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Platform Management with SA Forum and its Role to Achieve High Availability

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AdvancedTCA Summit

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SA Forum Introduces Platform Management

- SA Forum with Release 6 (21 October 2008) announces a new service for Platform Management (PLM)
- Why is PLM necessary?
  - SAF HPI provides HW access
  - SAF AIS provides availability management for software (e.g. redundancy)

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Tasks of SA Forum Platform Management

- PLM provides a bridge between HW-view and configured software view
- PLM connects the AIS information model with the discovered HW
- PLM provides administrative operations and configuration of hardware objects

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Introduction to Platform Management: Hardware Discovery and Configuration

- SA Forum Hardware Platform Interface (HPI) allows standard access to any type of hardware.
  - Hardware discovery
  - HPI events notify on changes
  - HPI user must do complex analysis for health checking
- HA Middleware provides sophisticated redundancy models that need detailed configuration
  - AIS Configuration must be mapped on discovered hardware
  - Discovered hardware must match the configuration

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PLM Information Model

- PLM provides object classes in the SA Forum information model:
  - Hardware Element (HE)
  - Execution Environment (EE)
- Administrators need to provide object instances, modeling the view on the hardware.
  - E:g. create an instance “blade23”, or “disk7”, that identifies these to the software.
- PLM service maintains a state model on these objects.
  - Objects can be configured, while the hardware is not

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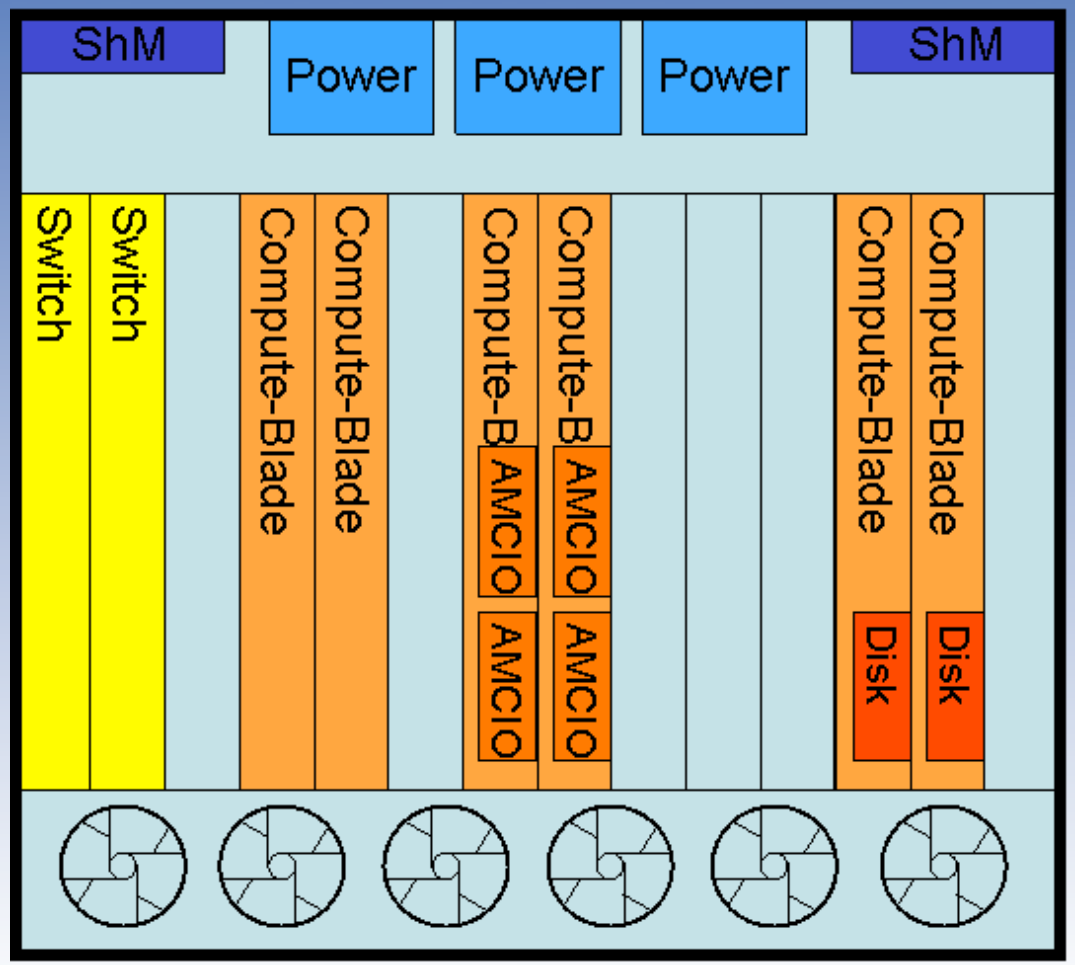
Example for Containment Tree representing an ATCA Shelf



