ForCES LFB Subsidiary Management

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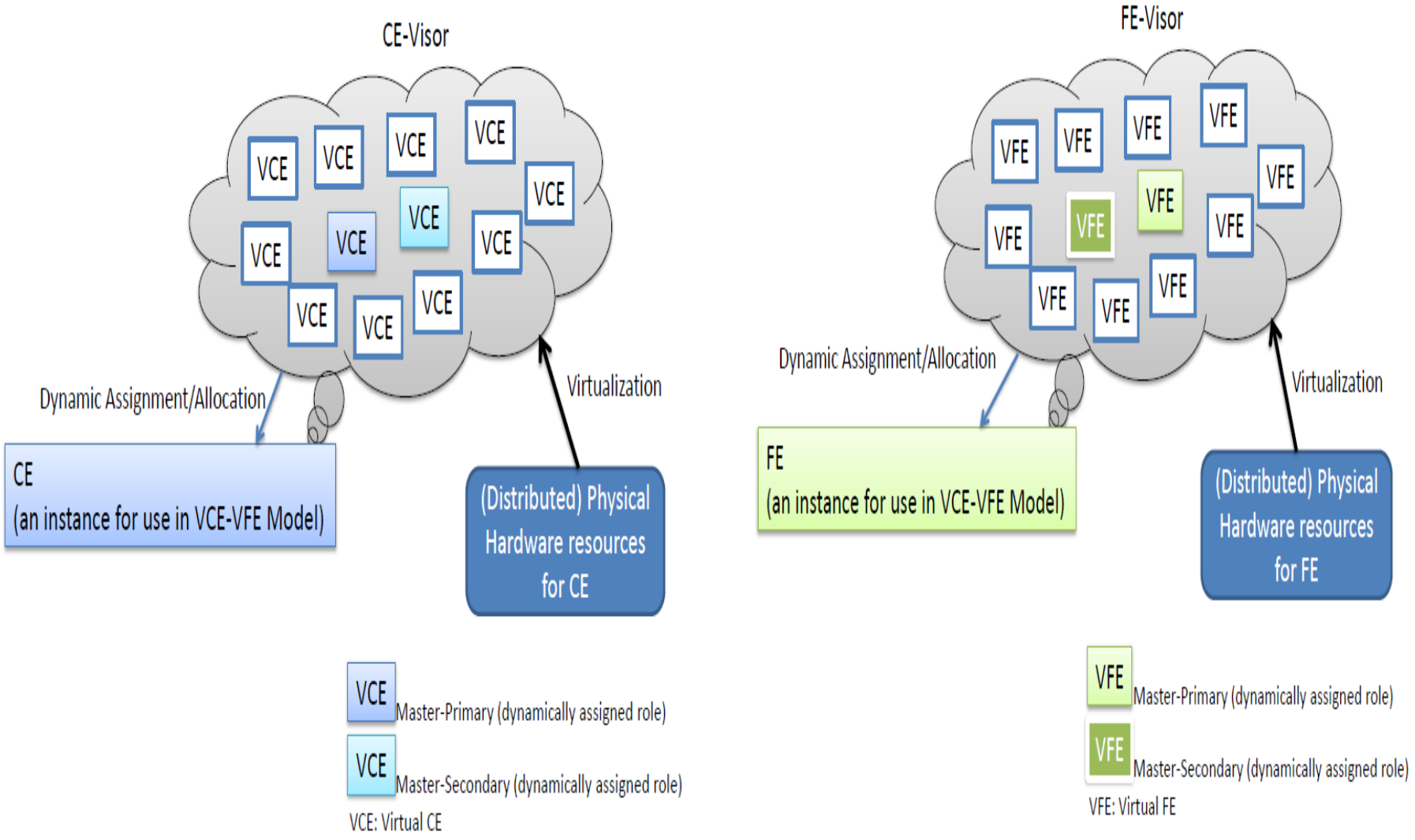
Background

