Common NFVI Telco Taskforce

Antwerp Face-To-Face Sessions

Beyond Botrange

Reference Model Chapters:
   > Ch 3: Modeling – Bernard Tsai (DT)
   > Ch 4: Abstraction – Mark Shostak (AT&T)
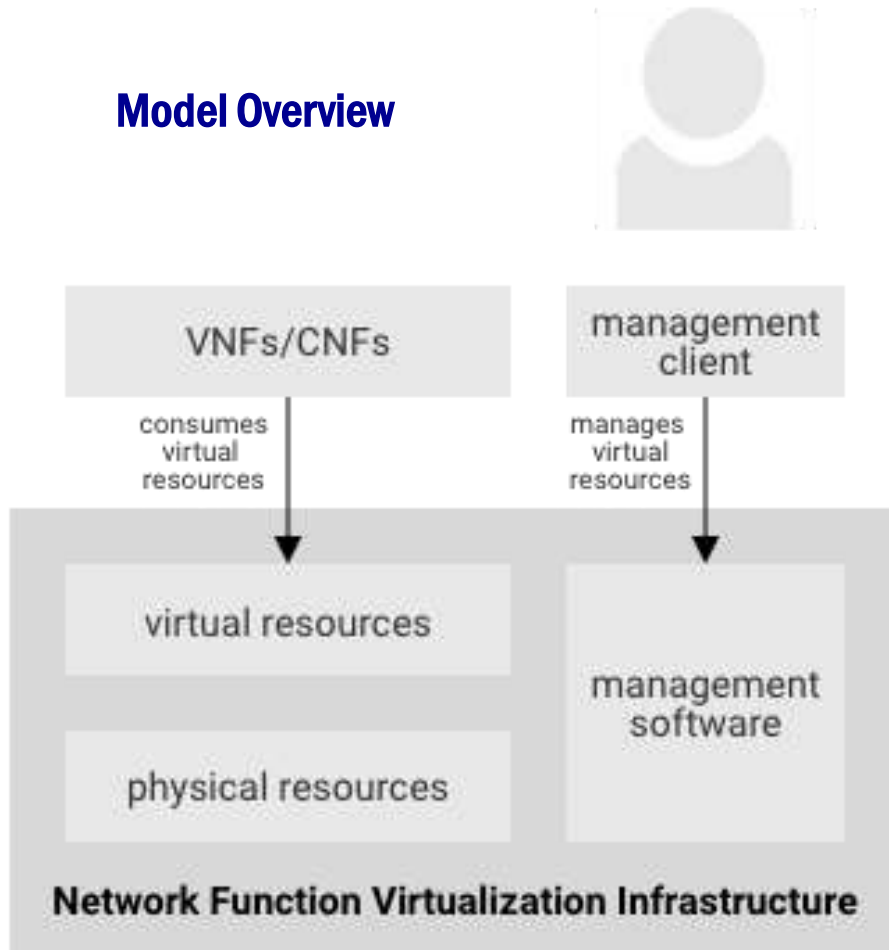   > Ch 5: Infra Profiles & Requirements – Karine Sevilla (Orange)

September 26, 2019

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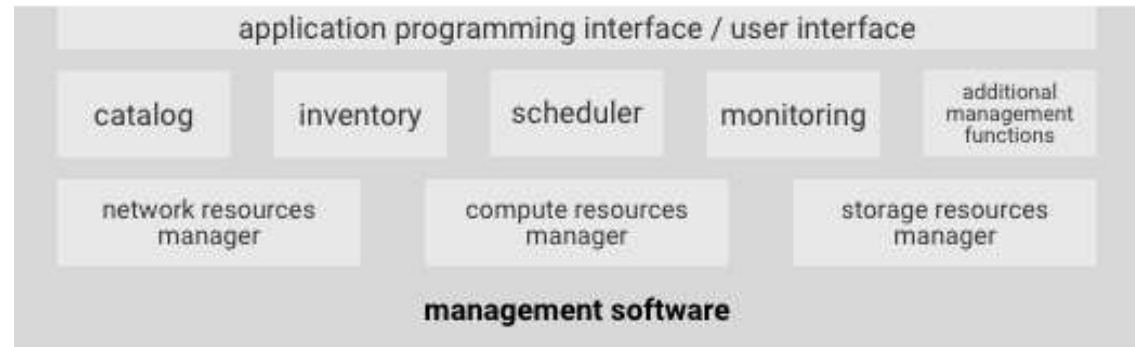# Reference Model Chapter 3: Modelling