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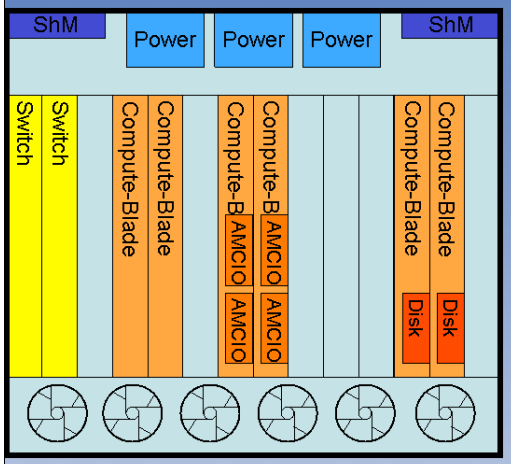
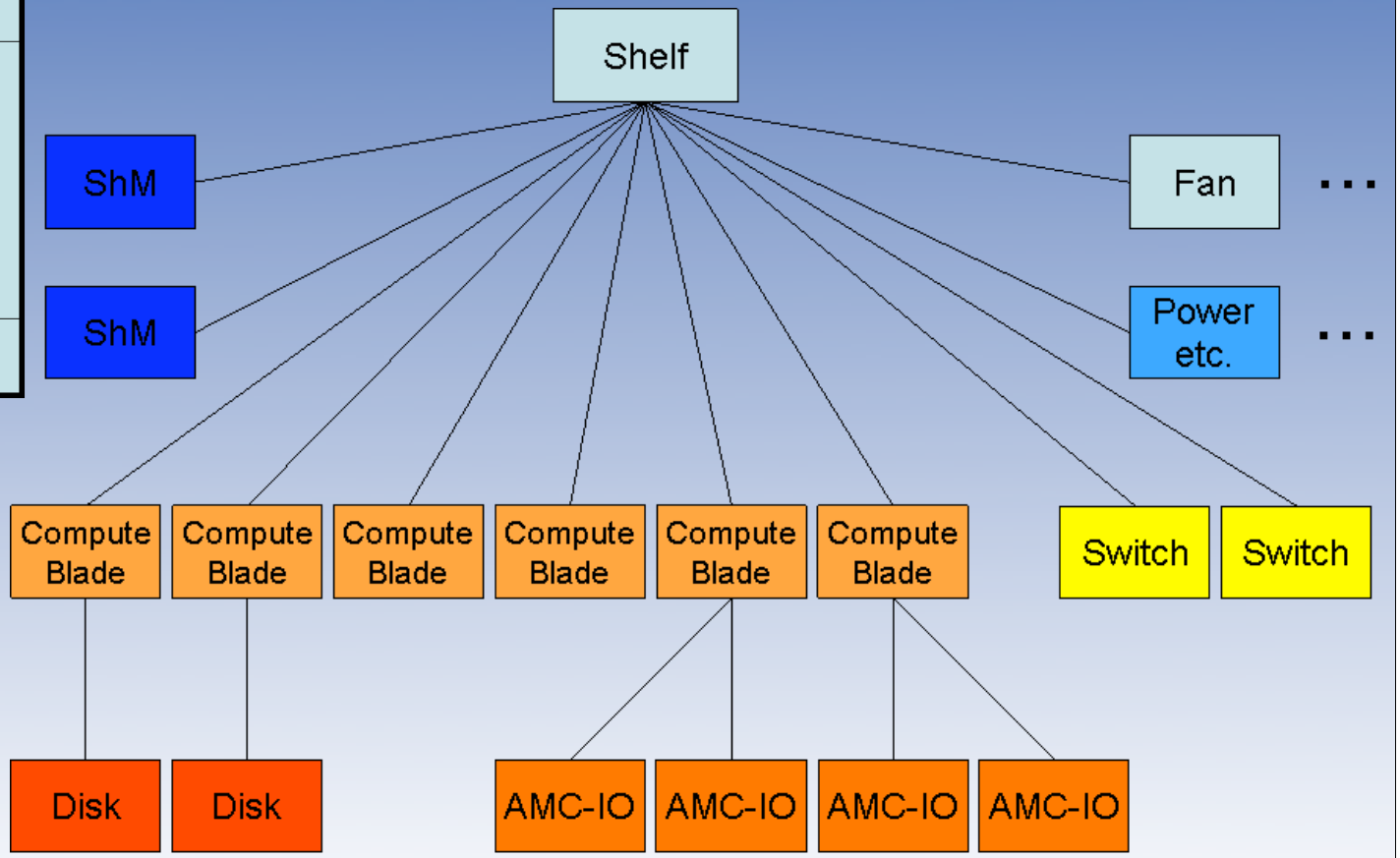
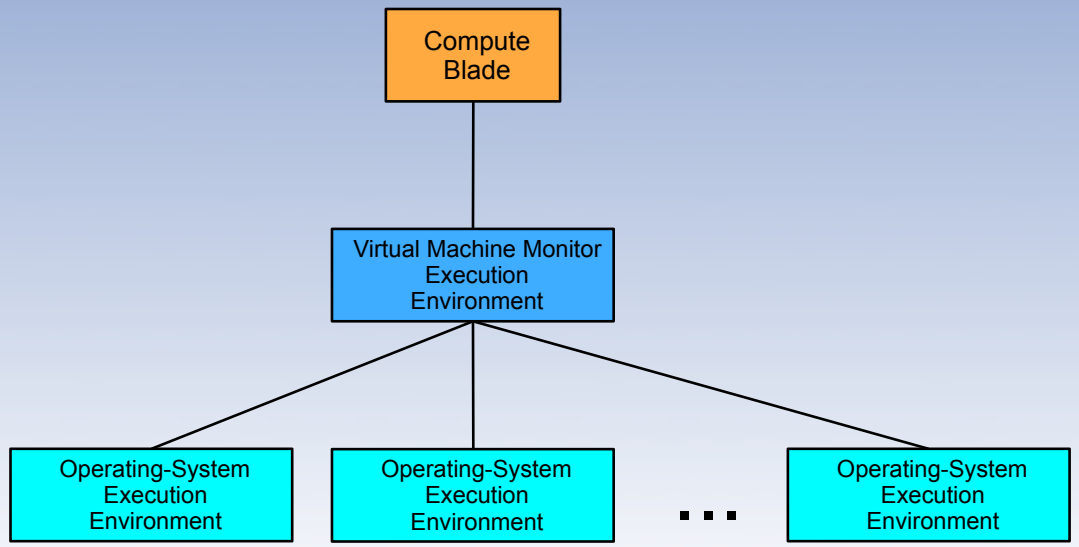


