

BGP SR Policy Extensions for Template

<https://datatracker.ietf.org/doc/html/draft-zhang-idr-sr-policy-template>

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Backgrounds

- BGP can be used to propagate the SR Policy candidate paths to the headend nodes in the network.

The SR Policy Encoding structure is as follows:

SR Policy SAFI NLRI: <Distinguisher, Policy-Color, Endpoint>

Attributes:

Tunnel Encaps Attribute (23)

Tunnel Type: SR Policy

Binding SID

SRv6 Binding SID

Preference

Priority

Policy Name

Policy Candidate Path Name

Segment List

Weight

Segment

...

...

- Basic attributes of the candidate path are defined in this protocol.

Motivation & Problem Statement

Reasons to use template:

- In application, the head-end routers may need to define many features of the candidate path. Some features are only meaningful to controller and head-end nodes, BGP protocol no need to know them, use template can shield information that BGP no need to know
- Features may change frequently, template can be used to avoid BGP protocol changes too frequently
- Different sr policies with the same feature can use the same template, thus can simplify configuration and improve maintainability

SR Policy

Endpoint 1.1.1.1 color 100(green)

Candidate Path

Preference 100

Backup Path enable

Seamless BFD enable

BFD minimum tx interval 10ms

Traffic statistics enable

Segment List1

SR Policy

Endpoint 1.1.1.1 color 100(green)

Candidate Path

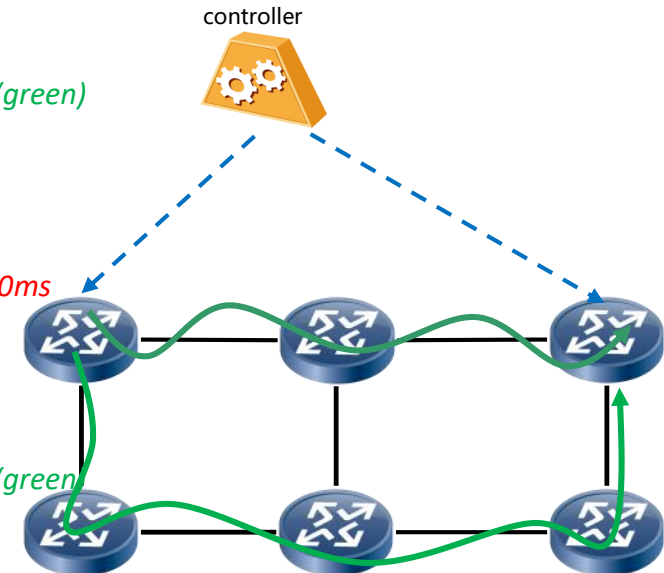
Preference 200

Seamless BFD enable

BFD minimum tx interval 20ms

Traffic statistics enable

Segment List2



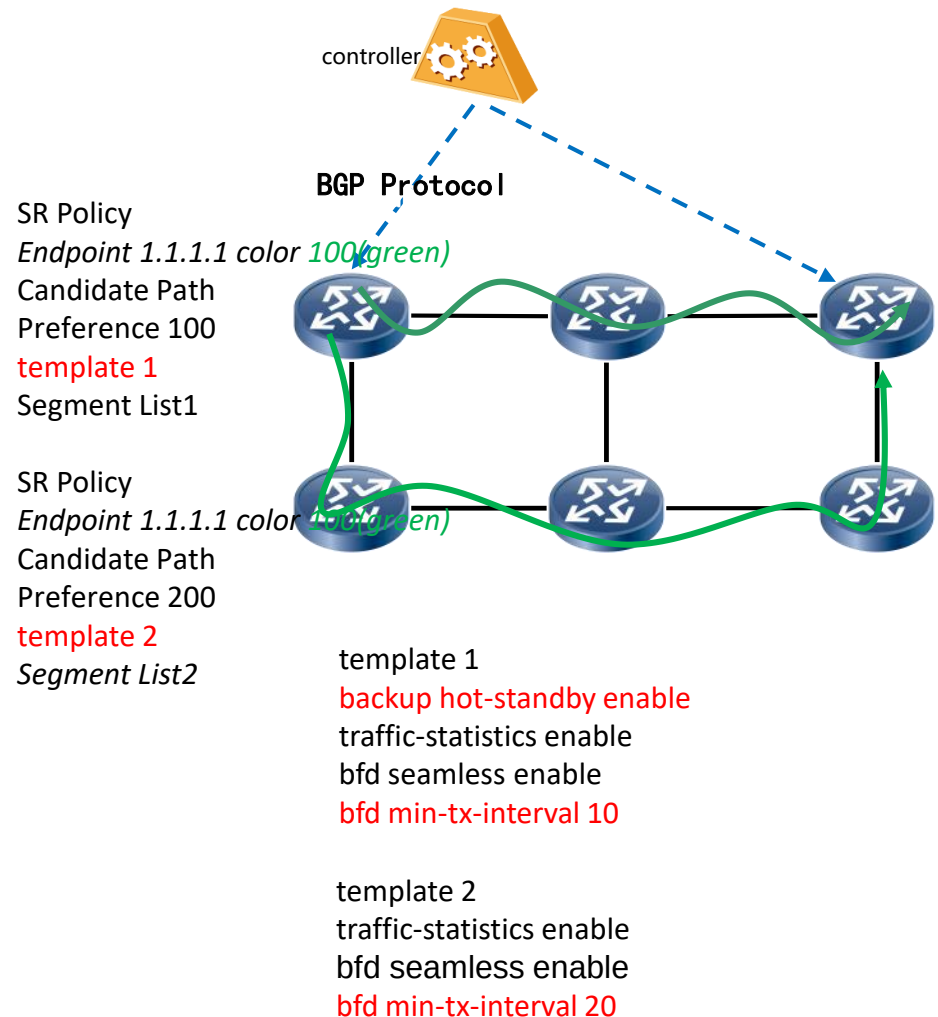
Template process

Template define:

- A group of features for sr policy candidate path
- Use an identifier which is meaningful to the head-end node of SR Policy, the identifier is configured by user or controller and is only valid on the head-end locally.

