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?
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.
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 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.
All protocol messages 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
Deserialize Message for Config/Query.

- Start
- Get Data Length
- Get Data Type
- If type==LFBSelector
  - No: Message Error
  - Yes: Create LFBSelector from Data
  - Add LFBSelector to TLVList
  - More Data?
  - Yes: Continue
  - No: Finish

- Start
- Get Data Length
- Get Data Type
- If type==OperationTLV
  - No: Message Error
  - Yes: Create OperTLV from Data
  - Add OperTLV to TLVList
  - More Data?
  - Yes: Continue
  - No: Finish

- Start
- Get Data Length
- Get Data Type
- If type==PathDataTLV
  - No: Message Error
  - Yes: Create PathData from Data
  - Add PathData to TLVList
  - More Data?
  - Yes: Continue
  - No: Finish
ForCES Architecture – Protocol (3)

TLV (3)

- Deserialize PathData TLV.

Start

Get Data Length
Get Data Type

Yes

If DataLength == PathData Header Length

No

If type == PathDataTLV

No

If type == FullDataTLV

No

If type == SpareDataTLV

No

If type == ResultTLV

No

Message Error

Create PathData from Data
Add PathData to TLVList

Create FullData from Data
Add FullData to TLVList

Create SpareData from Data
Add SpareData to TLVList

Create ResultTLV from Data
Add ResultTLV to TLVList

More Data?

Yes

No

Finish
## SCTP Development Platform

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<tr>
<th>Platform -------------------\ Language</th>
<th>Windows</th>
<th>Linux</th>
<th>Solaris</th>
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What’s next?

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