Reference Model - Chapter 3 Modelling LO Infrastructure Abstraction
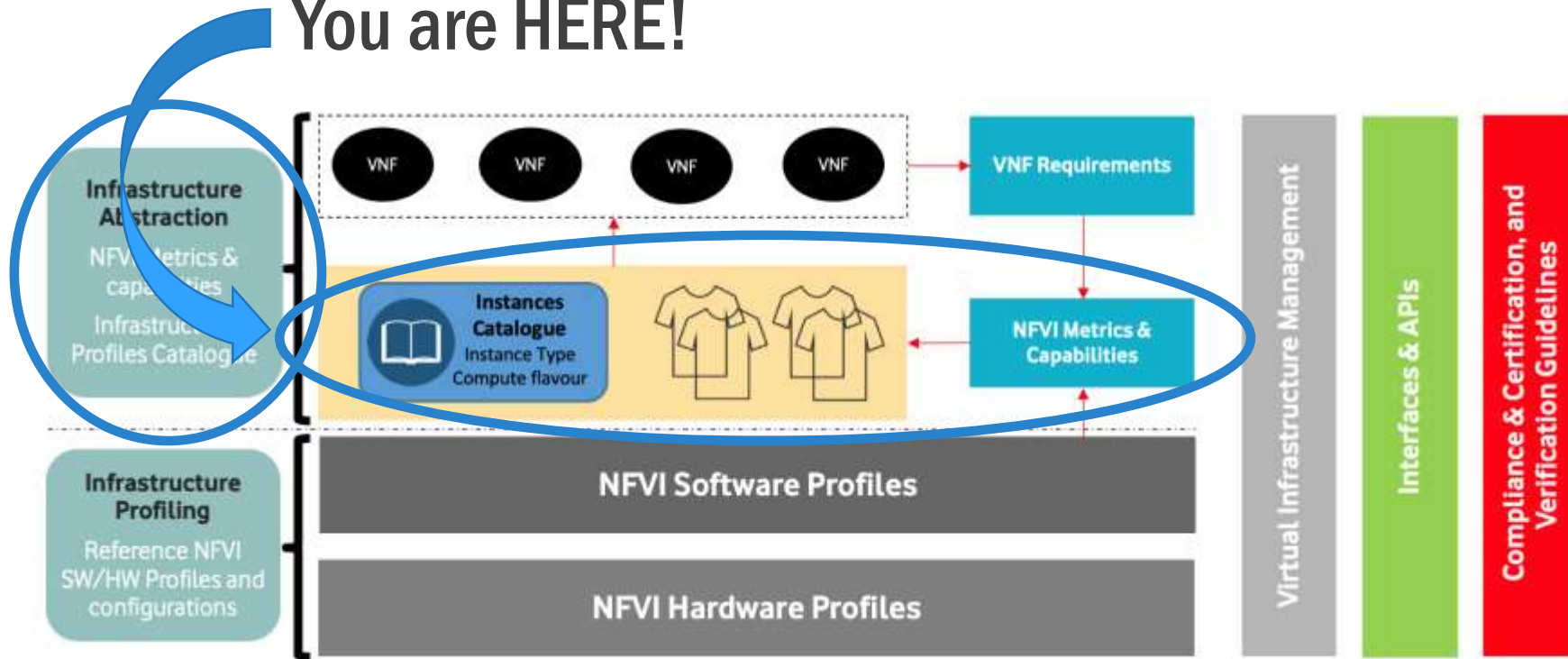
Model Overview