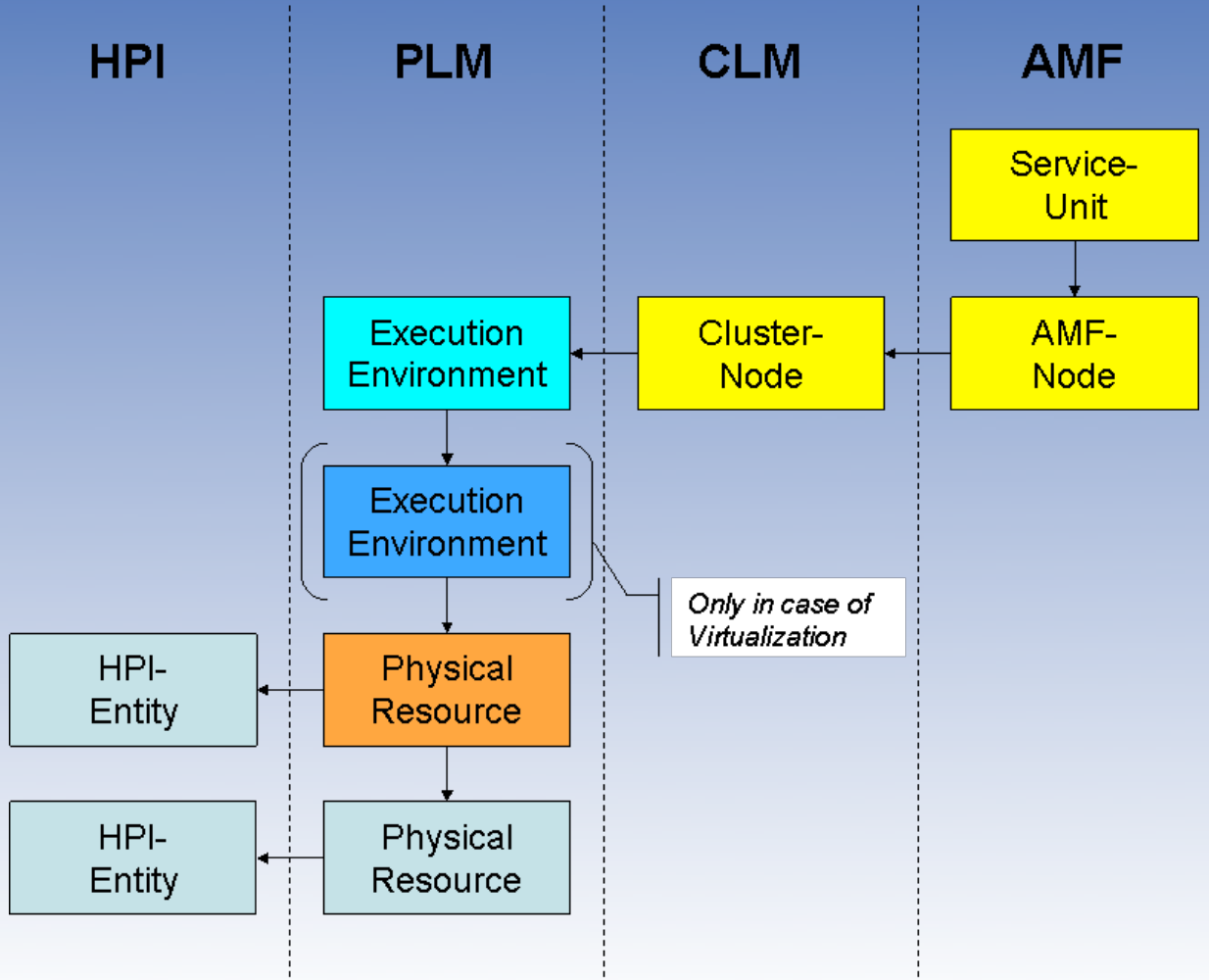


Information Model for Virtualization and Operating System

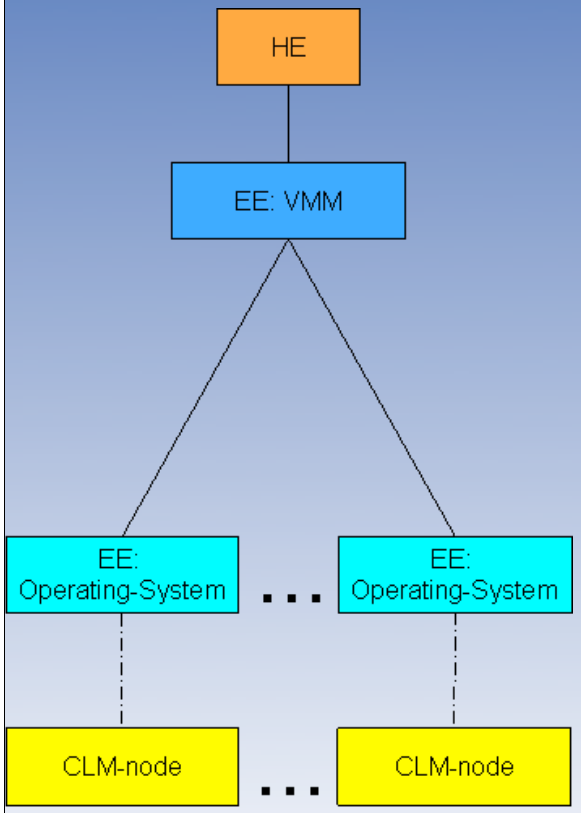
- PLM represents Virtualization and Operating Systems with EE Objects
- EE Objects are children of the hardware they are running on



