
Universidad Politécnica de Madrid
POLITÉCNICA
Integration HPC-Big Data-IOT
Roberto Martínez
BDV
BIG DATA VALUE ASSOCIATION
Engineering the future

UNIVERSIDAD POLITÉCNICA DE MADRID

BDV BIG DATA VALUE ASSOCIATION

H2020 Work Programme

Horizon 2020 - Work Programme 2018-2020

….The aim of the activities under this heading is to enable the creation of a world-class High Performance Computing (HPC)/Big Data (BD) ecosystem based on European leadership in HPC, Cloud and Big Data technologies….

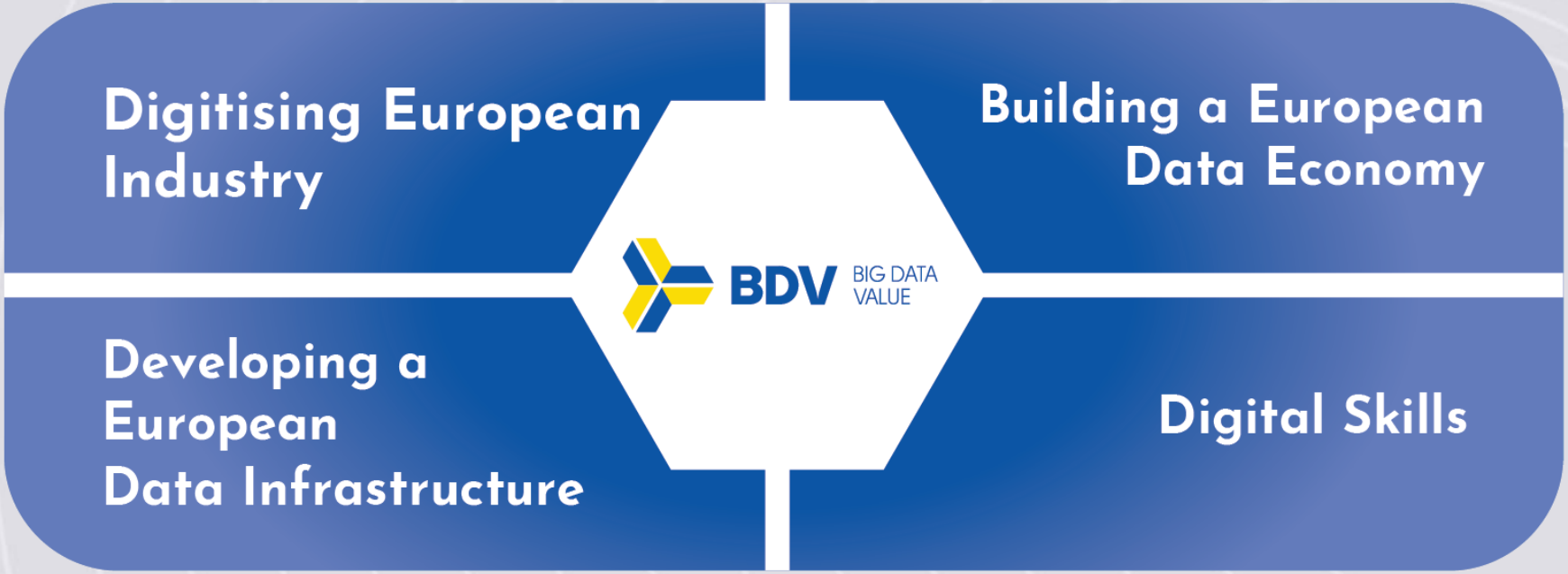
"The Internet of Things and the convergence of HPC, Big Data and Cloud computing technologies"*

"…..resulting in an increased prevalence of data value chains and related technologies (HPC/BD/Cloud/IoT)." *

"…..a coordinated action with all related areas (e.g. analytics, software engineering, HPC, Cloud technologies, IoT) is necessary."*

*** From H2020 ICT 11 and ICT 12 topics***

Contributing to the Digital Single Market Strategy Implementation



Organisations

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ETP 4 HPC EUROPEAN TECHNOLOGY PLATFORM FOR HIGH PERFORMANCE COMPUTING