- Per the updated ForCES charter (http://datatracker.ietf.org/wg/forces/charter/), the LFB Subsidiary Management work is within the scope
  - Deployment experience has demonstrated the value of using ForCES to control the **Forwarding Element Manager (FEM)** by creating an LFB to represent its function using the same encoding rules as for any other LFB. This allows it to be controlled by the same **Control Element (CE)**
  - This work item assumes the **presence of an initially booted FE** whose configuration could then be **updated** at runtime via an FEM LFB for runtime config purposes (e.g., by adding a new CE and its associated IP address).
  - This work item can also be useful in addressing **control of virtual FEs** where individual FEM Managers can be addressed to control the creation, configuration, and resource assignment of such virtual FEs within a physical FE
  - This work would result in a standards track LFB FEM library RFC

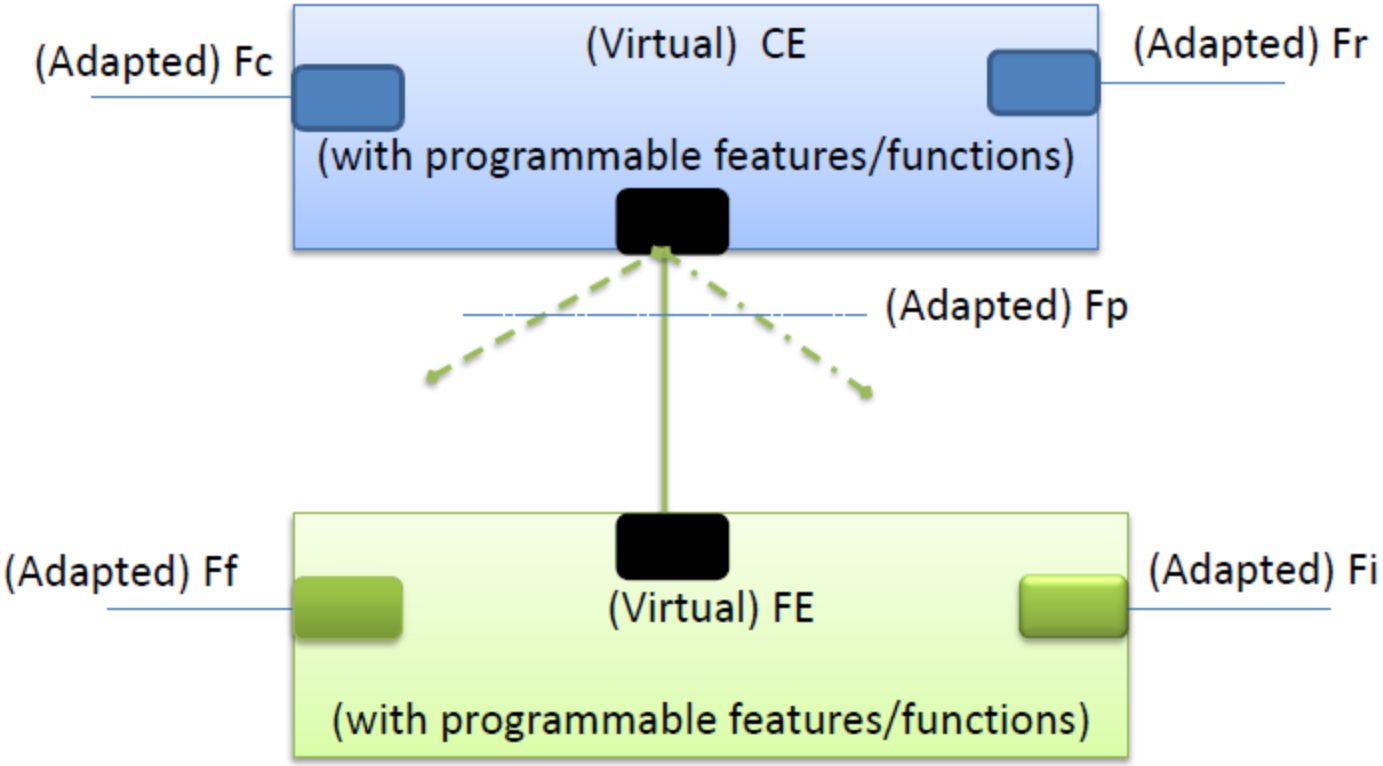
Outline

- Virtualization of CE and FE
- Updated ***V***CE-***V***FE Model
- A Preliminary Scenario
  - Sequence of Events in FEM
  - Implementation Option(s)
- Another Potential Scenario
  - Sequence of Events
- Next Step(s), Q&A, and Discussion
- THANKS!

Virtualization of CE and FE



Updated *V*CE-*V*FE Model



A Preliminary Scenario

(Recovery from FE Failure)

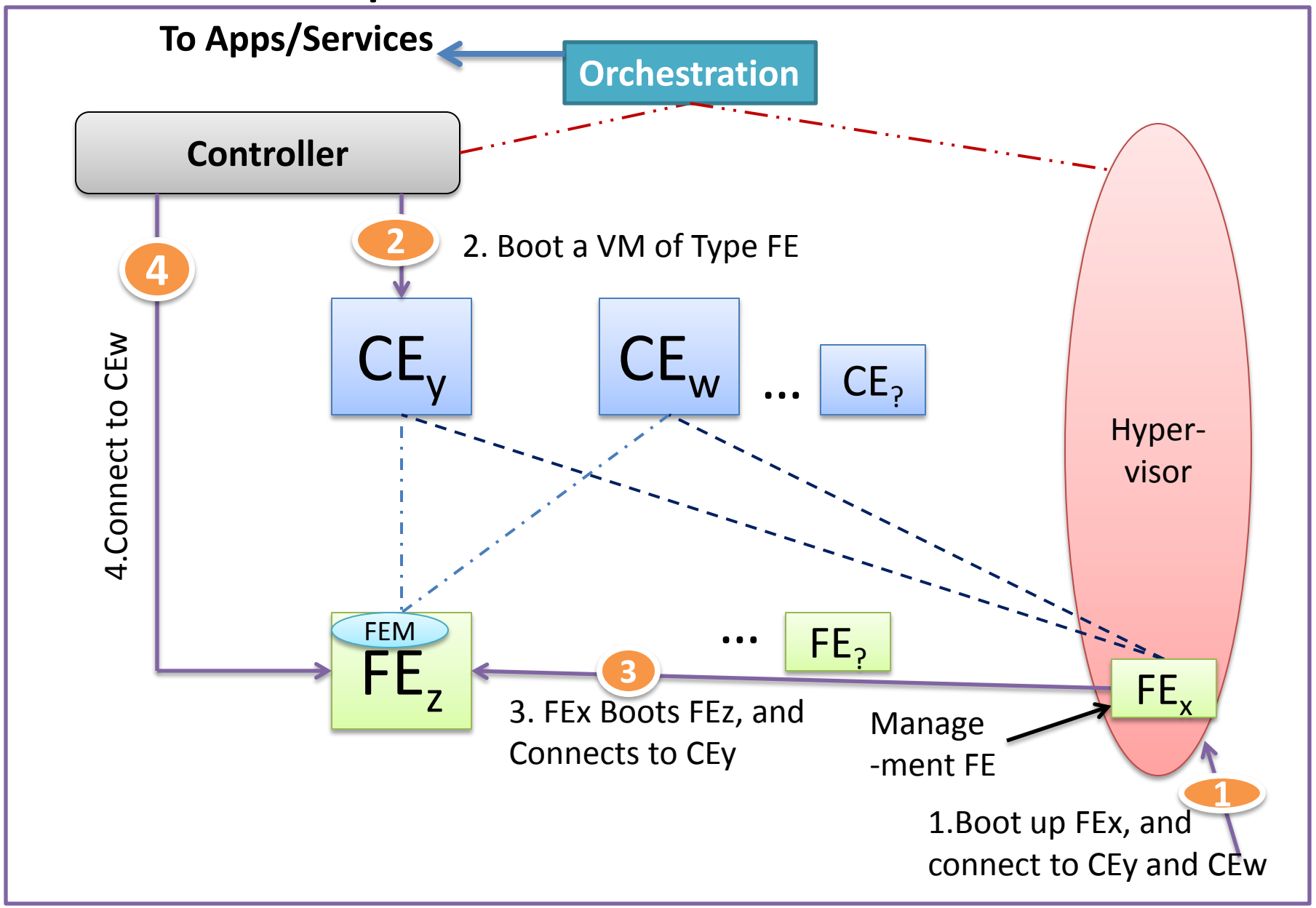
- An **FE** can initially boot using a default **A**ssociation and **C**onfiguration
  - The **A** & **C** can be updated at runtime via an FE-Visor/FEM LFB for runtime configuration purposes
    - For example, by adding a new CE and its associated IP address
- A **CE** can initially boot using a default **C**onfiguration and **S**tate(s)
  - The **C** & **S** can be updated at runtime via a CE-Visor/CEM LFB to satisfy runtime requirements