Using HE and EE objects, PLM links AIS logical entities on Hardware



Modeling different Virtualization Architectures



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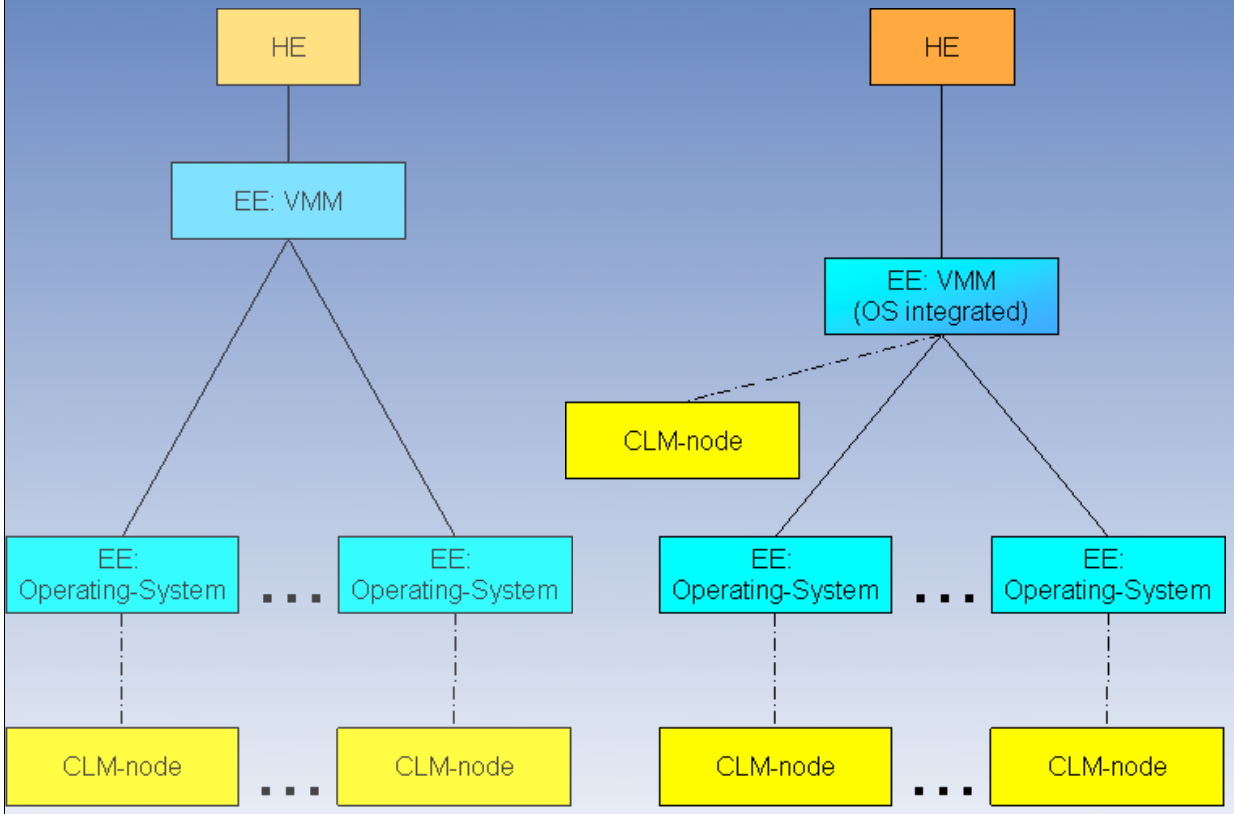
Modeling different Virtualization Architectures



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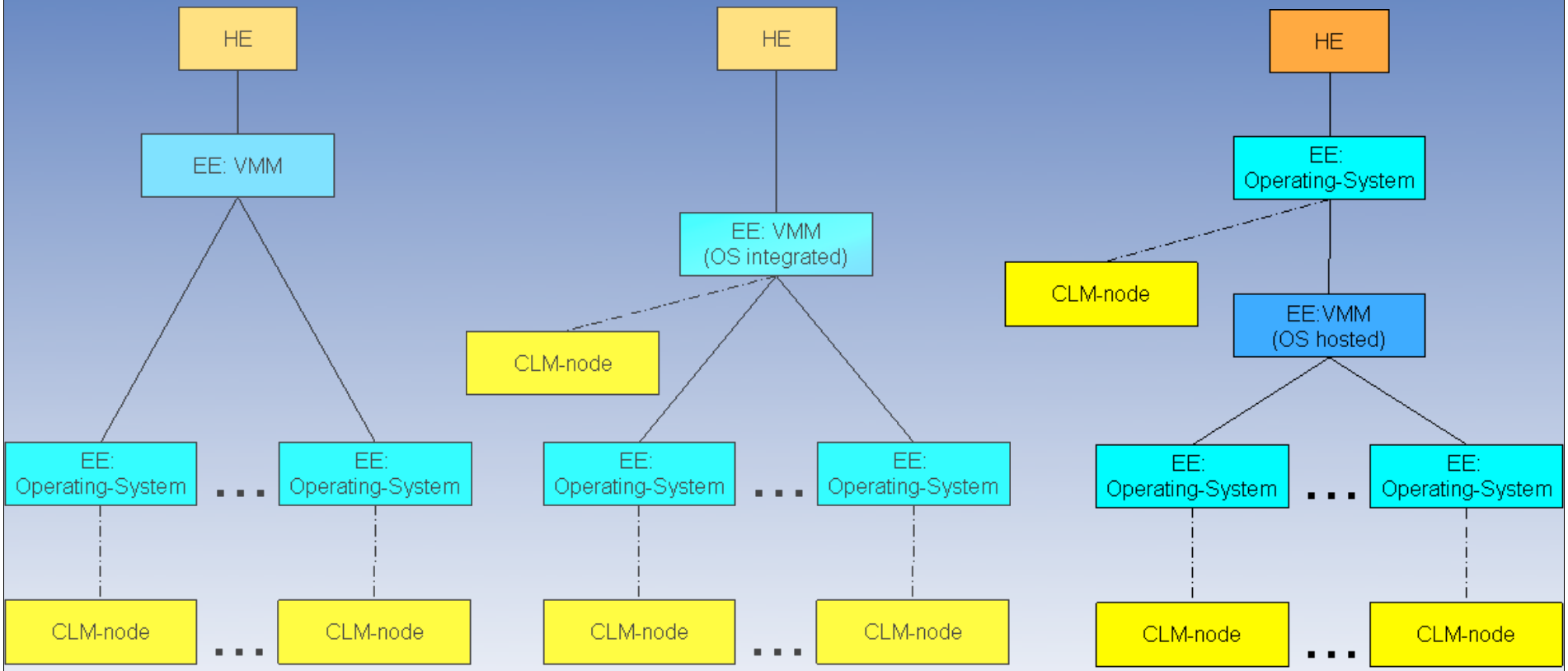

