SCTP TML Implementation

Forwarding and Control Element Separation WG

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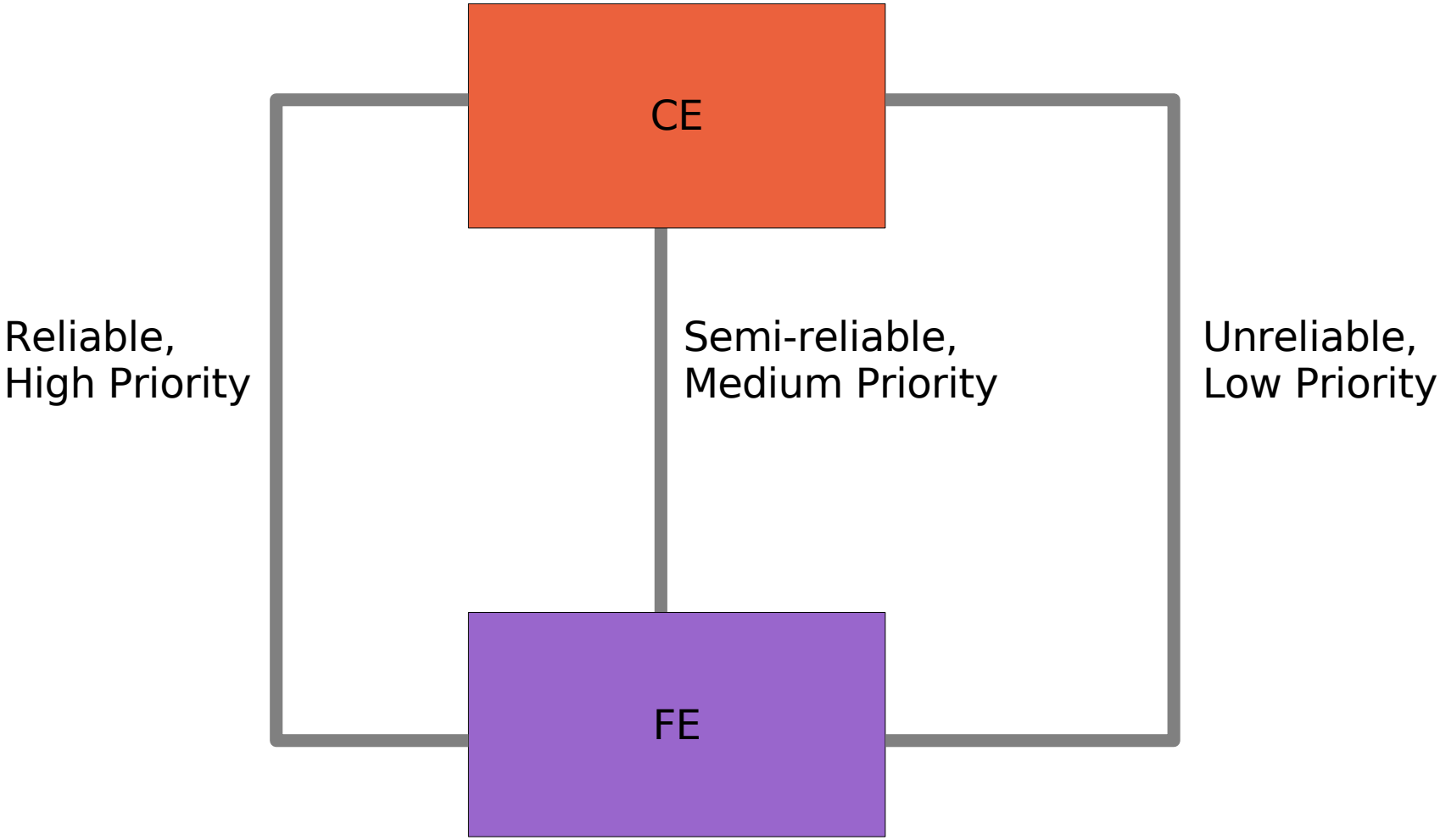
SCTP TML Channels



Why Multiple SCTP sockets

- Alternative is multiple SCTP Streams
  - Essentially we could have a single socket with reliable, semi and unreliable packets
  - Problem is HOL in case a reliable packet sits infront of unreliable packet
    - Done in SCTP to avoid reordering ...
- There is some ongoing work from Michael Tuxen to allow for stream prioritization
  - But it is not standardized yet
    - Therefore we can not recommend it

Channel 1: High Prio, Reliable

- Used for
  - Configuration from CE to FE and responses from FE to CE
  - Query from CE to FE and responses from FE to CE
  - Some class of events
    - High priority alarms

Channel 2: Medium Prio, Semi-reliable

- SCTP allows you to semantically say
  - “Please send this message but obsolete it if you are unable to deliver it in 100ms”
- Used for
  - Events that are obsoleted over time

Channel 3: Low Prio, Unreliable

- Used for redirects from FE to CE
  - Some control protocols are reliable end to end
  - Some control protocols prefer obselence of messages over retransmissions
- Can be used for some other FE events that we can afford to loose because we can recover
    - Example some counters emitted synchronously

Implementation example

TML Parameterization

```
<FEM_CONFIG>
....
      <TML>
            <DEFAULT_TML>sctp</DEFAULT_TML>
      </TML>
      <CE_CONFIG>
            <CE>
                  <PID>0x40000001</PID>
                  <ADDRESS>169.254.100.1</ADDRESS>
                  <HPORT>6700</HPORT>
                  <MPORT>6701</MPORT>
                  <LPORT>6702</LPORT>
            </CE>
            <CE>
                  <PID>0x40000002</PID>
                  <ADDRESS>169.254.100.2</ADDRESS>
                  ....
            </CE>
      </CE_CONFIG>
....
....
</FEM_CONFIG>
```

TML Interface: Callback interface

```
struct tml_target {
        char name[TML_NAME_SIZE]; //name of TML
        uint8_t version; //version of TML
        // PL invoker passes callback function to
receive msgs
        int (*open)(... (*listen_func)(int, int, void *, void
*), void *arg);
        int (*close)(unsigned long);
       // send packet via TML
        int (*send)(unsigned long, void *, int);
        // config/query things about TML
        int (*ioctl)(unsigned long, void *, void *);
};
```

PL-TML Bootstrap

- PL boots up and gets the TML name from xEM config
- PL scans for TML by name in libpath
- TML found
  - Load callback structure
  - Ready to use
- TML not found
  - Exit

Remote TML Bootstrapping

- PL calls TML open()
  - TML reads its xEM config parameters and connects via three sockets
- On success PL gets a filedesc
  - PL uses filedesc for ForCES communication
    - TML send() api calls
- On failure to connect to all endpoints an error code/filedesc is returned

Misc TML-PL API

- close() used to close connection between PL-TML
- ioctl() to issue control to the TML
  - example map PL message type to channel
- callback function passed in open() used to invoke PL from TML
  - arriving packets
  - events