ForCES nvo3
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NVO3 WG

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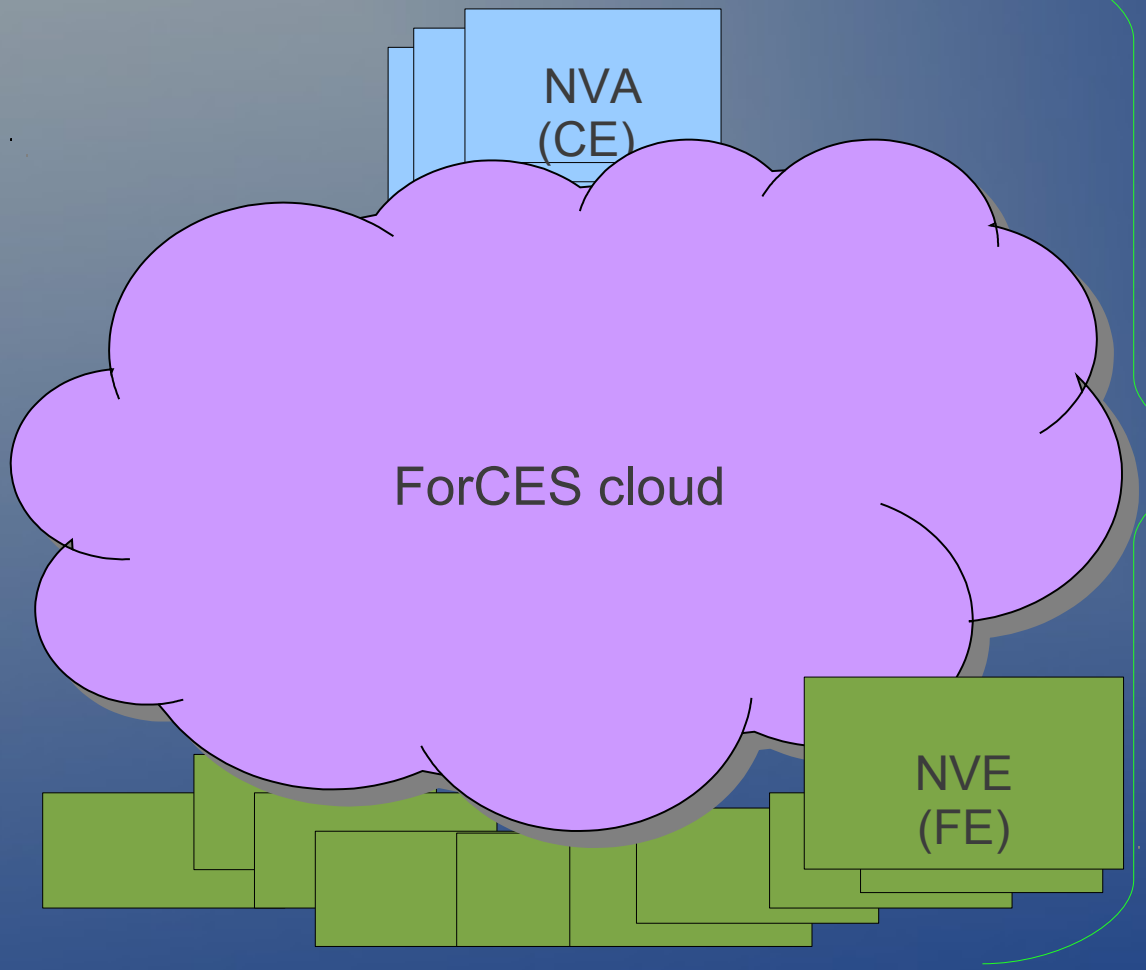
ForCES: Functional scope



- Network Element (NE)
  - Packet Processing Entity
    - Constitutes CEs and FEs
      - Multiple CEs to FE for HA
      - CE/FE Physical or virtual

- NE components distributed
  - Local within box/rack/room
  - Geographicaly distributed
    - Within rooms/buildings
    - Across the internet

ForCES Architecture In A Nutshell

- A binary protocol (The *Verbs*)
  - A modular transport for the protocol
- A data model (The *nouns*)
  - Logical Functional Block constructs
- Combine the above and you have a language
  - [<*verb*> <*noun*> [args]]+
    - Few verbs but infinite possibilities of nouns