Changes:

- **NFVI decomposition**
  virtual resources, physical resources and management software
- **Virtual Resources: Tenant**
  alignment with definition in chapter 1
- **Management Software**
  identification of main software modules

Reference Model Chapter 4: Infrastructure Abstraction

Infrastructure Abstraction

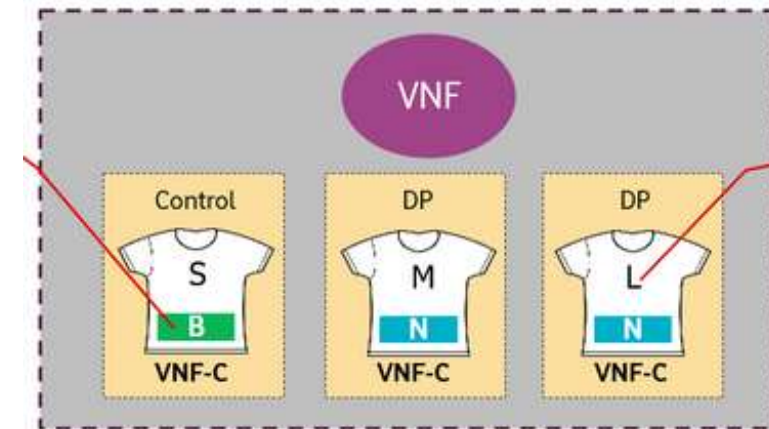# Major Updates Since Paris
(assumes general chapter familiarity)

✓ Abstraction details consolidated in Chapter 4 from Chapter 3

✓ The new Chapter 4 covers

➤ Infrastructure Resources, Capabilities and Metrics

➤ Catalogue, including:

- Flavours (aka T-Shirt sizes)

- Instance Types

- 4.1 Capabilities and Metrics.
  - 4.1.1 Exposed vs Internal.
  - 4.1.2 Exposed Infrastructure capabilities.
  - 4.1.3 Exposed Infrastructure metrics.
  - 4.1.4 Internal Infrastructure capabilities.
  - 4.1.5 Internal Infrastructure metrics.
  - 4.1.6 VIM capabilities.
  - 4.1.7 VIM metrics.

Content from Ch. 3

- 4.2 Catalogue.
  - 4.2.1 Compute Flavours.
  - 4.2.2 Virtual Network Interface Specifications.
  - 4.2.3 Storage Extensions.
  - 4.2.4 Instance types.
  - 4.2.5 Instance capabilities mapping.
  - 4.2.6 Instance metrics mapping.
  - 4.2.7 One stop shop.

Original Ch. 4 Content

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Major Updates Since Paris
(assumes general chapter familiarity)

✓ Enhanced cache management

e.nfvi.per.cap.007	Enhanced Cache Management*	enum	L=Lean; E=Equal; X=eXpanded

Table 4-2: Exposed performance optimisation capabilities of NFVI.

e.nfvi.per.cap.007 (Enhanced Cache Management)	E	E	X (if offered)

✓ Now with more VIM!

Ref	VIM capability	Unit	Definition/Notes
e.vim.res.cap.001	Virtual Compute allocation	Yes/No	Capability to allocate virtual compute resources to VNFC
e.vim.res.cap.002	Virtual Storage allocation	Yes/No	Capability to allocate virtual storage resources to VNFC
e.vim.res.cap.003	Virtual Networking resources allocation	Yes/No	Capability to allocate virtual networking resources to VNFC
e.vim.res.cap.004	Multi-tenant isolation	Yes/No	Capability to isolate resources between tenants
e.vim.res.cap.005	Images management	Yes/No	Capability to manage VNFC software images

Table 4-12: VIM capabilities related to resources allocation .

