

# 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

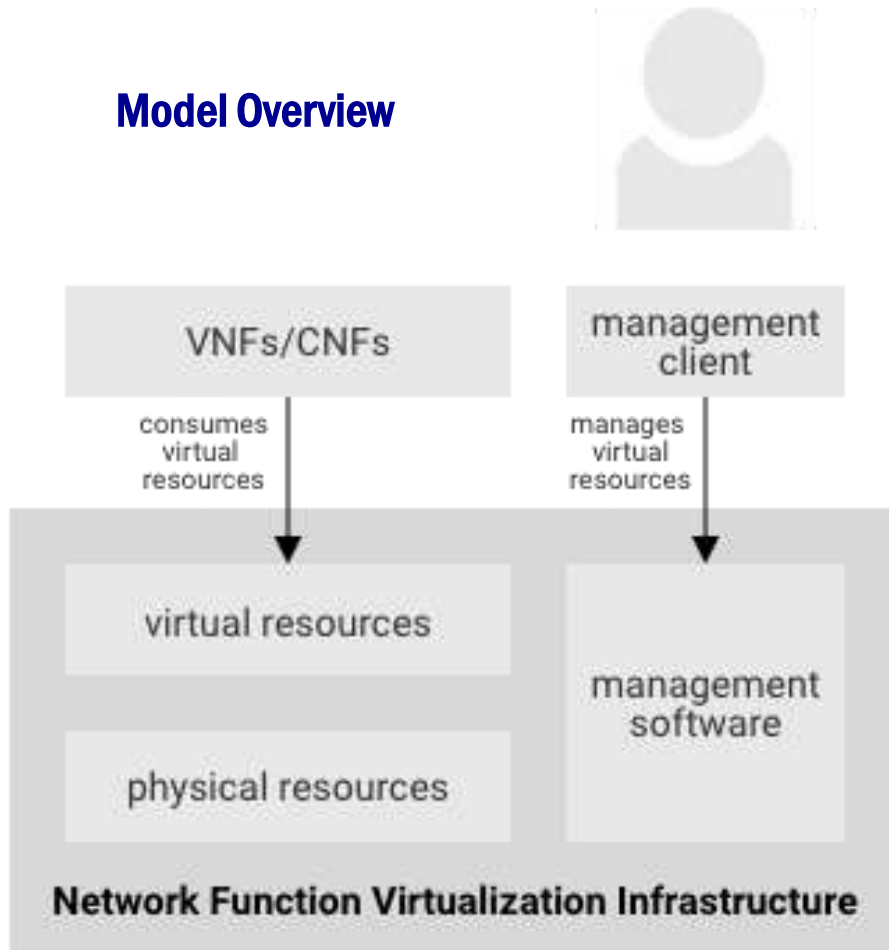
 THE **LINUX** FOUNDATION



# Reference Model Chapter 3: Modelling

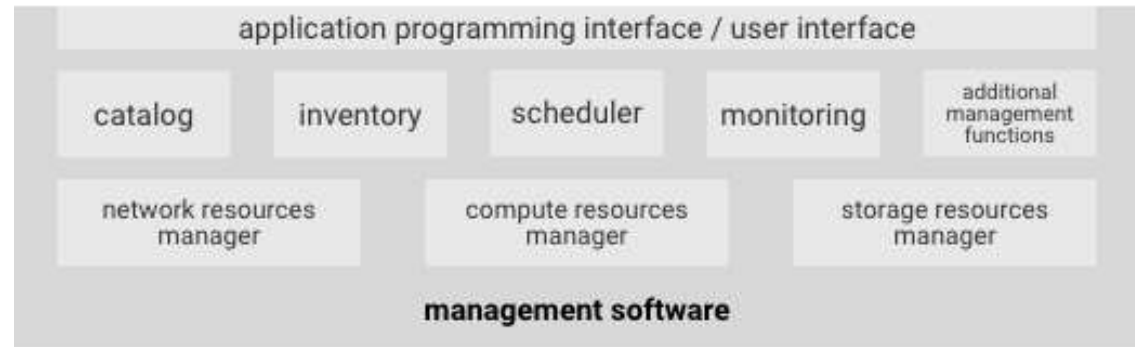
# Reference Model - Chapter 3 Modelling LO Infrastructure Abstraction

