

ForCES Implementation Experience

IETF – 76 Hiroshima

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Summary

- Document Goal.
- ForCES Architecture.
 - Pre-association setup.
 - TML.
 - Model.
 - Protocol.
- SCTP Development Platform.
- What's next?

Document goal

- Help developers implement by
 - Capturing the implementation experience of the Protocol, Model & Sctp-tml.
 - Providing Ideas and Proposals for implementation.
 - Mentioning possible problems and choices.

ForCES Architecture

Pre-Association Setup

- Managers should at least exchange the following info:
 - ❑ CE/FE ID.
 - ❑ CE/FE IP.
 - ❑ TML. If no TML is set, then SCTP chosen as default.
 - ❑ Priority ports.

ForCES Architecture - TML

- Sctp-TML is mandatory.
- Issues for the TML:
 - Security.
 - NAT issues for priority ports.

ForCES Architecture – Model

- Statement: Model is very dynamic.
- Goal: Scalable implementation of new LFBs.
- Solution: Inheritance.

ForCES Architecture – Model (2)

Components.

■ Common Parameters:

- ❑ ID.
- ❑ Access Right.
- ❑ If it is Variable Length.
- ❑ If it is Optional
- ❑ Data Size.

ForCES Architecture – Model (2)

Components (2).

■ Common Functions:

- Constructor/Deconstructor.
- Get Parameter Values.
- Get/Set/Del Full/Sparse Data.
- Get/Set/Del Hardware Value.
- Get Data.
- Clone Component.

ForCES Architecture – Model (2)

Components (3).

- Any Atomic Component can be built as a child of the basic component.
- A Struct Component is a component
 - Contains a static array of Components.
 - The ID of the inner component is the array index.
 - Clone Function returns same struct.
- An Array Component
 - For each Row have a mother Component.
 - For a new Row, Clone Component from mother.

ForCES Architecture – Model (3)

LFBs (1).

- Same Concept.
- Common Properties.
 - LFB Class ID.
 - LFB Instance ID.
 - Array of Components.
- Common Functions.
 - Handle Config/Query Command.
 - Get Class/Instance ID.
- For an FE it is required an array of LFBs.

ForCES Architecture – Model (3)

LFBs (2) - Example.

```
//FEID
cui = new Component_uInt(FEPO_FEID, ACCESS_READ_ONLY, FE_id);
Components[cui->get_ComponentId()]=cui; //Add component

//Current FEHB Policy Value
cub = new Component_uByte(FEPO_FEHBPolicy, ACCESS_READ_WRITE, 0);
Components[cub->get_ComponentId()]=cub; //Add component

//FEIDs for BackupCEs Array
cui = new Component_uInt(0, ACCESS_READ_WRITE, 0);
ca = new Component_Array(FEPO_BackupCEs, ACCESS_READ_WRITE);
ca->AddRow(cui, 1);
ca->AddMotherComponent(cui);
Components[ca->get_ComponentId()]=ca; //Add BackupCEs Array component
```

ForCES Architecture – Protocol

- Statements:
 - Protocol messages are very dynamic.
 - Batching messages.
 - Multiple Selects/Operations/Component Targets within one message.
- Goal: Scalable architecture for handling all messages.
- Solution: Inheritance.

ForCES Architecture – Protocol (2)

- All protocol message have a:
 - Header
 - Rest of Packet (Data)
 - Divided in TLVs
 - Only one case of ILVs (Sparse Data).

ForCES Architecture – Protocol (3)

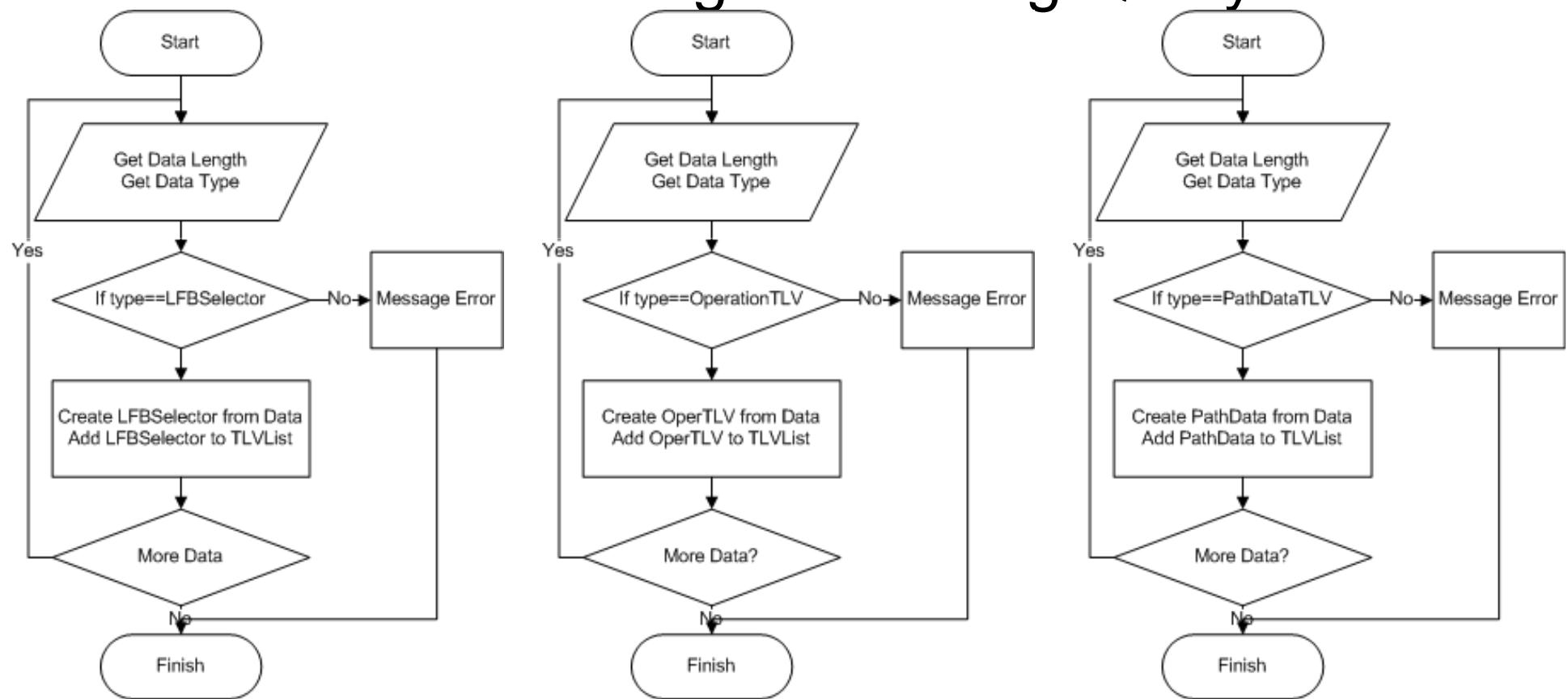
TLV (1)

