RoE Link Setup

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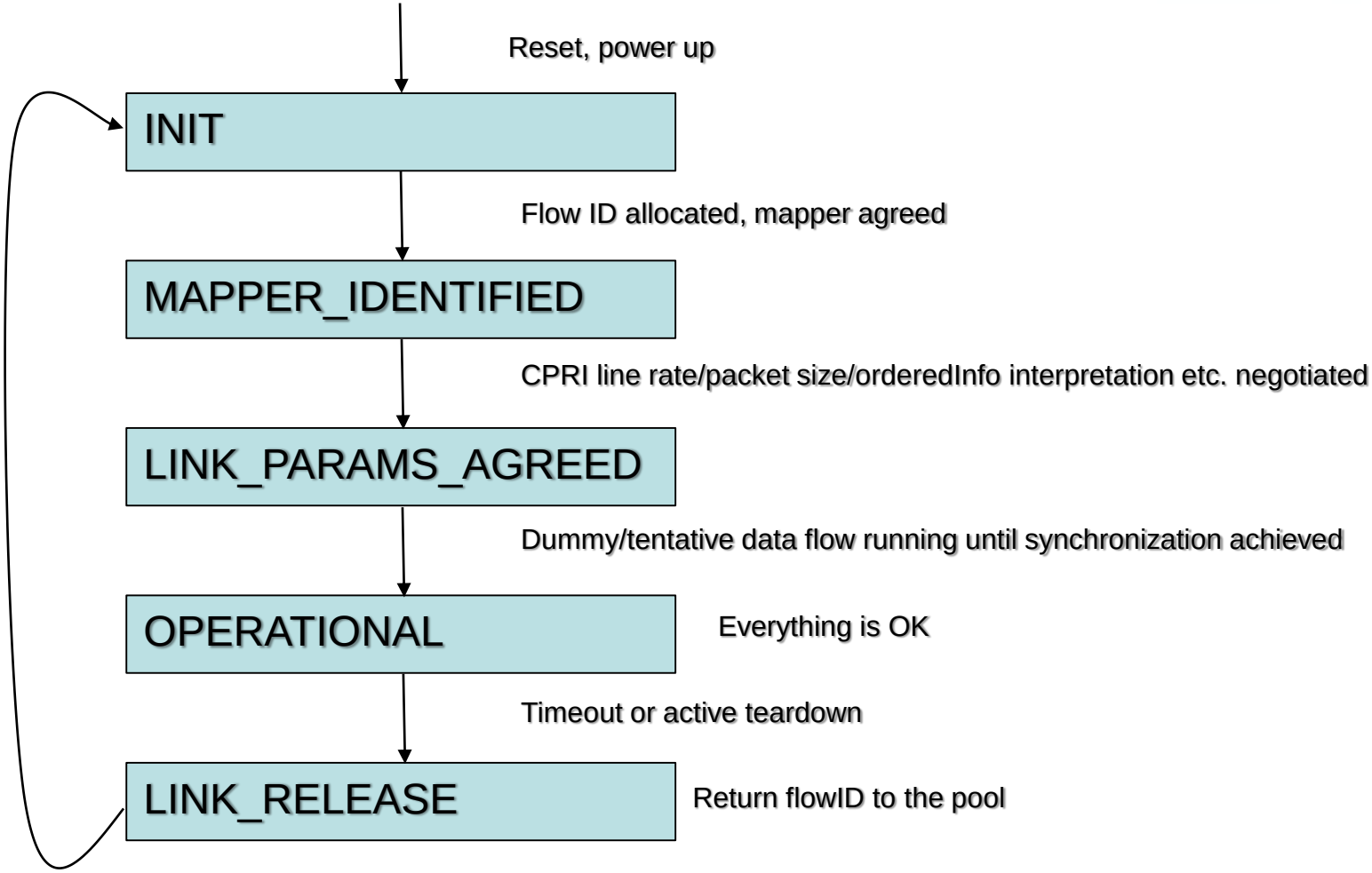
Background

- Discussed in a couple of biweekly calls
- Previous slides for discussion posted at:
  - http://www.ieee1904.org/3/email/msg00422.html
  - http://www.ieee1904.org/3/email/msg00446.html
- Deck should possibly be called “RoE Flow Setup”

