Czech Hydrometeorological Institute

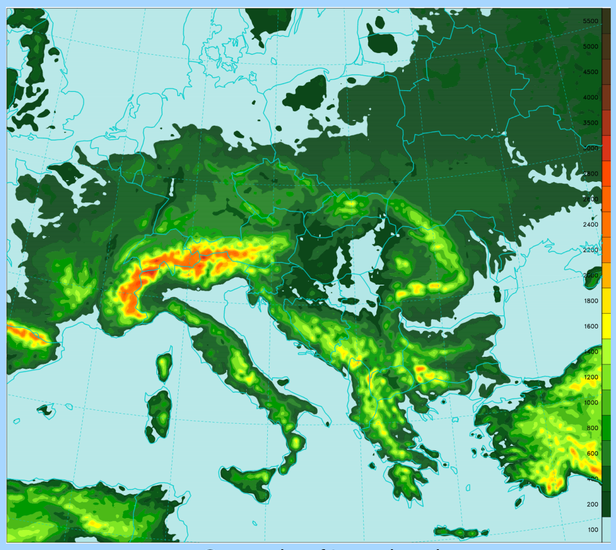
ALADIN@CHMI

Model set-up

- LACE domain (309x277 grid points, linear truncation E159x143, Δx~9km)
- 43 vertical levels, mean orography
- time step 360 s

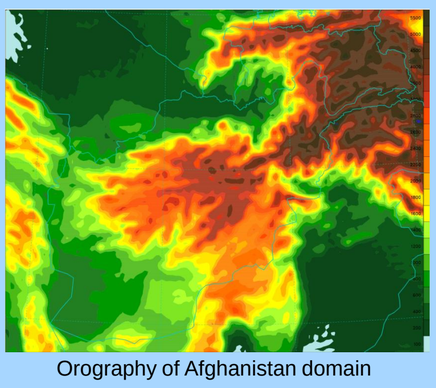
- OI surface analysis based on SYNOP (T2m, RH2m)
- digital filter spectral blending of the upper air fields, long cut-off cycle (6h cycle, filtering at truncation E61x55, no DFI in the next +6h guess integration)
- digital filter blending + incremental DFI initialization of short cut-off production analysis of the upper air fields
- 3h coupling interval
- ALADIN cycle 35t1_lentch (ALARO-0 with 3MT)
- OpenMP parallel execution
- 00, 06, 12 and 18 UTC forecast to +54h
- hourly off-line fullpos
- post-processing using obs-operators of OI

- hourly DIAGPACK analysis (SYNOPs)
- verifpack on CY32T1
- monitoring of SYNOP and TEMP observation based on OI quality control



Orography of Lace domain

ALADIN/Afghanistan



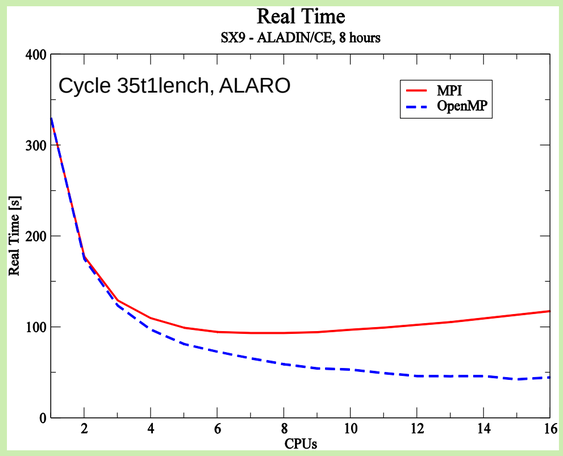
Orography of Afghanistan domain

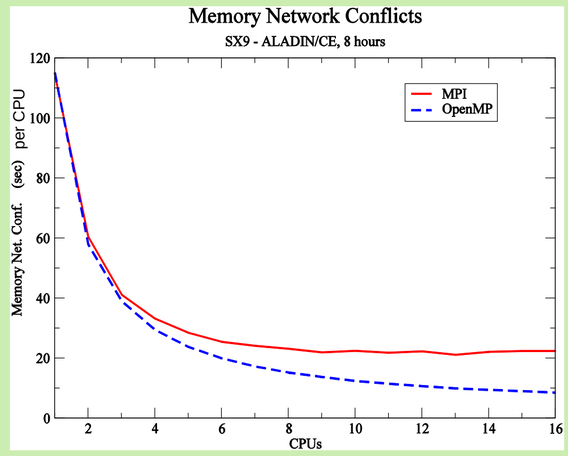
- domain (162x135 grid points, linear truncation E80x67, Δx=10km)
- 43 vertical levels
- time step 360 s
- digital filter spectral blending of the upper air fields (6h assimilation cycle, filtering at truncation E18x15)
- short cut-off production + incremental DFI initialization
- 3h coupling interval, ARPEGE driven
- ALADIN cycle 32t1 (ALARO-0 with 3MT)
- OpenMP parallel execution
- 00 and 12 UTC forecast up to +48h
- used mainly for weather service at Kabul airport

Major operational changes (April 2009 – April 2010)