Ref	VIM capability	Unit
e.vim.mon.cap.001	Virtual resources inventory per tenant	Yes/No
e.vim.mon.cap.002	Resources Monitoring	Yes/No
e.vim.mon.cap.003	Virtual resources Performance	Yes/No
e.vim.mon.cap.004	Virtual resources Fault information	Yes/No

Table 4-13: VIM capabilities relate

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Major Updates Since Paris
(assumes general chapter familiarity)

✓ Refined vNIC Extension

Virtual network interface option	Description (Bandwidth in Gbps)
n1, n10, n1T, n1Q, n1P, n1H	1x 1, 2x 1, 3x 1, 4x 1, 5x 1, 6x 1 Gbps
n10, n10D, n10T, n10Q, n10P, n10H	1x 10, 2x 10, 3x 10, 4x 10, 5x 10, 6x 10 Gbps
n25, n25D, n25T, n25Q, n25P, n25H	1x 25, 2x 25, 3x 25, 4x 25, 5 25 6 25 Gbps
n50, n50D, n50T, n50Q, n50P, n50H	1x 50, 2x 50, 36x 50, 4x 50,
n100, n100D, n100T, n100Q, n100P, n100H	1x 100, 2x 100, 3x 100, 4x

Original Table 4-15

Virtual Network Interface Option	Interface Bandwidth
n1, n2, n3, n4, n5, n6	1, 2, 3, 4, 5, 6 Gbps
n10, n20, n30, n40, n50, n60	10, 20, 30, 40, 50, 60 Gbps
n25, n50, n75, n100, n125, n150	25, 50, 75, 100, 125, 150 Gbps
n50, n100, n150, n200, n250, n300	50, 100, 150, 200, 250, 300 Gbps
n100, n200, n300, n400, n500, n600	100, 200, 300, 400, 500, 600 Gbps

Revised Table 4-15

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Major Updates Since Paris
(assumes general chapter familiarity)

✓ Consolidated Capabilities mapping - Mappings consolidated to single table

✓ Labels added to Capabilities mapping for readability

Ref	B Instance	N Instance	C Instance	Notes
e.nfvi.res.cap.001 (#vCPU cores)	Per selected \<Flavour>	Per selected \<Flavour>	Per selected \<Flavour>	Exposed resource capabilities as per Table 4-1
e.nfvi.res.cap.002 (Amount of RAM (MB))	Per selected \<Flavour>	Per selected \<Flavour>	Per selected \<Flavour>	
e.nfvi.res.cap.003 (Total instance (ephemeral) storage (GB))	Per selected \<Flavour>	Per selected \<Flavour>	Per selected \<Flavour>	
e.nfvi.res.cap.004 (# vNICs)	Per selected	Per selected	Per selected	

Major Updates Since Paris
(assumes general chapter familiarity)

✓ Updated "1-Stop Shop" Graphic

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To-Do List

- ✓ Major changes to accommodate containers (identified)
- ✓ Complete refinements to vNIC extension
- ✓ Clear definitions for Resources, Capabilities, Metrics, etc.
- ✓ Refine Metrics (instrument-based metrics -> Test ch., language, etc.
- ✓ Resolve performance-related issue
- ✓ Decouple sizes from performance profiles in Storage Extensions matrix

Challenges

- ▪ Changes to accommodate containers (to be identified)
- ▪ Impress your friends ☺ Contribute to CNTT RM container development!!!

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Beyond Botrange…

Come join the Wednesday Chapter 2/4/5 weekly meeting!