## Model Overview



## Changes:

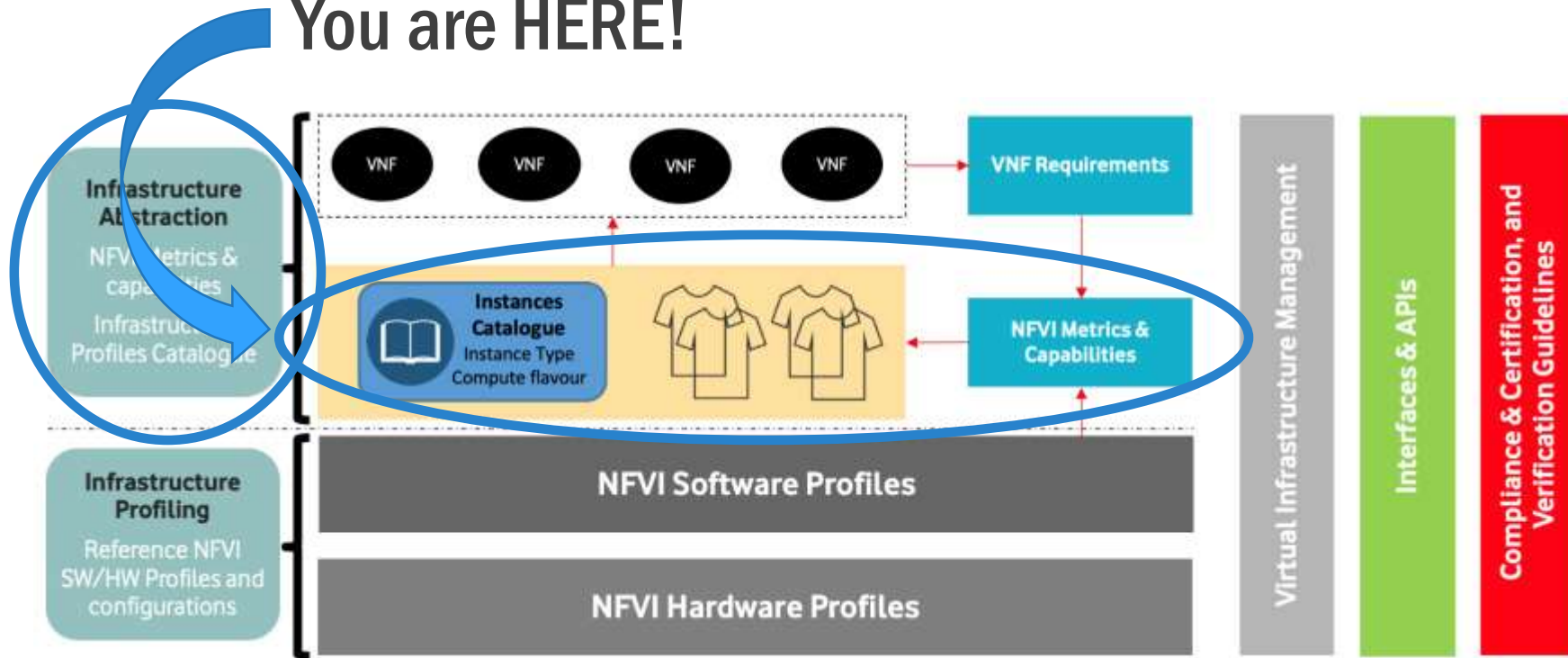
- **NFVI decomposition**  
virtual resources, physical resources and management software
- **Virtual Resources: Tenant**  
alignment with definition in chapter 1
- **Management Software**  
identification of main software modules



# Reference Model Chapter 4: Infrastructure Abstraction

# Infrastructure Abstraction

You are **HERE!**



# Major Updates Since Paris

(assumes general chapter familiarity)

