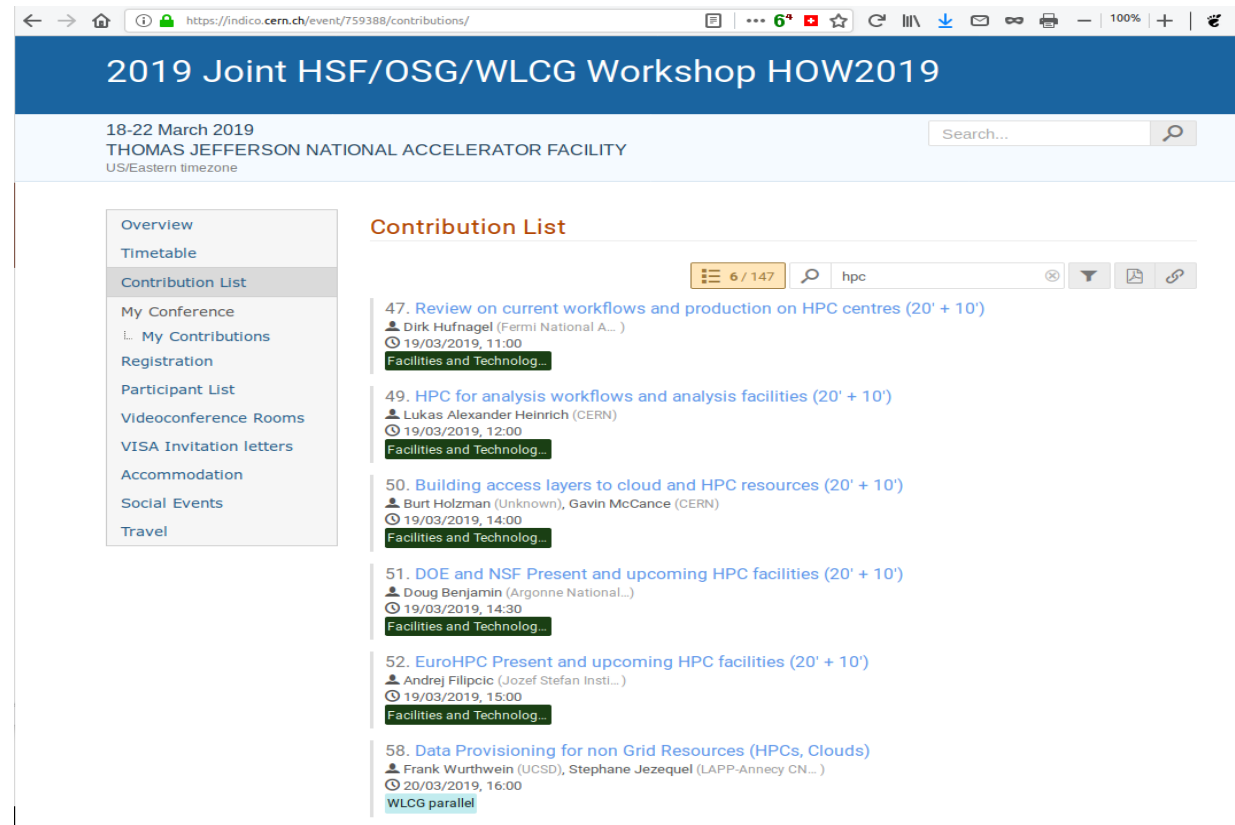


# LHCONE for HPC centres?

Umeå, LHCONE meeting - 5<sup>th</sup> of June 2019  
edoardo.martelli@cern.ch

# HPC and WLCG

Growing interest of LHC Experiments in HPC resources. Many presentations on the subject at the last HSF/OSG/WLCG workshop



The screenshot shows a web browser displaying the event page for the 2019 Joint HSF/OSG/WLCG Workshop HOW2019. The page title is "2019 Joint HSF/OSG/WLCG Workshop HOW2019" and the dates are "18-22 March 2019" at the "THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY". A search bar is visible on the right. On the left, a navigation menu includes "Overview", "Timetable", "Contribution List", "My Conference", "Registration", "Participant List", "Videoconference Rooms", "VISA Invitation letters", "Accommodation", "Social Events", and "Travel". The "Contribution List" section is active, showing a list of presentations with a search filter for "hpc".

Contribution ID	Title	Speaker(s)	Time	Category
47.	Review on current workflows and production on HPC centres (20' + 10')	Dirk Hufnagel (Fermi National A...)	19/03/2019, 11:00	Facilities and Technolog...
49.	HPC for analysis workflows and analysis facilities (20' + 10')	Lukas Alexander Heinrich (CERN)	19/03/2019, 12:00	Facilities and Technolog...
50.	Building access layers to cloud and HPC resources (20' + 10')	Burt Holzman (Unknown), Gavin McCance (CERN)	19/03/2019, 14:00	Facilities and Technolog...
51.	DOE and NSF Present and upcoming HPC facilities (20' + 10')	Doug Benjamin (Argonne National...)	19/03/2019, 14:30	Facilities and Technolog...
52.	EuroHPC Present and upcoming HPC facilities (20' + 10')	Andrej Filipcic (Jozef Stefan Insti...)	19/03/2019, 15:00	Facilities and Technolog...
58.	Data Provisioning for non Grid Resources (HPCs, Clouds)	Frank Wurthwein (UCSD), Stephane Jezequel (LAPP-Annecy CN...)	20/03/2019, 16:00	WLCG parallel

## HPC systems #2

- (Some) Our Funding Agencies are **asking CMS to be prepared to use national HPC infrastructures for a sizeable part of our needs, by RunIV**
- There are many not trivial problems to solve:
  - **Data access** (access, bandwidth, caches ...)
  - **Accelerator Technology** (KNL, GPU, FPGA, TPU, ???, ...)
  - **Primary architecture** (Intel, Power9, ARM, proprietary ...)
  - **Submission of tasks** (MPI vs Batch systems vs proprietary systems)
  - **Node configuration** (low RAM/Disk, ...)
  - **Not-too-open environment** (OS, Access policies,...)
- Since many problems are more political than technical, **CMS has prepared a document** to perform handshaking with HPC sites, and in order to
  - Explain our needs
  - Propose solutions (standard, ad-hoc)
  - Discuss out-of-the-box solutions for Future systems
  - **Can it become the basis of a common one?**
- **CMS plans a (virtual) trip to visit all the HPC sites, and establish direct links**

**Tech DOC**

[Exec Summary / political introduction](#)

### Report on HPC resources integration at CMS

#### Introduction

High Performance Computing (HPC) systems are highly not standard facilities, and are custom-built having in mind use cases largely different from High Energy Physics (HEP) ones. The utilization of these system by HEP experiments is not trivial: each HPC center is different and, of course, this increases the level of complexity from the integration and operations perspectives.

# Network access to HPC centres

How to better connect HPC centres?

DTNs have been used to transfer LHC data to/from HPCs.  
Should those DTNs get connected to LHCONE? How?

Any request already received from HPC centres?