AIOTI ALLIANCE FOR INTERNET OF THINGS INNOVATION

HiPEAC COMPILATION ARCHITECTURE

BDEC 2018 BIG DATA AND EXTREME-SCALE COMPUTING

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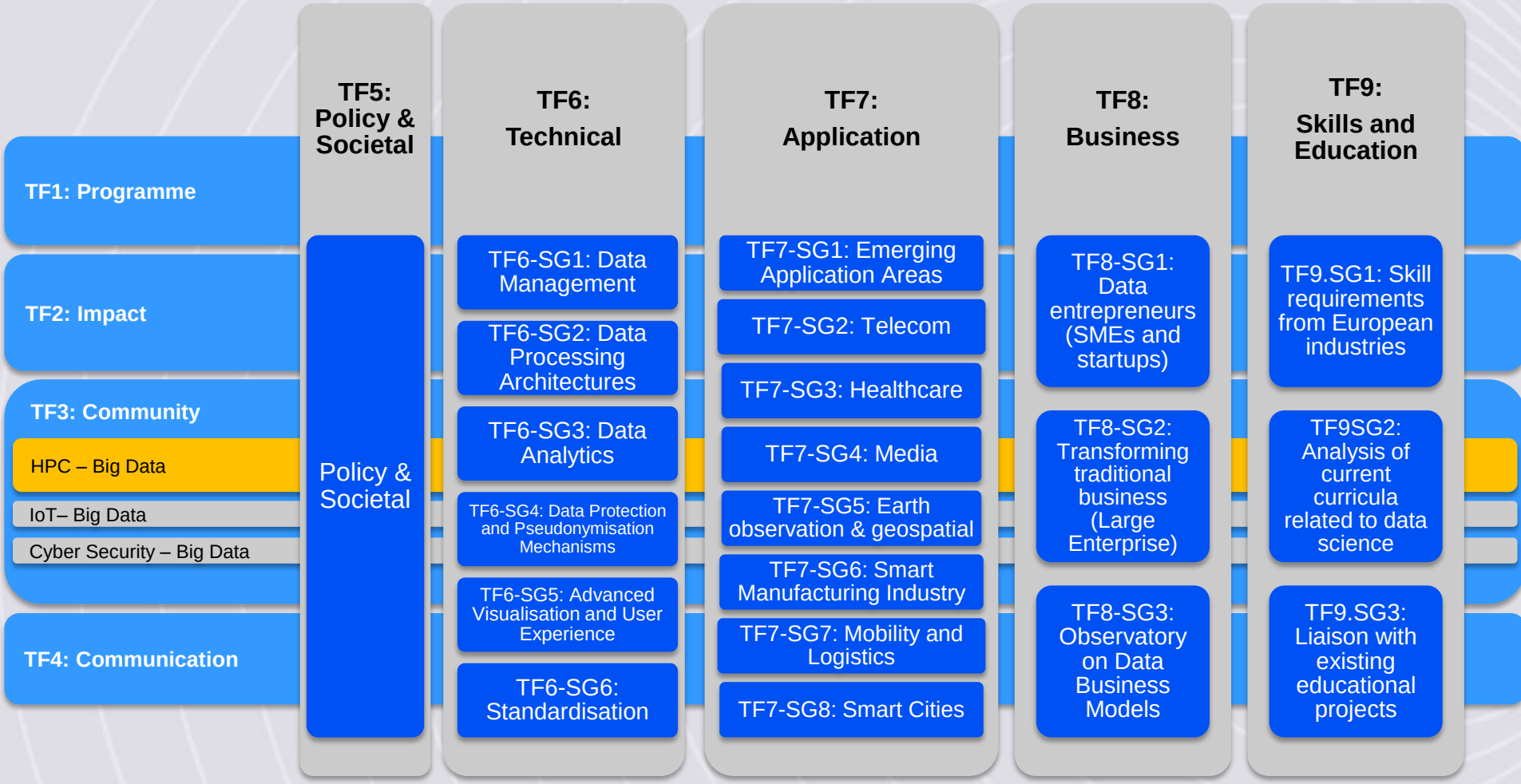
BDVA – Big Data Value Association

http://bdva.eu

BDVA Task Forces



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TF3.SG3: Big Data - HPC collaboration

http://bdva.eu/?q=task-force-3

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HPC-BD Collaboration - Timeline

