BGP Diagnostic Message

draft-raszuk-bgp-diagnostic-message-00

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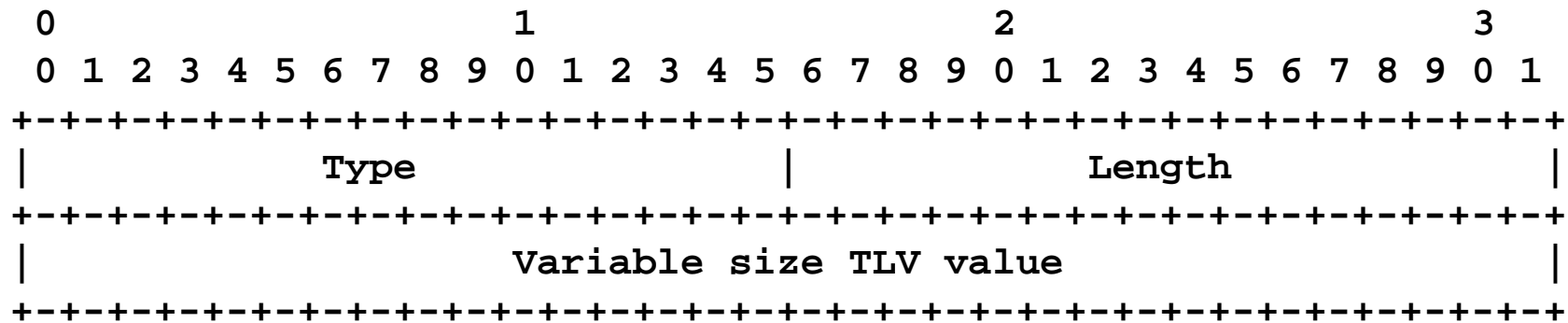*IETF 79, November 2010, Beijing, China*

Agenda

- **Goals**

- **Encoding**

- **Diagnostic message TLVs**

Goals

- To enhance current practices for troubleshooting network connectivity problems .. especially on eBGP boundaries

- To detect routing inconsistencies before they are noticed by customers and result in escalation

- To enable new way of error signaling for the proposal of more granular BGP error handling. (Dropped malformed attributes/updates rather than close the session).

- To enable visibility into installed filters by IBGP peers (RT constrain SAFI)

- To enable push model for routing changes monitoring (example: effectivness of hot potato routing)

Encoding

- New BGP Message type: <u>BGP Diagnostic Message</u>

- Size 128 octets more then any other BGP Messages as defined in RFC 4271 (to enable encoding entire update)

- New BGP capability

- Format of TLV type:

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|             Type              |             Length            |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                     Variable size TLV value                   |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+


Type    - 2 octet value indicating the TLV type
Length  - 2 octet value indicating the TLV length in octets
Value   - Variable length value field
```
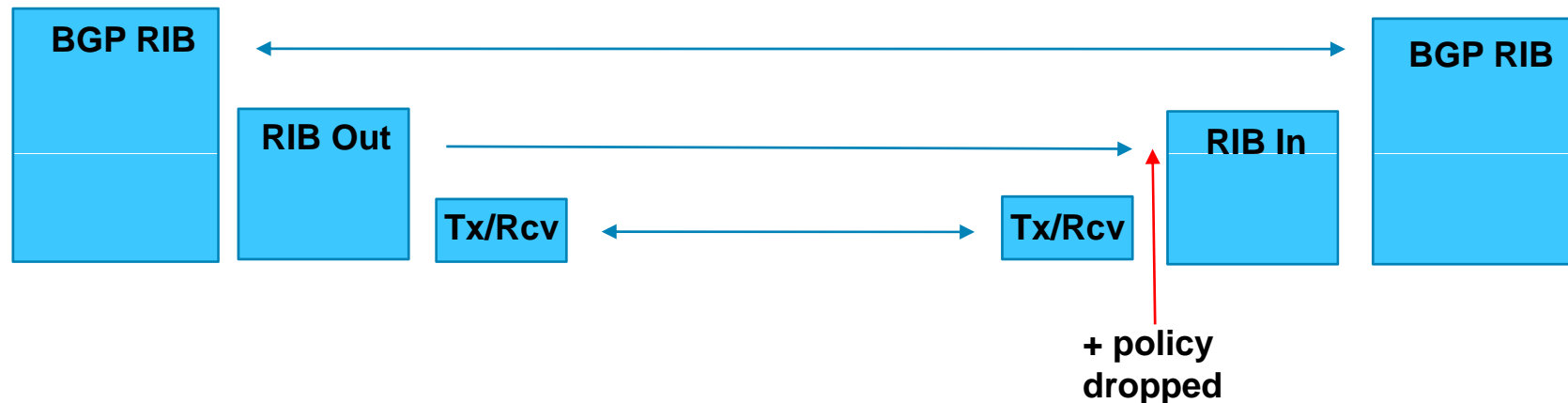
Diagnostic message TLVs

- Operational TLVs

- BGP database counters exchange

- Diagnostics for encoding errors in BGP messages

- AFI/SAFI signaling when malformed update

- Prefix specific BGP debugging

- Intra-domain BGP decision monitoring

- Monitoring of installed Route Target filters

Operational TLVs

- Diagnostic Message Periodic Request

- Max frequency permitted

- Diagnostic Message Query

- Counter's reset request

- Not supported TLV reply

- Enabled and supported TLV types

BGP database counters exchange

- Number of reachable prefixes transmitted/received

- Number of prefixes in BGP_RIB_Out

- Number of paths in BGP_RIB_Out

- Number of prefixes present in BGP_RIB

- Number of paths present in BGP_RIB

BGP RIB					BGP RIB
RIB Out			RIB In	
Tx/Rcv		Tx/Rcv	

+ policy dropped

Diagnostics for encoding errors in BGP messages

- Reachable prefixes present in dropped attribute case

- Un-reachable prefixes present in dropped attribute case

- Reachable prefixes present in malformed update message

- Entire malformed update message enclosure

AFI/SAFI signaling when malformed update

- List of ignored AFI/SAFIs over MP-BGP session due to errors encountered

Prefix specific BGP debugging

- Prefix specific BGP query

- Prefix specific BGP response

Intra-domain BGP decision monitoring

- Number of IGP metric best path tie breaks executed

- Number of BGP best path tie breaks in each selection step

Monitoring of installed Route Target filters

- Request for a list of RTs installed towards given peer by RFC4684

- Reply containing all installed RTs towards given peer

Conclusions

- Tool to simplify troubleshooting of BGP based networks

- Allows for proactive and automated detection of possible protocol or implementation issues

- Very lightweight (most is based only on counters exchange)

- Indicates to peers where malformed attribute or update message is detected and when it does not result in session reset

- Easily extensible to allow for any new type of diagnostic message to be incorporated.