Template process:

1. Configure template with template ID and template contents on the headend of SR Policy
2. PCE calculate path of SR Policy, and update the path information using BGP update message which carries the template ID in SR Policy candidate path attributes
3. SR Policy head-end nodes find the contents of template using template ID and setup path with the features defined in the template.



BGP SR Policy Extension

SR Policy SAFI NLRI: <Distinguisher, Policy-Color, Endpoint>

Attributes:

Tunnel Encaps Attribute (23)

Tunnel Type: SR Policy

Binding SID

SRv6 Binding SID

Preference

Priority

Policy Name

Policy Candidate Path Name

Explicit NULL Label Policy (ENLP)

Template ID

Segment List

Weight

Segment

Segment

...

...

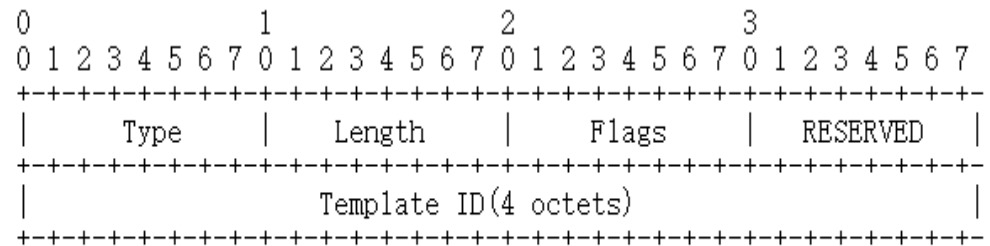


Figure 1: Template ID Sub-TLV

Where:

Type: Template ID, 1 octet, TBD.

Length: 6.

Flags: 1 octet of flags. None are defined at this stage.

Template ID: a 4-octet value.

Operational Considerations

Advertisement of SR Policies

When BGP advertises an SR Policy, different candidate paths of the same SR Policy may have different template IDs or the same template ID, depending on the attributes required by the candidate paths of the SR Policy.

Reception of an SR Policy

SR Policy is only to be processed on the SR Policy headend. and is being incorporated in an SR Policy Module(SRPM).

The SRPM find the local configured template by template ID, and get all the attributes that is configured in the template, and then process the candidate path with these attributes. For example, if the template configure seamless bfd, then the SRPM can create sbfd sessions for each Segment List in the candidate path.

If there is no template find, the SRPM should ignore the template ID and use the candidate path as there is no template ID.

Latest Changes

- Add template name as an optional parameter to add description of the template.

4.1. Template ID sub-TLV

A new sub-TLV called Template ID sub-TLV is defined. Template ID sub-TLV specifies the template ID of an SR policy candidate path. Each sub-TLV is encoded as shown in Figure 1.

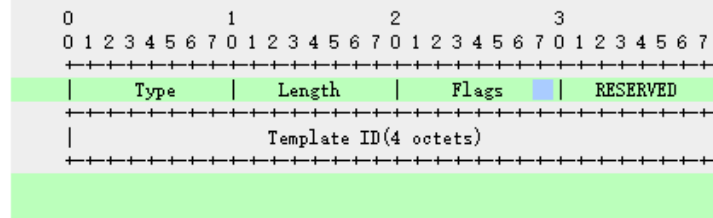


Figure 1: Figure 1: Template ID Sub-TLV

Type: Template ID, 1 octet, TBD.

Length: 6.

Flags: 1 octet of flags. None are defined at this stage. Flags SHOULD be set to zero on transmission and MUST be ignored on receipt.

RESERVED: 1 octet of reserved bits. SHOULD be set to zero on transmission and MUST be ignored on receipt.

Template ID: a 4-octet value.

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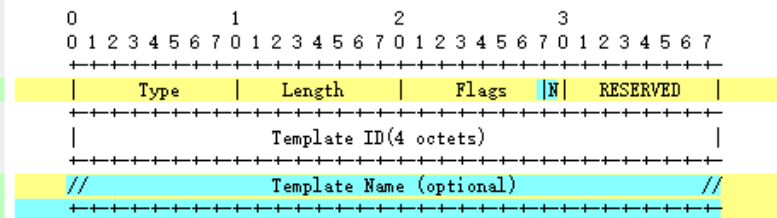


Figure 1: Figure 1: Template ID Sub-TLV

Type: Template ID, 1 octet, TBD.

Length: 6.

Flags: 1 octet of flags.

Where:

N-Flag: This flag, when set, indicates the presence of the Template Name encoding.

RESERVED: 1 octet of reserved bits. SHOULD be set to zero on transmission and MUST be ignored on receipt.

Template ID: a 4-octet value.

Template Name: Template MAY also be assigned with a template name, such template name MUST NOT be considered as identifiers for a template. The size of the template name for the template is limited to 255 bytes.

Next Steps

- Welcome questions and comments
- WG adoption?

Thank you!