2016: BDVA participation in ETP4HPC's Steering Board Meeting in **Barcelona** (22-23 September 2016), ~25 attendees

2016: BDVA attended European Extreme Data & Computing Initiative) 1st workshop in **Barcelona** (20-21 September 2016) - ~50 attendees

2016: ETP4HPC participation in BDVA's mini Summit in **Valencia** (29 Nov-1 Dec 2016), ~300 attendees

2017: ETP4HPC SRA Kick-off - meeting 20 March 2017, **Munich** – presentation by BDVA

2017: BDV-PPP – Technical Committee: ETP4HPC representative present, **Brussels**

2017: BDVA attended European HPC Summit in **Barcelona** 15-19 May 2017; presenting and contributing to workshops/round tables

2017: BDVA attended European Extreme Data & Computing Initiative) 2nd workshop in **Bologna**

2017: HPC attend EBDVF & workshops (x2), **Versailles**

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HPC-BD Collaboration, Bologna Workshop, July 2017

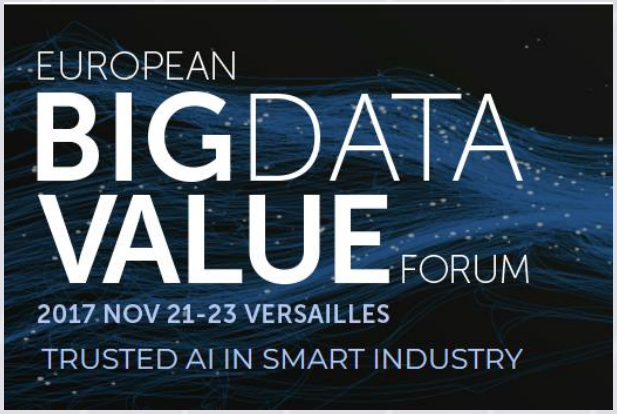
Agenda

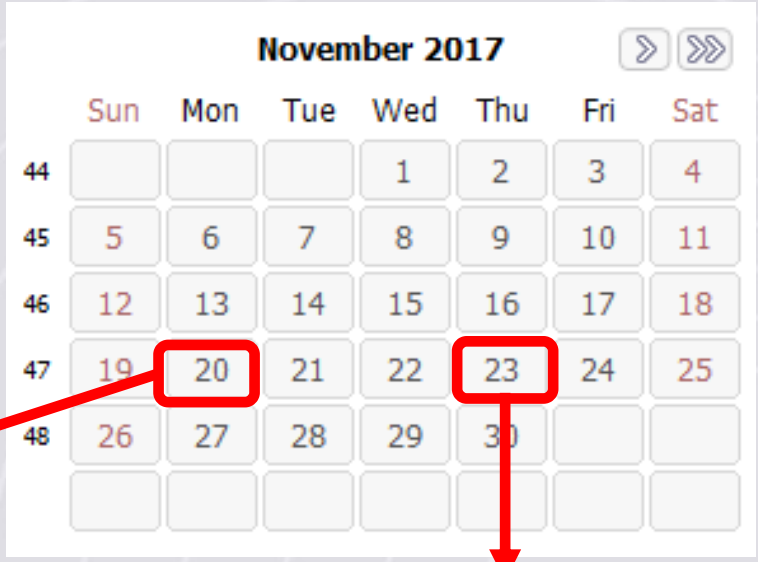
1. *HPC - Big Data - a common glossary*
2. *Cross-Pollination of HPC and BD technologies*
3. *Extreme BD workloads*
4. *Collaboration between HPC CoEs and BD CoEs*
   - *Centres of Excellence for HPC*
   - *Centres of Excellence for Big Data*
5. *User engagement*
6. *Exploring options for possible collaborations*

EXDCI & BDVA group photo

Common understanding of technical challenges for joint future research priorities

