

Protocol Assisted Protocol (PAP)

[draft-li-rtgwg-protocol-assisted-protocol-03](#)

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Why require east-west assisted protocol function?

➤ Challenges of North-South methods

- Large amount of data to be exported: There may be too many devices, protocols and data.
- High performance requirements on the Controller or NMS to complete all these tasks

➤ User habits

- Local configuration and maintenance, more convenient
- Take time to be adapted to NMS/Controller

➤ Existing methods is in use.

- RSVP-TE PathErr/ResvErr, BGP Notification...

Why a common assisted protocol is needed?

- If the protocol is failed by itself, it cannot advertise the possible protocol maintenance information.
- Restricted fault query/notification mechanisms of the existing control protocols. If more protocol maintenance information is introduced, it may have much effect on the existing operations of the control protocols, e.g.
 - BGP extends the Path attribute in Update packets which will have effect on the normal routing options.
 - RSVP extends the cause code for path setup failures. Only two ULONGs are available.
- Protocol extensibility:
 - If a common protocol is used, it is more extensible and convenient to define and advertise related information.

Use Cases

➤ Troubleshooting Use Cases - BGP route oscillation

- A Request Message sent: “Are you the oscillation source?”
- A Reply Message sent: “I’m the oscillation source!”
- or A Reply Message sent: “I’m not the oscillation source!”, with a further Request Message sent: “Are you the oscillation source?”
- ...
- Until someone replies with “I’m the oscillation source!”

➤ Troubleshooting Use Cases - RSVP-TE set up failure

- A Notification Message “A link failure happens here!” sent from the failure device to the Ingress device.

PAP (Protocol assisted Protocol)

- A new semi-distributive semi-centralized approach
 - A generic “tunnel” for exchanging troubleshooting data of various protocols
- PAP (Protocol assisted Protocol)
 - designed for devices to exchange protocol related information between each other
 - Separates routing and non-routing data
- Merits
 - Facilitates automatic troubleshooting
 - No impact on existing routing system
 - Adds more network-wide data for individual device
 - Not relying on a centralized server
 - Relieves bandwidth/CPU pressure of centralized data collection/analysis

Discussion

- **Discussion 1** : UDP or TCP ?
 - Event Driven(On demand)
 - Low resource consumption
 - Low reliability requirements
- **Discussion 2** : There are two possible options to implement PAP
 - Option 1. PAP is developed independently as a protocol
 - Option 2. PAP reuses the existing protocol (GRASP)

	Grasp	PAP
Vision	The vision is a network that configures, heals, optimizes and protects itself.	Focuses on the exchange of east-west fault information about control-plane protocols. Assists fault locating and self-healing on the control plane.
Message Definition, Interaction Process	Try to reuse the defined messages and procedures of the GRASP protocol.	Defined in the new PAP protocol
Scalability	High resource consumption persistent Connection	Flexible connection, Low resource consumption
Reliability	TCP / UDP(Need extension)	UDP (The application layer need supports)
Security	ACP	MD5

Next Steps

- Comments are welcome
- To discuss with ANIMA

Thank You