- Common TLV Attributes
 - Type
 - Length
 - Data
 - Array of TLVs.
- Common Functions
 - Constructor/Deconstructor
 - Add/Get/Replace TLV of next Level
 - Get/Set Data
 - Get/Set Type
 - Get Length
 - Serialize/Deserialize TLV

ForCES Architecture – Protocol (3)

TLV (2)

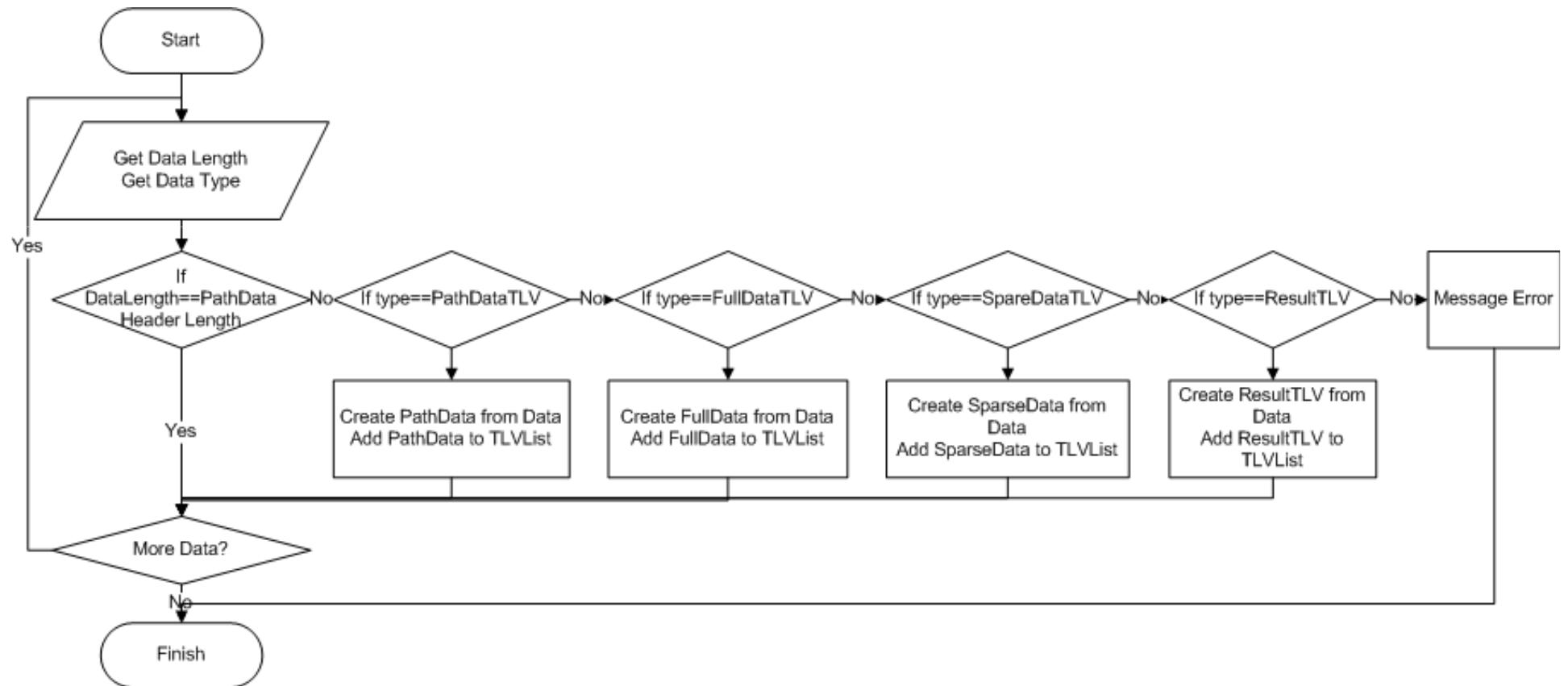
■ Deserialize Message for Config/Query.



ForCES Architecture – Protocol (3)

TLV (3)

■ Deserialize PathData TLV.



SCTP Development Platform

Platform ----- Language	Windows	Linux	Solaris
C/C++	Supported	Supported	Supported
Java	Limited Third Party Not from Sun	Supported	Supported

What's next?

- Request to be added as WorkGroup Document.
- Request for Comments.
- Goal: To become an informational RFC.
- Change to Implementation Guidelines?