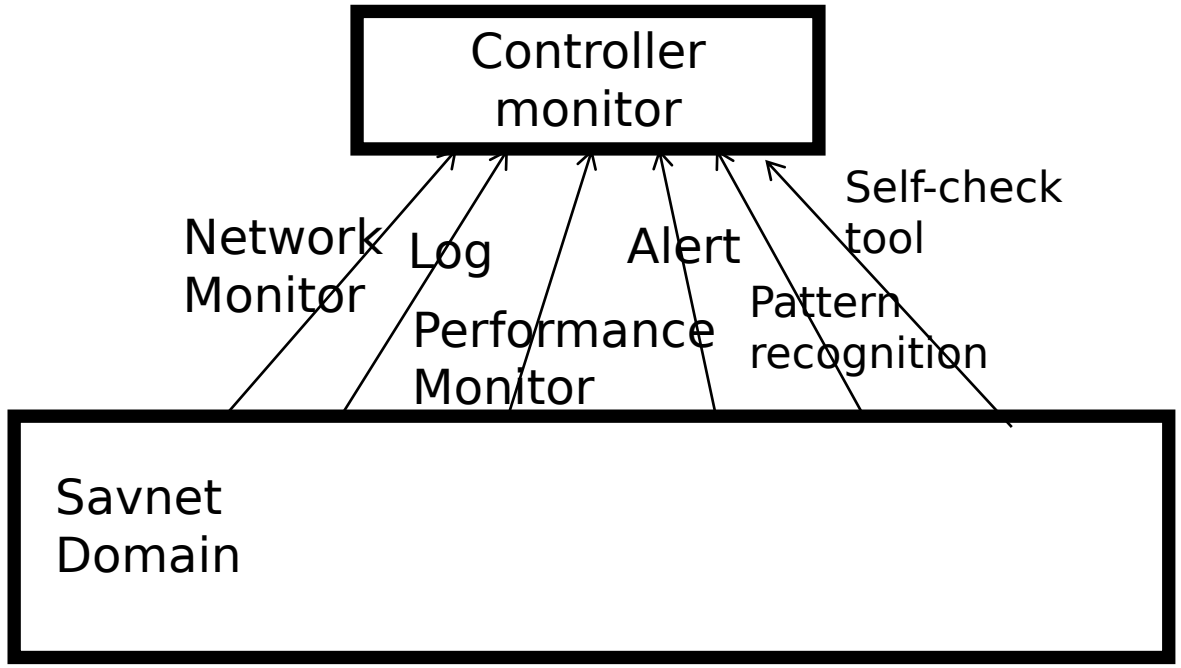
- Network Monitoring: use protocols like SNMP, NetFlow, sFlow, etc.
- Log Analysis
- Performance Monitoring

Fault Detection by Alert System

- Threshold Alerts
- Pattern Recognition

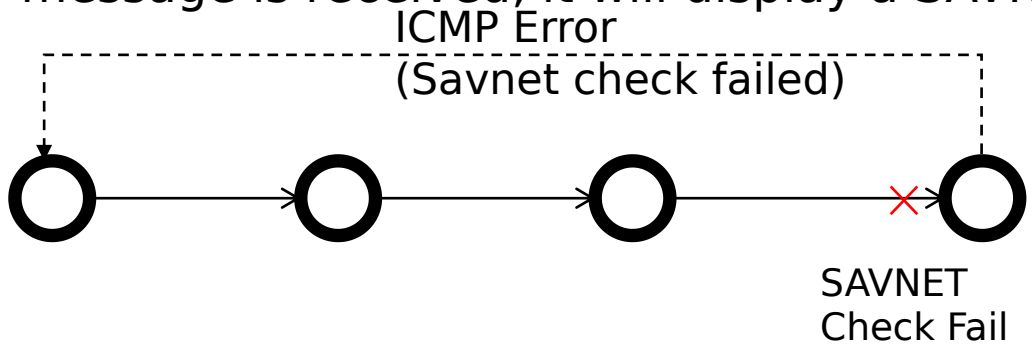
Fault Detection by Automated Diagnostic Tool

- Self-check Tools



Usecase: Fault Detection by PING tool

- Using the Ping tool to test the correctness of SAVNET functionality involves the following steps for sending and receiving packets:
- The source host generates a standard ICMP Echo Request packet and receives an ICMP Echo Reply packet.
- If the local SAVNET check fails, an **ICMP error message** should be sent to the source host, indicating the reason for the failure is the SAVNET check. ICMPv6 "Code" Fields: **SAVNET check failed**
- After receiving the Echo Reply packet, the source host displays a successful detection result. If an ICMP error message is received, it will display a SAVNET filtering failure result.



Fault Isolation

Interface Level:

- **Disable Interface:** If the fault comes from a specific network interface, you can temporarily disable that interface to prevent the spread of abnormal traffic.
- **Adjust Traffic Path:** Modify the routing policy to reroute traffic around the faulty interface.

Routing Level

- **Adjust Routing Table:** Modify the IGP/BGP routing table to avoid routing traffic through the faulty node or path.
- **Withdraw Route Advertisements**: Withdraw route advertisements for the faulty path in BGP, preventing other routers from forwarding traffic to the fault path.

Device Level

- **Isolate Faulty Device**: Temporarily isolate the faulty device from the network and activate backup devices.
- **Device Restart:** If the fault is due to a temporary issue with the device, try restarting the device to restore it to normal operation.

Configuration

- Base Configuration
- Static Configuration
- Interface Configuration
- Protocol Configuration

Base Configuration	
GlobalEnable	Enable/Disable
Capacity	Max SAV Entry Number
Mode	Interface-based prefix allowlist Interface-based prefix blocklist Prefix-based interface allowlist
Unknown Source Action	Allow/Block

Interface Configuration	
Interface Configuration	Enable: Enable/Disable Mode: allowlist/blocklist

Static Configuration	
SAV Static Entry	Source prefix + Interfaces: Action: Allow/Block

IGP Configuration	
IGP SAV Enable	Family: IPv4/IPv6 Enable/Disable
IGP SAV Interface Enable	Interface: IfName Enable/Disable

BGP Configuration	
BGP SAV Enable	Family: IPv4/IPv6 Enable/Disable

Notification

- **Fault Notification**:Faults detected by proactive mechanisms
- **Event**:Reception of event-driven defect indications
- **Security incidents**:Logged security incidents pertaining to the OAM Message Channel
- **Protocol error**:Protocol errors (for example, as caused by misconfiguration)

Accounting

- Global Statistics
- Interface-based Statistics
- Per SAVNET Table Entry Statistics

Accounting	
Global Statistics	the number of passes, drops, lookups not found, and blacklist hits
Interface-based Statistics	Statistics permit-list hits, block-list hits, and lookups not found; Statistics for discarded traffic sent from internal to external and traffic sent from external to internal.
Per SAVNET Table Entry Statistics	Number of passed and dropped packets • For user-side devices, check the allow-list hits count on user-side interfaces • For network-side devices, check the allow-list hits count on the downstream ports • For boundary devices, check the block-list hits count on the upstream ports • For any device, if there is a continuous increase in no-entry hits counts, it should be verified whether any attack traffic is present.

Performance

- The goal is to monitor performance characteristics when the intra-domain SAVNET function is enabled.
- Performance management allows for the measurement of packet forwarding transmission performance within a domain, including **latency** and **packet loss**, which can be used for network fault analysis.
- A tool like savnet-ping can be used for simple performance testing to initially locate network faults.

Next Steps

- Any questions or comments are Welcomed
- Seeking for feedback

THANKS