HPC-BD Collaboration- EBDVF Workshops x 2, Nov 2017





Monday - 6 hour (pre)workshop

- *Use cases – review in detail*
- *Upcoming calls for potential collaboration e.g. ICT call 11 (17) HPC enabled extreme data analytics*
- *Preparation for Thursday workshop*

Thursday, 90min Workshop

- *Results of Mon*
- *Areas of research commonality: Vision for future by BDVA, HPC, HIPEAC, AIOTI, BDEC*

HPC-BD Collaboration, Versailles Workshop 1, Nov 2017

Agenda

1. *Welcome*
2. *Introduction of AIOTI as organisation technical agenda*
3. *Review of remaining use cases*
4. *ISO use case template walk-through*
5. *HPC template walk-through*
6. *Research projects: critical implementation aspects (political, economical, social and technical challenges)*
7. *Joint look at ICT 11 and 12*
8. *Next events and steps*

Structured description of use cases => common understanding

HPC-BD Collaboration, Versailles Workshop 2, Nov 2017

HPC, BIG DATA AND IoT

Challenges:

- *Extreme Analytics, High Performance Data Analytics, Big Data, HPC, IOT/Edge*

Session organisers:

- *Jim Kenneally (Intel), Michael Malms (IBM)*

Panel session speakers:

- *Thomas Hahn (Siemens AG), Mark Asch (Total), Marc Duranton (CEA), María S. Pérez (UPM)*

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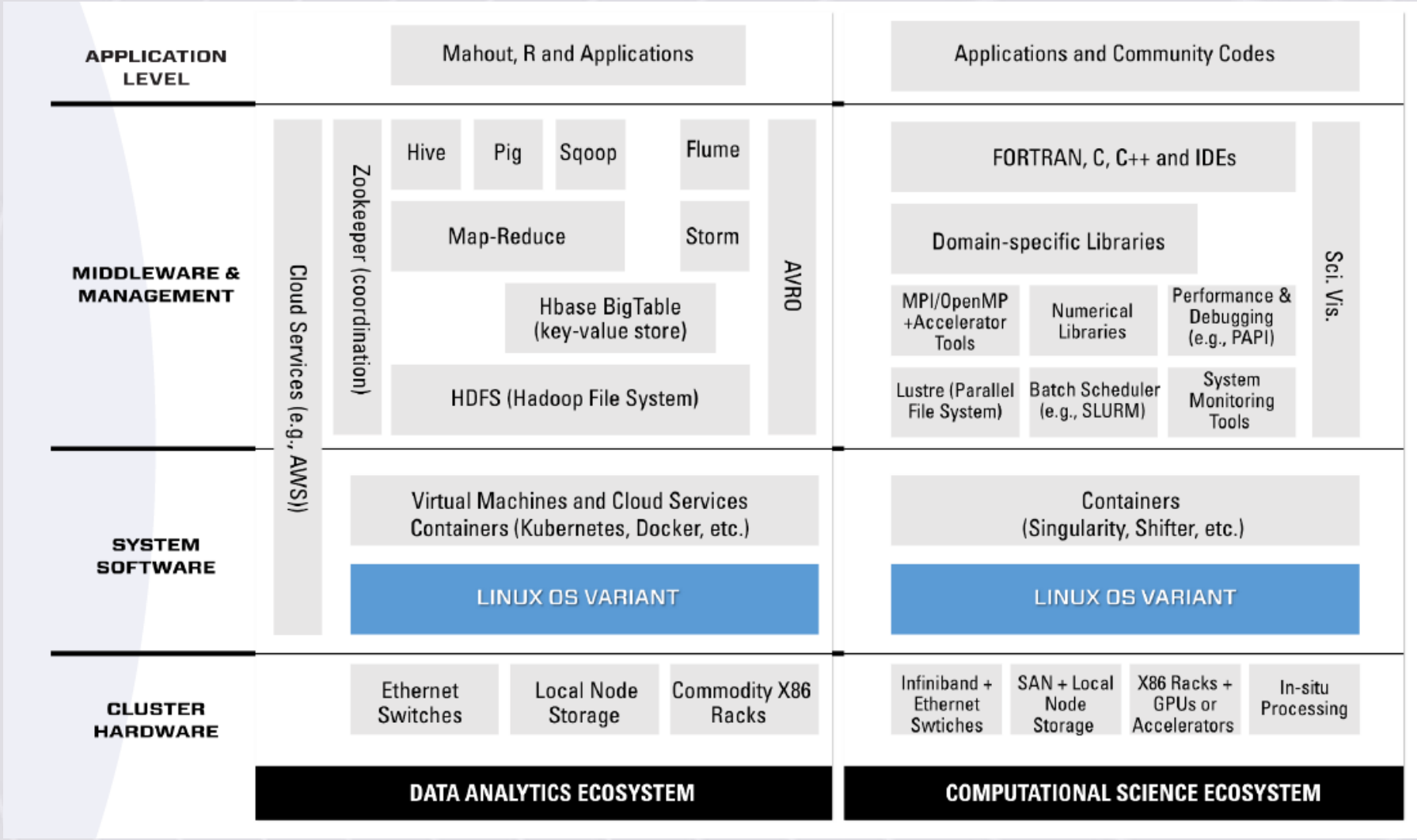
Big Data – HPC subgroup technical roadmap