Sequence of Events in FEM
(an example)

- Step-1: Hypervisor boots up with FEx that connects to a CEy and CEw
- Step-2: Control App (attached to CEy) instructs FEx to boot an FE-type VM
- Step-3: FEx boots FEz and instructs it to connect to CEy
- Step-4: Control application instructs FEz to also connect to CEw
  - this is essentially the "A" part of A&C, as discussed in slide no. 6 (Potential Scenarios)
- Step-5: Control application instructs FEz to increase its syslog debug level
  - essentially this is the "C" part of A&C, as discussed in slide no. 6 (Potential Scenarios)

Step-4 (FEM part of the charter) and Step-5 are what we would like to achieve

Sequence of Events in FEM



Implementation

- Please see the demo during Bits-N-Bites session on Thursday, 7 Nov. 2013 at 7 PM in Regency D/E/F
  - Looking for further inputs/suggestions

Another Potential Scenario

(Recovery from CE Failure)

- A **CE** can initially boot using a default **A**ssociation, **S**tate, and **C**onfiguration
  - The **A** & **C** can be updated at runtime via a CE-Visor/CEM-LFB for runtime configuration purposes
    - For example, by adding a new CE and its associated IP address
- An **FE** can initially boot using a default **C**onfiguration, **A**ssociation (with a CE) and **S**tate
  - The **C** & **A** can be updated at runtime via a FE-Visor/FEM LFB to satisfy runtime requirements

Sequence of Events (an example)

- CEx is Active with CEy as its Standby with Standby/Active or Active/Active setup
- CEx controls FEy and FEw with both FEy and FEw having Standby control links to CEy (with Standby/Active or Active/Active setup)
  - CEx and CEy are controlled (assigned) by CE-visor, and may have a common (virtual) IP address
  - The Controller is fully aware of the status of all of the CEs – physical and virtual
- When CEx fails, its states are fully transferred (may already be synced) to CEy
  - The Standby links from CEy to FEy and FEw become fully active
  - The control (of FEy and FEw) is fully transferred from CEx and CEy
- Graceful/smooth failover of CEx to CEy is now successfully complete, and SysLog debug level for CEy is increased

The last two steps are concerned with Subsidiary management

Implementation

- In progress, looking for inputs/suggestions

Next Steps

- **Continue preparing the draft**
  - **Welcome Contributions/Participations from others**

- **Comments/Suggestions**

Q&A, and Discussion

THANKS!

Misc. Additional Information

Application and Orchestration

- Applications can adapt based on
  - Loading and Recovery status
  - Pre- and post-condition(s)
  - Other Requirements

- Orchestration
  - Multiple CE/VCE scenarios
  - Handling of Bursts and/or Multiple Conflicting Requests from the Apps/Services

CE/FE/LFB Life Cycle Management