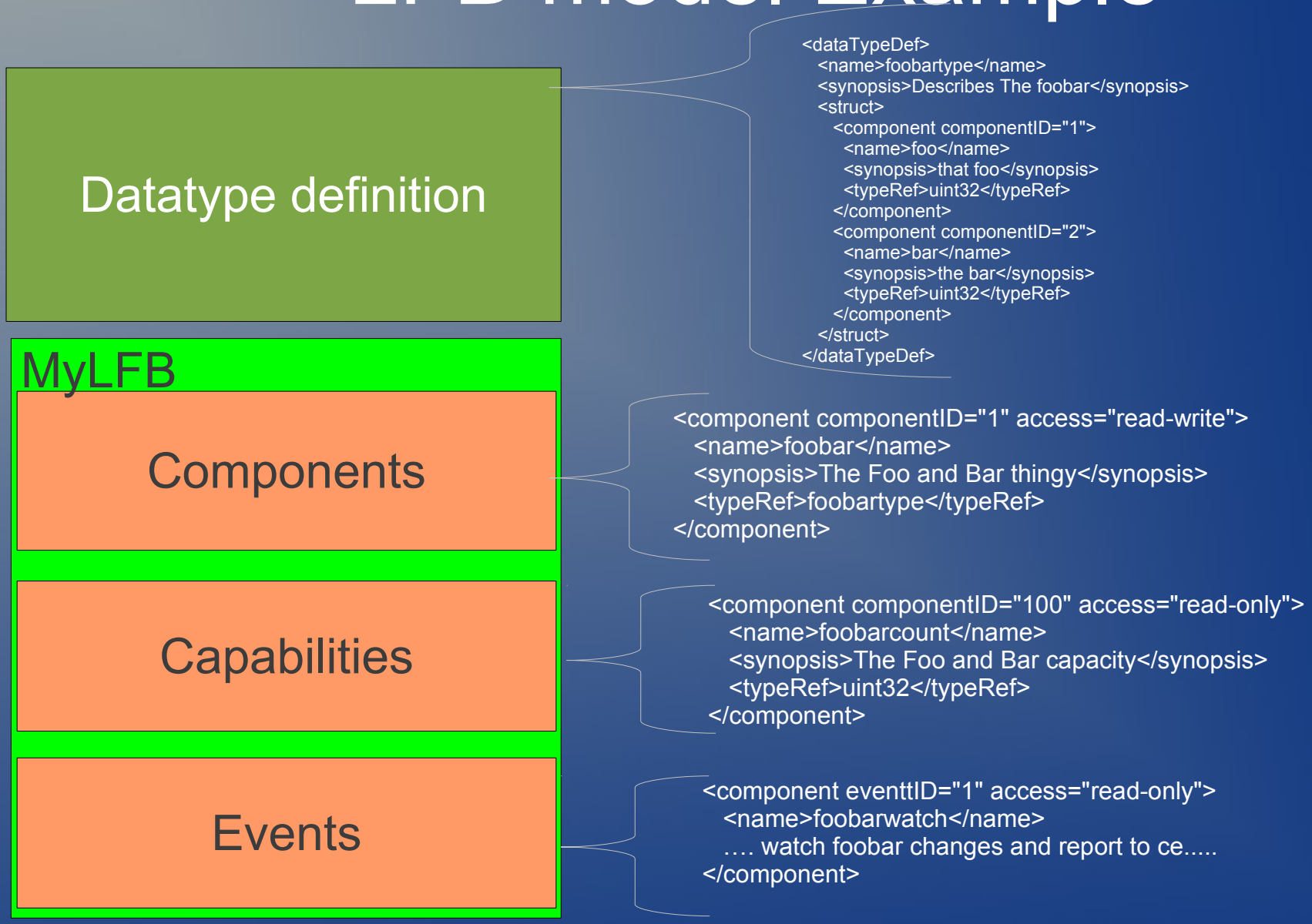
Protocol Semantics

- Simple Verbs
- Transactional capability (2PC)
- Various Execution modes
- Scalability via batching and command pipeline
- Security
- Traffic Sensitive Heartbeating
- High Availability