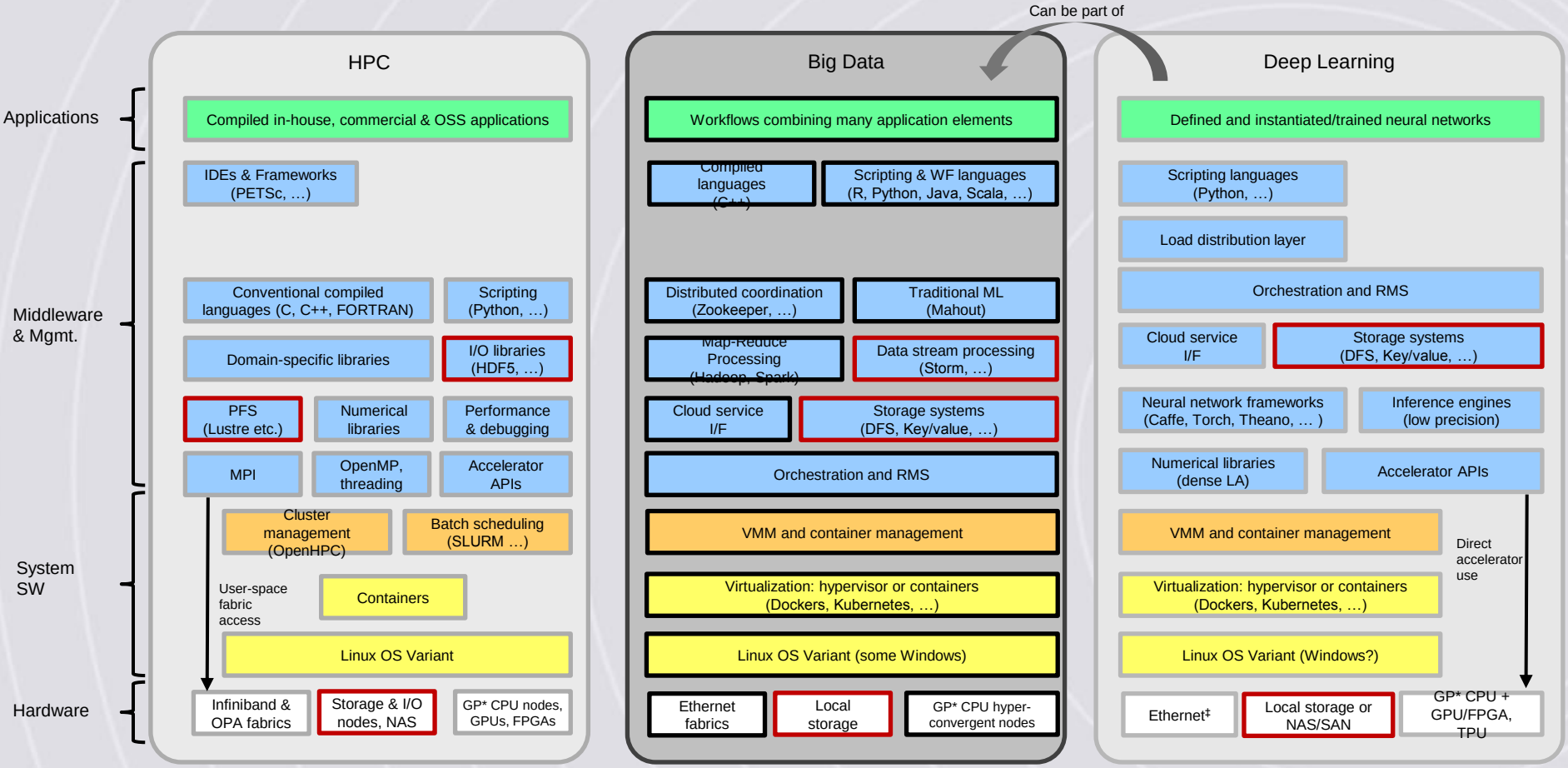
From BDEC report: HPC and Big Data stacks side by side