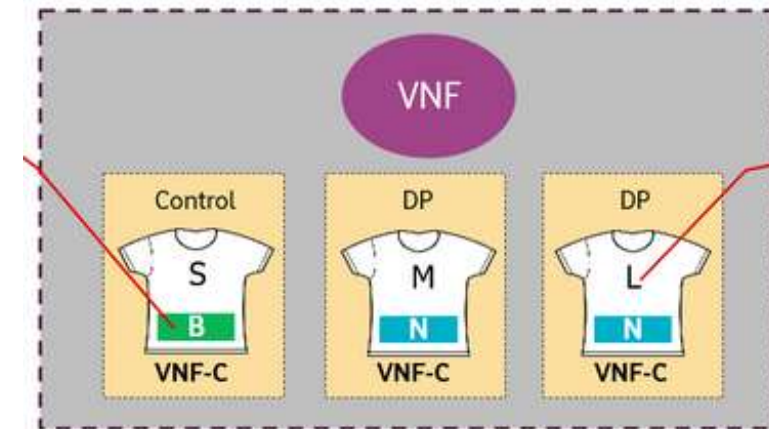
- ✓ Abstraction details consolidated in Chapter 4 from Chapter 3
- ✓ The new Chapter 4 covers
  - Infrastructure Resources, Capabilities and Metrics
  - Catalogue, including:
    - Flavours (aka T-Shirt sizes)
    - Instance Types

- 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



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

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



# Major Updates Since Paris

(assumes general chapter familiarity)

- ✓ Refined vNIC Extension
- ✓ Consolidated Capabilities mapping
- ✓ Labels added to Capabilities mapping
- ✓ Updated “1-Stop Shop” Graphic

Virtual network interface option	Description (Bandwidth)
n1, n10, n1T, n1Q, n1P, n1H	1x 1, 2x 1, 3x 1, 4x 1, 5x 1, 6x 1
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, 5x 25, 6x 25 Gbps
n50, n50D, n50T, n50Q, n50P, n50H	1x 50, 2x 50, 3x 50, 4x 50, 5x 50, 6x 50 Gbps
n100, n100D, n100T, n100Q, n100P, n100H	1x 100, 2x 100, 3x 100, 4x 100, 5x 100, 6x 100 Gbps

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



# Major Updates Since Paris

(assumes general chapter familiarity)

- ✓ Consolidated Capabilities mapping - Mappings consolidated to single table
- ✓ Labels added to Capabilities mapping for readability

## 4.2.5 Instance capabilities mapping.

✓ Updated

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 <a href="#">Table 4-1</a>
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

**B Instance Basic**  
Can be instantiated in any Data Centre.

(I) Interfaces Options

1Gbps	2Gbps	5Gbps	...
10Gbps	20Gbps	50Gbps	...

B <I opt> . <Flavour> . <S ext>

**N Instance Network intensive**  
Aimed for regional data centres, Access, & POP.

(I) Interfaces Options

50Gbps	100Gbps	150Gbps	...
100Gbps	200Gbps	300Gbps	...

N <I opt> . <Flavour> . <S ext> . <A ext>

**C Instance Compute intensive**  
Aimed for local data centres, and on Edge.

(I) Interfaces Options

10Gbps	20Gbps	50Gbps	...
25Gbps	50Gbps	75Gbps	...

C <I opt> . <Flavour> . <S ext> . <A ext>

**Compute Flavours**

Flavour	vCPU	RAM	Disk	Network
.tiny	1	512MB	1 GB	1 Gbps
.small	1	2GB	20 GB	1 Gbps
.medium	2	4GB	40 GB	1 Gbps
.large	4	8GB	80 GB	1 Gbps
.2xlarge	8	16GB	160 GB	1 Gbps
.4xlarge	16	32GB	320 GB	1 Gbps