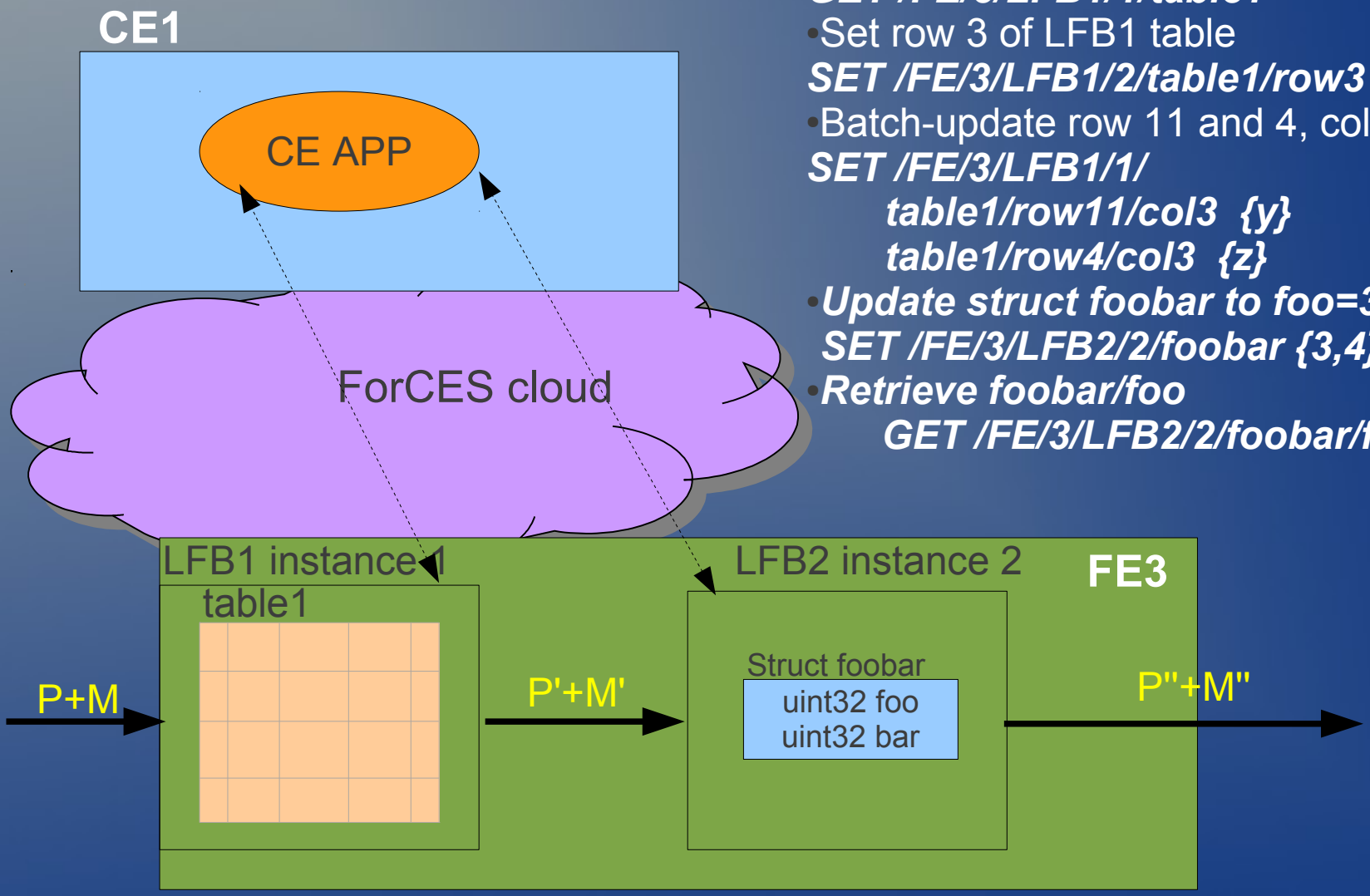
Data Modeling

- Based on XML (RFC 5812)
- Respect for backward and forward compat
  - Let the CE deal with disparate versions
- Main constructs
  - *Datatype:* definitions used by LFBs
  - *LFB Classes*: Basic packet processing entity
    - *Components:* Control entities a CE is aware of
    - *Capabilities:* define LFB capabilities
    - *Events:* define events that an LFB can generate

LFB model Example



General Control Example



- Dump the LFB1 table

GET /FE/3/LFB1/1/table1

- Set row 3 of LFB1 table

SET /FE/3/LFB1/2/table1/row3 {a,b,c,d}

- Batch-update row 11 and 4, col 3 of the LFB1 table

SET /FE/3/LFB1/1/
table1/row11/col3 {y}
table1/row4/col3 {z}

- ***Update struct foobar to foo=3, bar=4***

SET /FE/3/LFB2/2/foobar {3,4}

- ***Retrieve foobar/foo***

GET /FE/3/LFB2/2/foobar/foo

Meeting nvo3 NVA/NVE requirements

- Less complex
  - Not a protocols menu (OF, netconf, ovsdb etc)
  - Extensible API based on model definition
    - CLI or control apps get a consistent interface
    - Agnostic whether we target over/underlay
    - Future revision require changes only in the model
    - Backward and forward compatibility built in
- Built in VNE High Availability support

Meeting nvo3 NVA/NVE requirements

- Efficient protocol (binary)
  - Designed to be fast and scale
    - thousands of NVEs
    - Millions of VNIs
    - Fast updates
      - Bulk table creates/updates/deletes/gets
      - In the 10-100K table updates per second possible
    - Fast acquisition of state and events distribution

Meeting nvo3 NVA/NVE requirements

- A data model (The *nouns*)
  - Can model variety of VNE types and constructs
    - Mapping tables
    - Scalar control knobs
  - Events vs redirects
    - Send control BPDUs to VNA
    - Send events or whole frames to VNA for policy decisions
  - Capacity and capability definitions
    - VNE type capabilities
    - Table and other capacity advertisement

Bits n Bites etc

- At this meeting there is a demo with Vms, virtual switches etc
  - Come to the ForCES meeting next session
  - Come to the bits and bites session thursday