Reed et al, COMMUNICATIONS OF THE ACM | JULY 2015 | VOL. 58 | NO. 7

ETP4HPCs extension to HPC, Big Data and Deep Learning

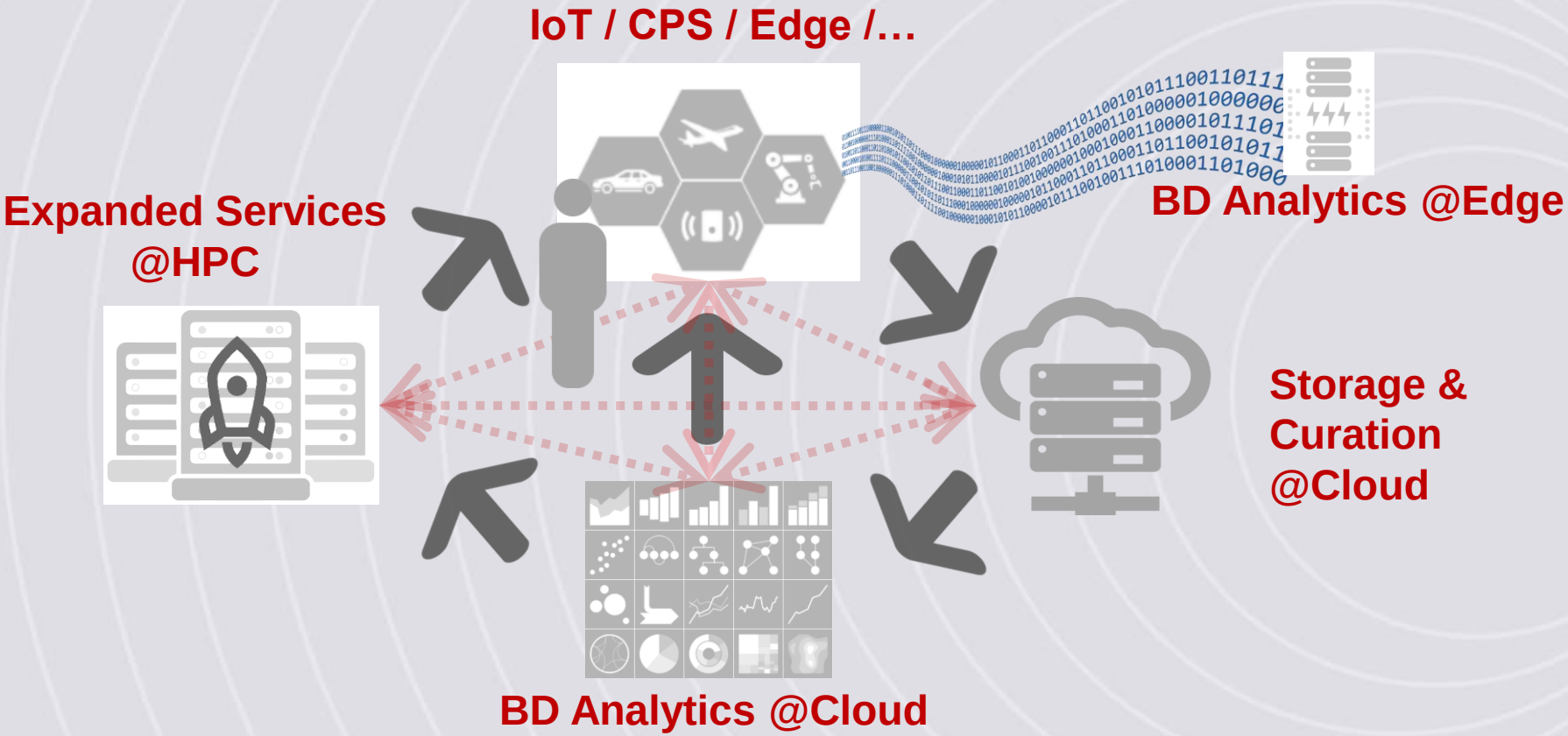
This is the structural foundation of the technical roadmap work ahead