- ✓ Every Wednesday at 13:00 UTC

- ✓ Find current bridge info here:

  https://github.com/cntt-n/CNTT/wiki/Meetings

Reference Model Chapter 5: Feature Set and Requirements from Infrastructure

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Reference Model - Chapter 5 Feature set and Requirements from Infrastructure

Chapter 5 focuses on NFVI SW and HW profiles

➢ Requirements from nodes hosting workloads

➢ Set of features exposed to VNFs

➢ SW and HW profiles features and configurations characterizing the 3 Instances types:

 ❑ Basic

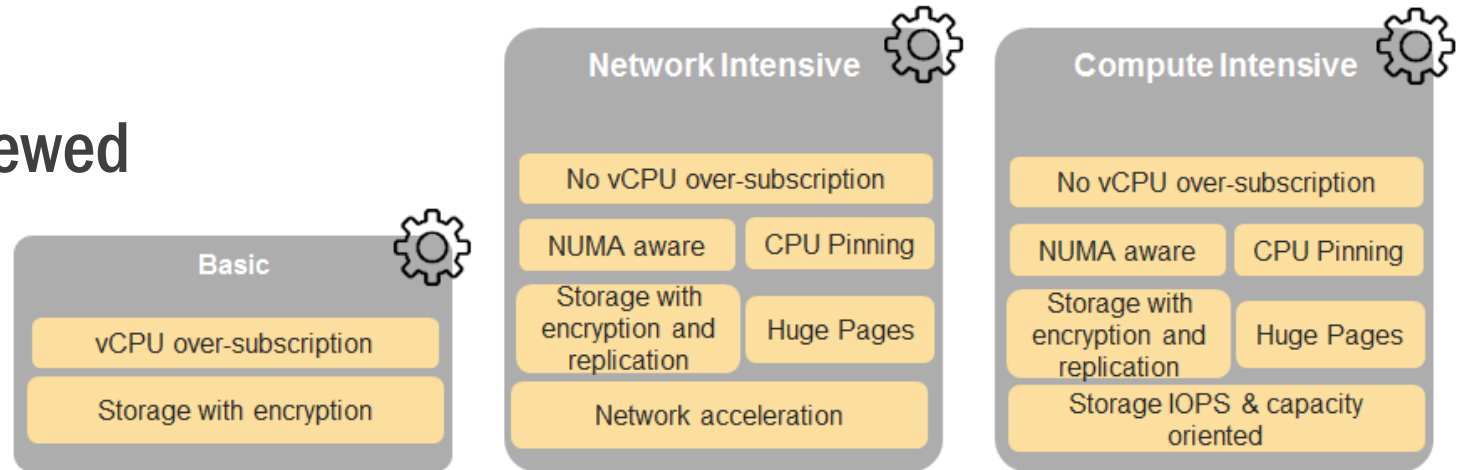 ❑ Network Intensive

 ❑ Compute Intensive

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Reference Model - Chapter 5 Feature set and Requirements from Infrastructure

RM 2 status:

NFVI SW and HW profiles reviewed

NFVI SW profiles

Basic

- vCPU over-subscription
- Storage with encryption

Network Intensive

- No vCPU over-subscription
- NUMA aware
- CPU Pinning
- Storage with encryption and replication
- Huge Pages
- Network acceleration

Compute Intensive

- No vCPU over-subscription
- NUMA aware
- CPU Pinning
- Storage with encryption and replication
- Huge Pages
- Storage IOPS & capacity oriented

NFVI HW profiles

Basic

RAM	HDD/SSD
SMT/HT	#NIC
#CPU	#Cores

Network Intensive

HW Offloads (e.g.SmartNic)	HDD/SSD
RAM	NUMA
SMT/HT	#NIC
#CPU	#Cores

Compute Intensive

HW Offloads (e.g.GPU)	HDD/SSD
RAM	NUMA
SMT/HT	#NIC
#CPU	#Cores

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Reference Model - Chapter 5
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Keep the profiles agnostic to technologies choices

Topics to be developed within the next release

- ➢ RM 2.0 NFVI profiles are oriented compute node, lack of content and description for storage
- ➢ Improve the hardware profiles specifications (e.g. CPU)
- ➢ Develop a 4th instance type "Storage intensive": NFVI profile hosting VNFs with specific storage needs (high storage IOPS and high storage volume)

Missing Features?

Q&A

Thank You!