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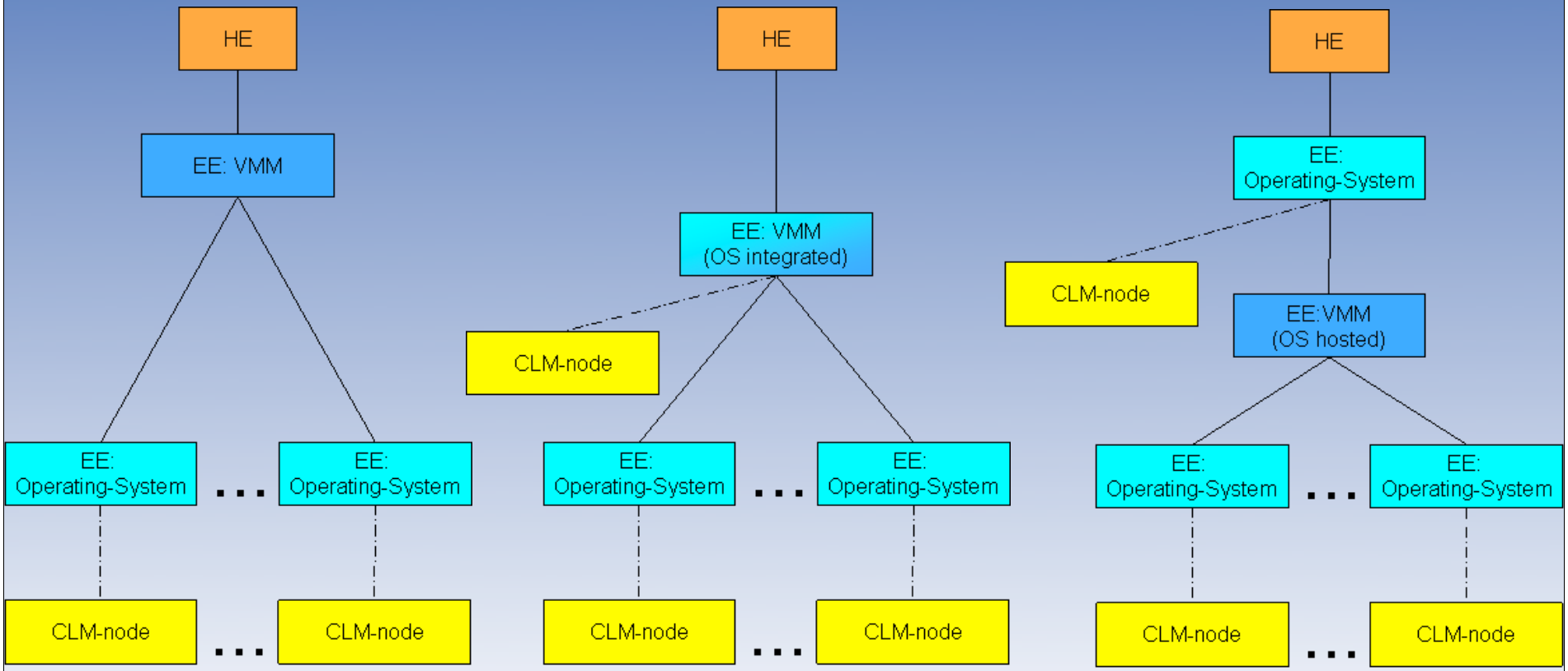
Modeling different Virtualization Architectures