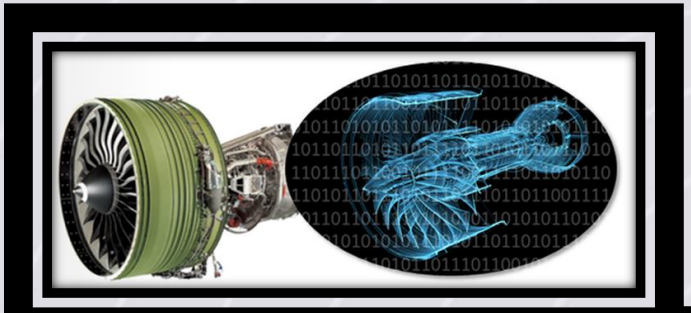
* GP: general purpose Red boxes: data components

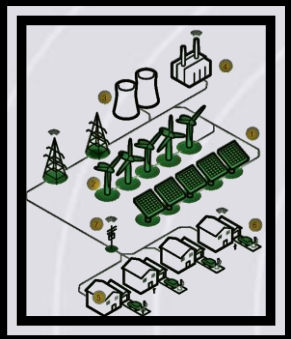
‡ need for faster fabrics for training scale-out

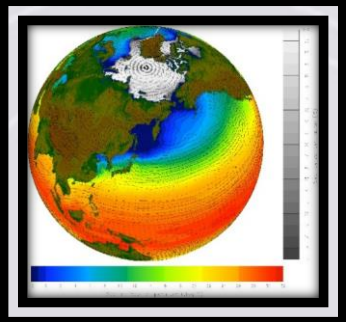
Enabling *new forms* of transforming [*Data*] > [*Information*] > [*Action*] > [*Value*]

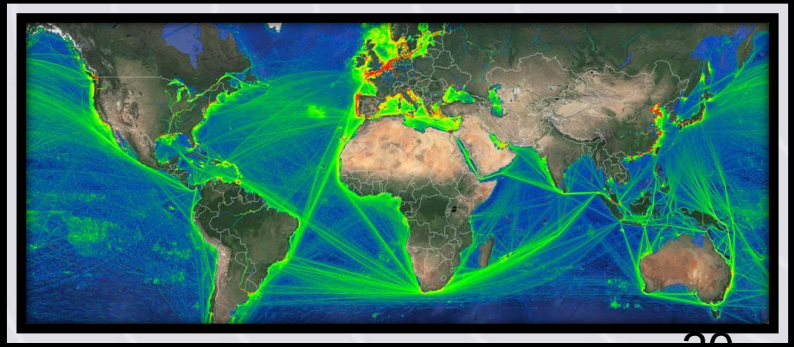


Spectrum of high-impact use cases









BDVA-HPC subgroup

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- Co-lead: María S. Pérez-Hernández (UPM)
  - mperez@fi.upm.es

- Roberto Martínez (UPM)
  - roberto.martinez@upm.es