# Fault Management in NFV E2E Architecture Framework

- The decoupling of software from hardware by means of virtualization changes the way how fault was managed in software-hardware tightly coupled node deployments

  - Management of hardware and software becomes independent, ideally
    - VNFM detects VNF application level faults, VIM detects NFV Infrastructure level faults.
  - Fault correlation would be performed at multiple management functional blocks
    - Fault is delegated to a higher layer management entity only when it is needed to get involved
  - Post fault notification, and fault recovery action based on notification are two different issues
    - E.g., VNFM/VIM, upon detection of a fault, already takes recovery actions
    - OSS could be informed about the incident later for completeness (case by case issue)
      - or, VNFM/VIM can delegate to higher layer entities e.g. NFVO, OSS if it cannot take care of a fault
        » These also depend on Operators operational policy

This is an open issue and being discussed in different communities. However, in OPNFV Doctor project, fault detection and notification at/from VIM is the scope. This is an indispensable feature for Operators and whatever may be the fault correlation architecture is, a management functional block (e.g. VIM) needs to detect faults in the entity it is managing (e.g. NFVI) and inform impacted entities (e.g. VNFM/NFVO)

OPNFV

DOCTOR using ETSI NFV E2E Arch. Framework

Source: ETSI NFV GS NFV-0010 V0.1.6 (2013-08)
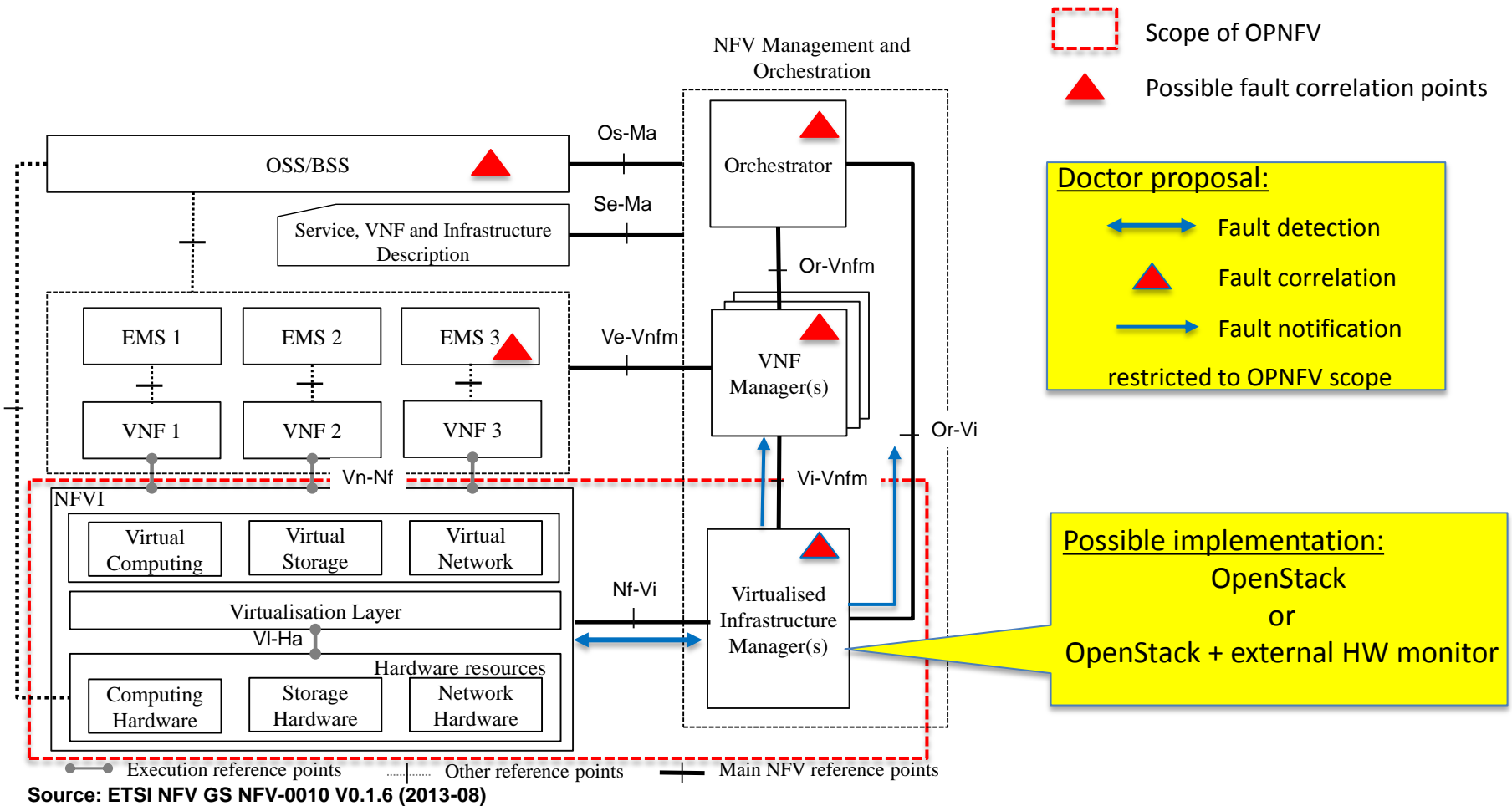
Respecting OPNFV scope, only NFVI fault detection and VIM northbound I/Fs are the focus
The complete Fault Management Arch. and mechanism for NFV E2E Arch. is outside scope

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ETSI NFV Fault Management Flows

OPNFV scope

1 VIM reports FM notifications for virtual resources to NFVO

2 VIM reports FM notifications for virtual resources to impacted VNFM.

3 VNFM relays FM notifications to EM.

4 VNF reports FM notifications to impacted VNFM

5 MANO GS shows EM as user of the FM interfaces although the reference point is outside of NFV scope

6 VNFM relays VNF FM notifications to NFVO

7 The NFV Orchestrator provides Network Service FM notifications to OSS/BSS based on FM notifications from both VNF and VIM.

OSS/BSS

NFV Orchestrator

NW Service FM

EM

Virt Res FM

VNF Manager

VNF

VNF FM

NFVI

Virtual resources

Virtual Computing | Virtual Storage | Virtual Network

Virtualization layer

Hardware resources

Computing HW | Storage HW | Network

Virtualized Infrastructure Manager

VNF FM

Virt Res FM

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OPNFV