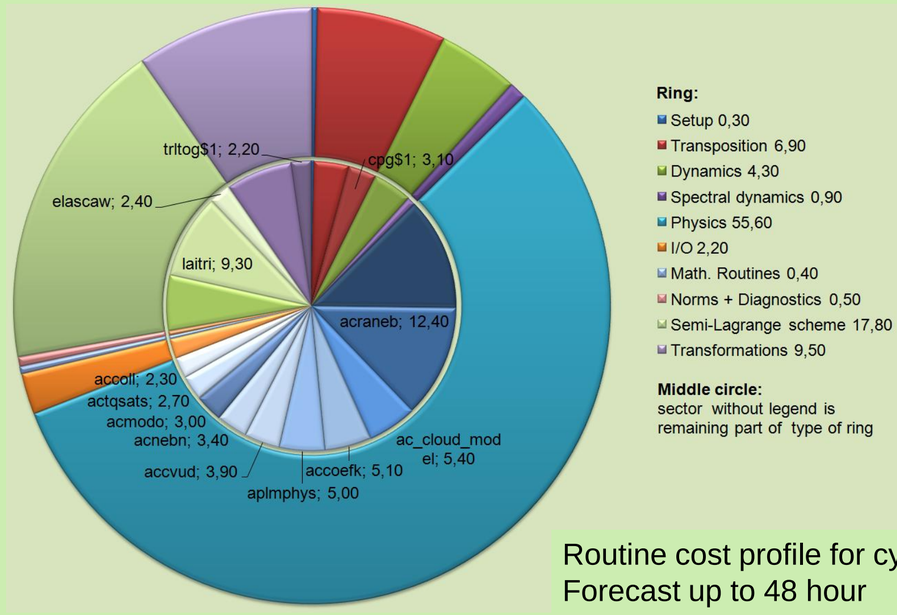
15	**Apr**	**2009**	switch to cycle CY35T1
5	**May**	**2009**	retuning of the T2m diagnostics
8	**Jun**	**2009**	new SL interpolator (less diffusive) with better conservative properties, new SLHD with increased diffusivity
26	**Aug**	**2009**	new diagnostic of cloudiness, new computation of KO index according to WMO standard instead of DWD way, new surface assimilation executable consistent with forecast
6	**Oct**	**2009**	New mixing length for the pTKE turbulence scheme, Bougeault-Lacarrere (M.W.R. 1989) type, due to problems with T2m in stable conditions not yet been accepted

Scalability of Aladin on SX9





Scalability of OpenMP parallelization is faster than MPI on single node. This is caused by memory conflicts. OpenMP keep constant total memory conflicts but MPI conflicts are function of number of CPUs.



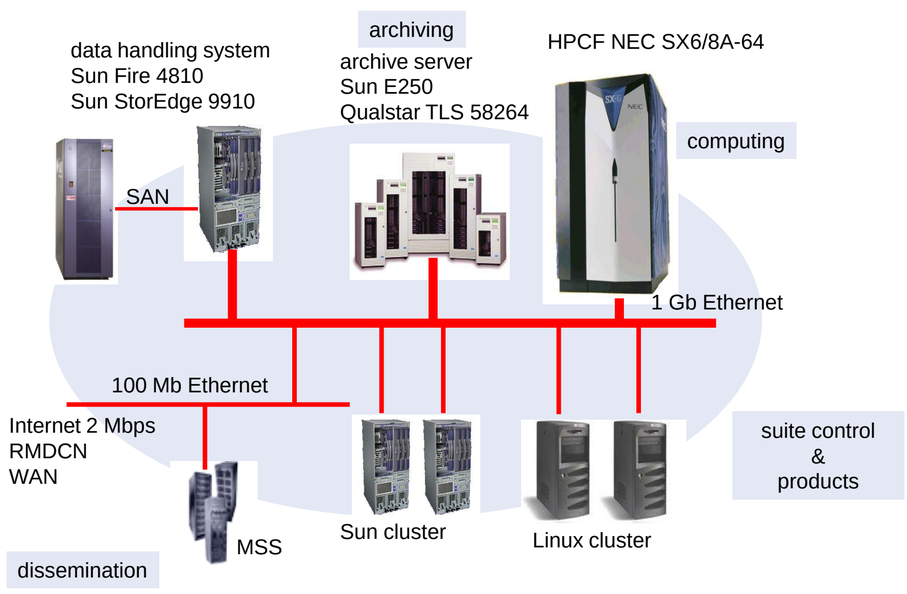
Routine cost profile for cycle 36t1 (ALARO)
Forecast up to 48 hour

Currently in Operational use

HW system:
- NEC SX-6/8A 64GB
- Linux cluster (suite control & products)

Operational team:
- 4 NWPers (on-call support)
- computer operators

The suite operated under SMS 4
Download of LBC via RMDCN



Migration to the new HW system in progress

New supercomputer NEC SX-9:
- two nodes
- 1.6 teraflops per node
- 1 TB RAM per node
- NQSII scheduler

New Front-End servers:
- two NEC Express 5800R140a-4 Enterprise Servers
  - 4 CPU Intel Quad Core Xeon X7350 each
  - 32 GB RAM each
- control suite, create products and disseminate

Shared disk file system:
- NEC gStorageFS - global file system (GFS)
- 118 TB usable space