Link setup in RoE - requirements

- Allocation of flowid(s)
- Selection of RoE Mapper
- Selection of orderedInfo field interpretation
- If used, selection of seqnum parameters
- Teardown/link release process
- Maximum packet delay measurement and reporting process

Strawman Link Setup State Diagram



This needs to be broken down into state diagrams for each end of the link

RoE Link Setup proposal

- Assume that higher layer entity has identified the two endpoints outside RoE
  - Implies no broadcast discovery phase to link setup – no DHCP equivalent
  - Control packets defined in draft as "Control packet between two RoE endpoints" – not one to many
- Assume that "role" (e.g. priority for protocol resolution) is a local variable configured at e.g. deployment.

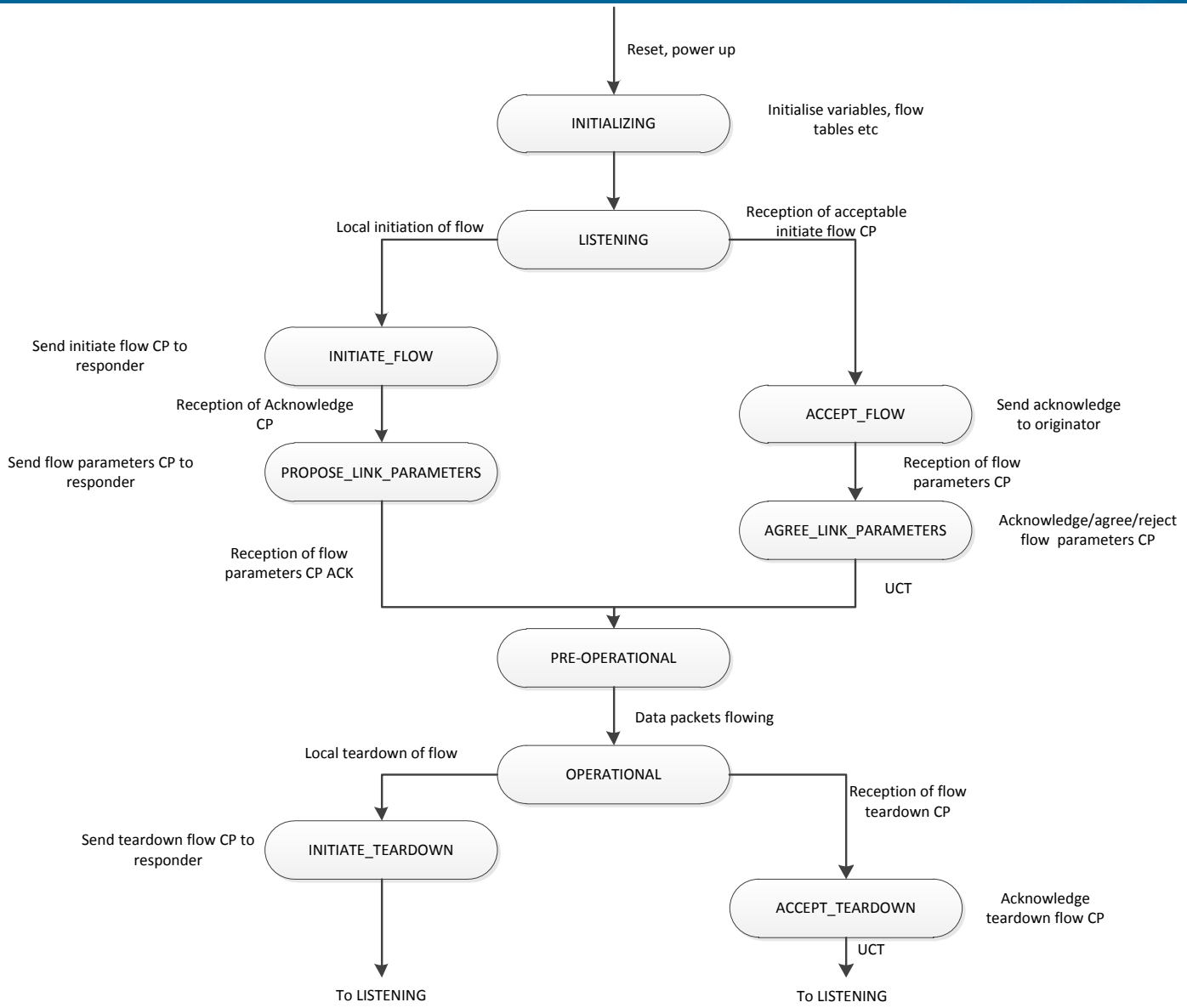
RoE Link Setup proposal

- Step 1: Flow creation
  - Uses pktType == 0x00 (Control Packet), FlowID == 0xFF, new subtype
  - Originator endpoint requests a mapper and a flowID
  - Responder endpoint simply accepts or rejects
- Step 2: Mapper-specific setup
  - Uses pktType == 0x00 (control Packet), FlowID == agreed in step 1, new subtype
  - For CPRI links, agree line rate
    - use bitfields as per current CPRI spec?
  - Use of seqnum vs timestamp
    - Is this implicitly defined by mapper type?
  - If seqnum used, agree p and q values
  - Maximum Packet Delay estimation?

Flow setup/teardown control packets

- Allocate a control packet subType in 8.5.6
  - Suggest 0x000011 since it is next in line
- Each flow setup/teardown control packet between any two endpoints increments the sequence counter in orderingInfo
- (nit-picking aside: D0.4 says that both types of orderingInfo are generated by the mapper - but now not all control packets originate in a mapper)

Flow Setup State Diagram



“Initiate Flow” packet

Field	Bits	Description
ver	2	0b00
pktType	6	0b000000 Control
flowID	8	NIL 0xFF
length	16	As per draft
orderingInfo	32	seqNum interpretation
subtype	8	0b00000011 – Flow Setup