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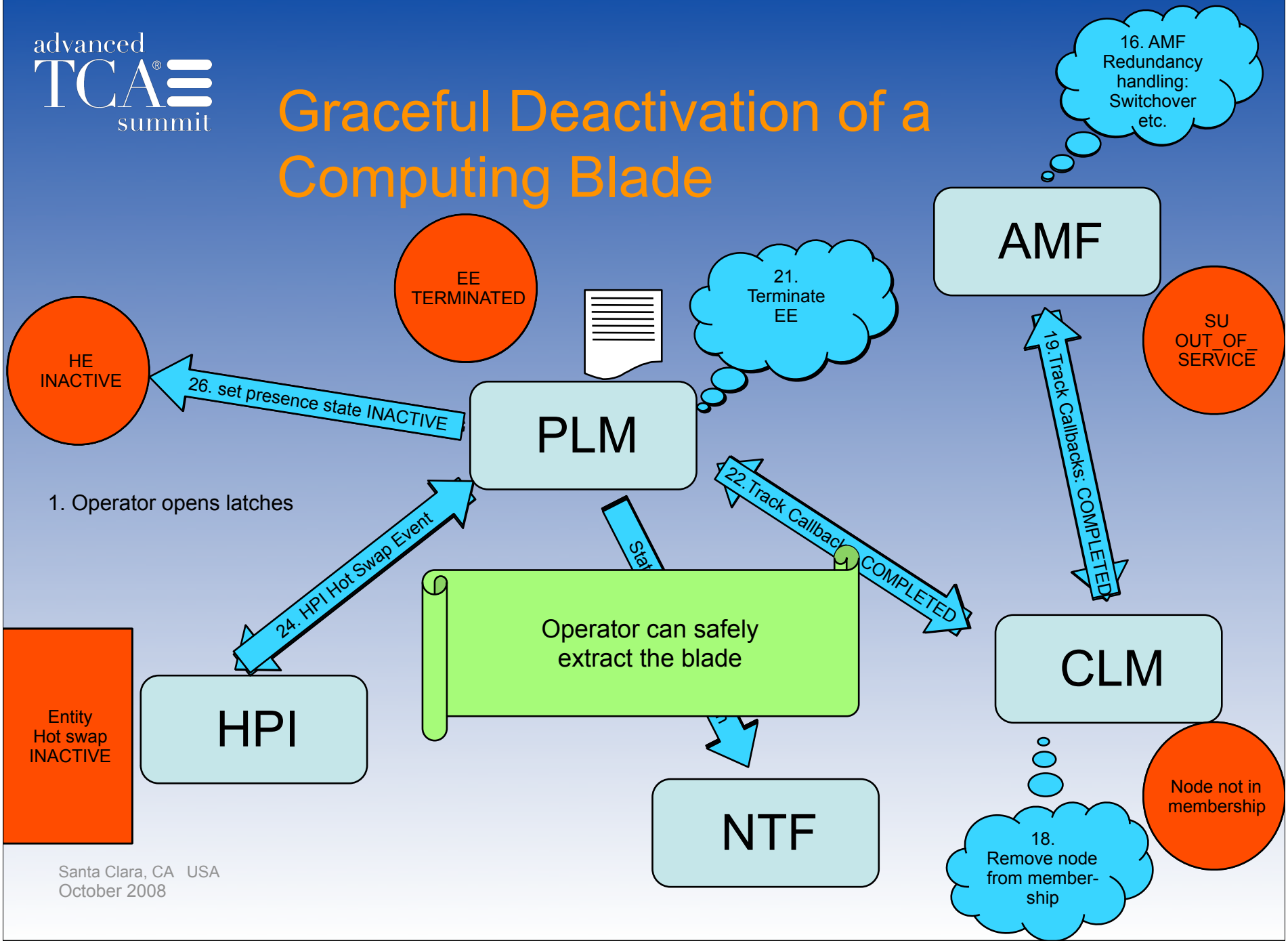
State Management

- PLM maintains the states of these objects
- PLM notifies its users about state changes
  - PLM track interface
    - Any process can subscribe
    - Components with HW dependency will subscribe on that particular entity
    - CLM Service will subscribe on the EEs running cluster nodes.
- Example: Board extraction in ATCA