**S extensions (Ext. Storage)**

- .100GB
- .200GB
- .300GB

**S Performance Profiles**

- .bronze
- .silver
- .gold

**Network Acceleration (A extension)**

- .la-crypto crypto look-aside
- .il-ipsec ipsec in-line

**Compute Acceleration (A extension)**

- .la-trans transcoding look-aside
- .la-prog Programmable look-aside

# Beyond Botrange...

## 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!!!

# 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

# 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

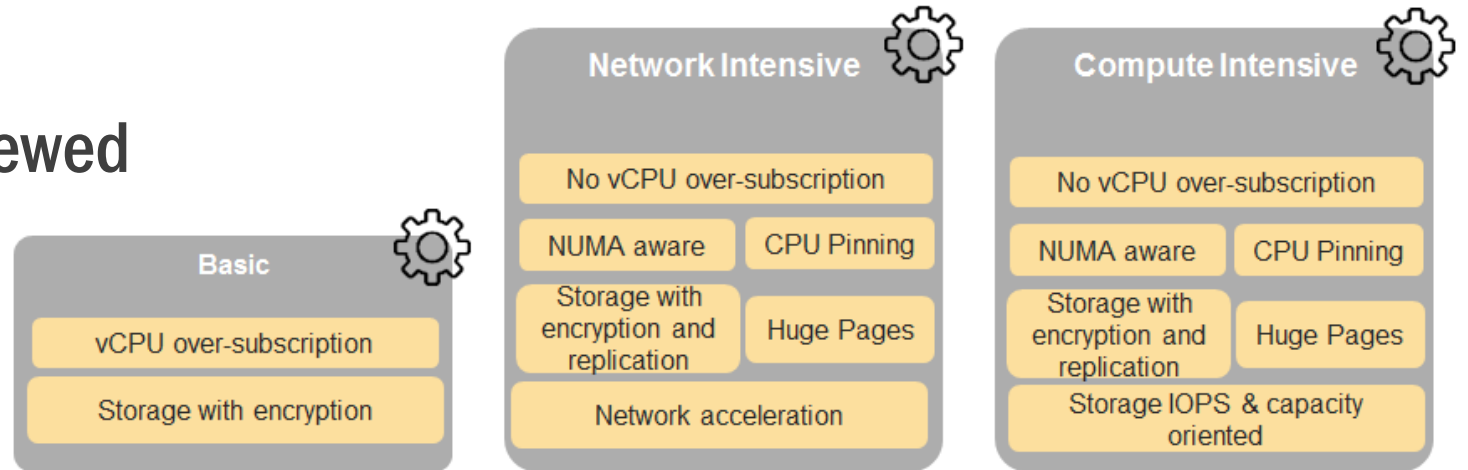
# Reference Model - Chapter 5

## Feature set and Requirements from Infrastructure

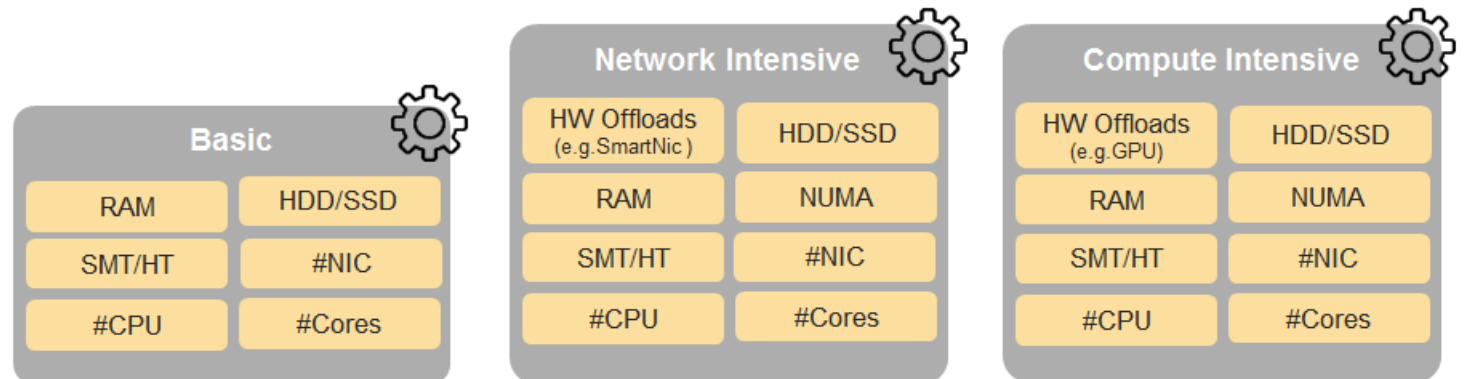
RM 2 status:

NFVI SW and HW profiles reviewed

NFVI SW profiles



NFVI HW profiles





# Reference Model - Chapter 5

## Beyond Botrange

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 4<sup>th</sup> 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!