flowSetupPktType	8	0b00000001 – Initiate Flow
proposedFlowID	8	Flow ID proposed for setup
proposedMapper	8	Same coding as pktType, right-justified

“Flow Parameters” packet

Field	Bits	Description
ver	2	0b00
pktType	6	0b000000 Control
flowID	8	flowID being configured
length	16	As per draft
orderingInfo	32	seqNum interpretation
subtype	8	0b00000011 – Flow Setup
flowSetupPktType	8	0b00000010 – Flow Parameters
…		Mapper-specific parameters
…		

“Acknowledge” packet

Field	Bits	Description
ver	2	0b00
pktType	6	0b000000 Control
flowID	8	NIL 0xFF (for Initiate Flow ACK) Flow ID (for other ACKs)
length	16	As per draft
orderingInfo	32	seqNum interpretation
subtype	8	0b00000011 – Flow Setup
flowSetupPktType	8	0b00000000 – Acknowledge
response	8	0 – OK, anything else – not OK
seqNumAck	32	Control packet sequence number that is being acknowledged (may be redundant)

“Teardown Flow” packet

Field	Bits	Description
ver	2	0b00
pktType	6	0b000000 Control
flowID	8	flowID to be released
length	16	As per draft
orderingInfo	32	seqNum interpretation
subtype	8	0b00000011 – Flow Setup
flowSetupPktType	8	0b00000011 – Teardown Flow

Timeout

- Entry to each state except LISTENING and OPERATIONAL starts a timer
- Timer initial value is a per-node variable
  - We can define a default but may need to be adjusted
- Expiration of timer discards the partially configured flow and moves the node back to the LISTENING state

Holes

- "3rd Party" flow initiation
  - Could be easily layered on top of this proposal
- "Reverse" flow setup
  - Direction field in InitiateFlow/TeardownFlow packet?
- Race lurking in seqNum interpretation
  - What if both ends try to initiate a flow at the same time?
- No mechanism to establish and communicate max packet delay
  - Will define move from PRE-OPERATIONAL to OPERATIONAL
- No flow status monitoring/reporting

Motion

- Approve the proposal for RoE link setup as described in tf3_201604_edwards_link_setup_1.pdf pages 5-13
- Moved: Gareth Edwards
- Seconded:

- Technical motion (≥2/3)

- Yes:__, No:__, Abstain:__