Graceful Deactivation of a Computing Blade



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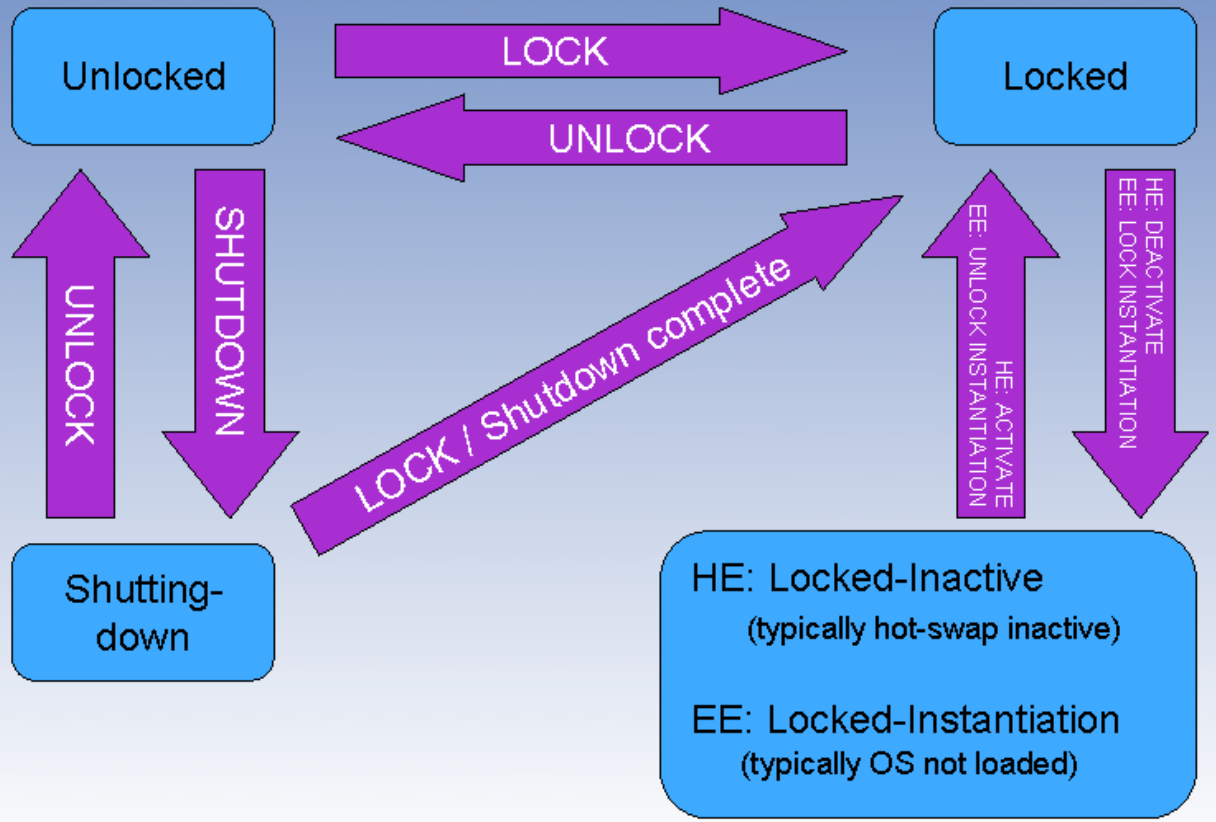
Health Monitoring and Fault Correlation

- PLM performs HW health monitoring using HPI
  - States of PR objects are maintained
- PLM performs EE health monitoring (implementation specific)

- PLM provides correlation identifiers for all events on those objects
- Redundancy switch-over of AMF can be correlated on events in hardware, OS and virtualization layer

PLM Administrative operations

- PLM provides administrative states and OAM commands on its objects to support maintenance procedures:



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Usage of Administrative Operations

- Control hardware states from remote location
- Graceful Lock/Unlock on OS / virtual machines

- These commands can also be used during upgrade campaigns
- SA Forum Software Management Framework soon will be able to support upgrade also for PLM entities

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Achieve 5 Nines in Reality

- 5 Nines is about 5 minutes average downtime
- During repair time there is no redundancy (1:1 or 2N model) or only reduced redundancy (N+M or N-way model)
- AIS provides complex redundancy schemes, but when redundancy is not available that will not help
- Reduce time to repair
  - ➔ restore redundancy as fast as you can
  - ➔ **be able to correlate notifications of services with root causes like hardware events**

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Summary

- PLM Service closes the gap between discovered hardware and configured system model
- PLM Service completes the SA Forum information model with object classes representing hardware, virtualization and operating system layer
- PLM provides the basis for fault correlation, thus supporting fast fault analysis and improve availability

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Questions?