National Centre for Atmospheric Science
NATURAL ENVIRONMENT RESEARCH COUNCIL

Cylc from the NCAS point of view
(NCAS Experience with Rose/Cylc)

Rosalyn Hatcher, Annette Osprey, NCAS-CMS
(Grenville Lister)

Joint final IS-ENES2 workshop on Workflow Solutions in Earth System Modelling and Meta-Data Generation during Experiments, Lisbon, Sept 2016

NCAS Rose/Cylc - Outline

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- NCAS-CMS – who we are
- Workflow - Historical Overview
- Rose/Cylc
  - Platforms
  - Suites
  - Management
  - Training
  - Future directions

NCAS Rose/Cylc – who we are

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NCAS Computational Modelling Services - http://cms.ncas.ac.uk

NCAS Computational Modelling Services

CMS provides HPC resource management and software engineering support for the UK atmospheric and polar science community, and delivers key underpinning infrastructure.

Potential users can contact CMS via the helpdesk or email to CMS staff.

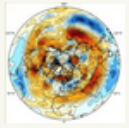
HPC Resource Management

- Managing CPU and storage allocations on national facilities
- Supporting the Met Office, EPCC, NERC and EPSRC on HPC delivery

Software Engineering Support

- Training
- Bug fixing, issue management etc
- Strategic projects

Infrastructure



- Repository and Workflow Management
- Tools and Utilities

Site Index

About CMS

About CMS
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Services

CMS Helpdesk
Accessing our Services
Training
Projects

User Support

Frequently Asked Questions
Documentation

User Information

Tools & Utilities
Unified Model
FCM
Rose
PUMA Service
MONSooN
ARCHER
Polaris
Mobilis

NCAS Rose/Cylc - Historical

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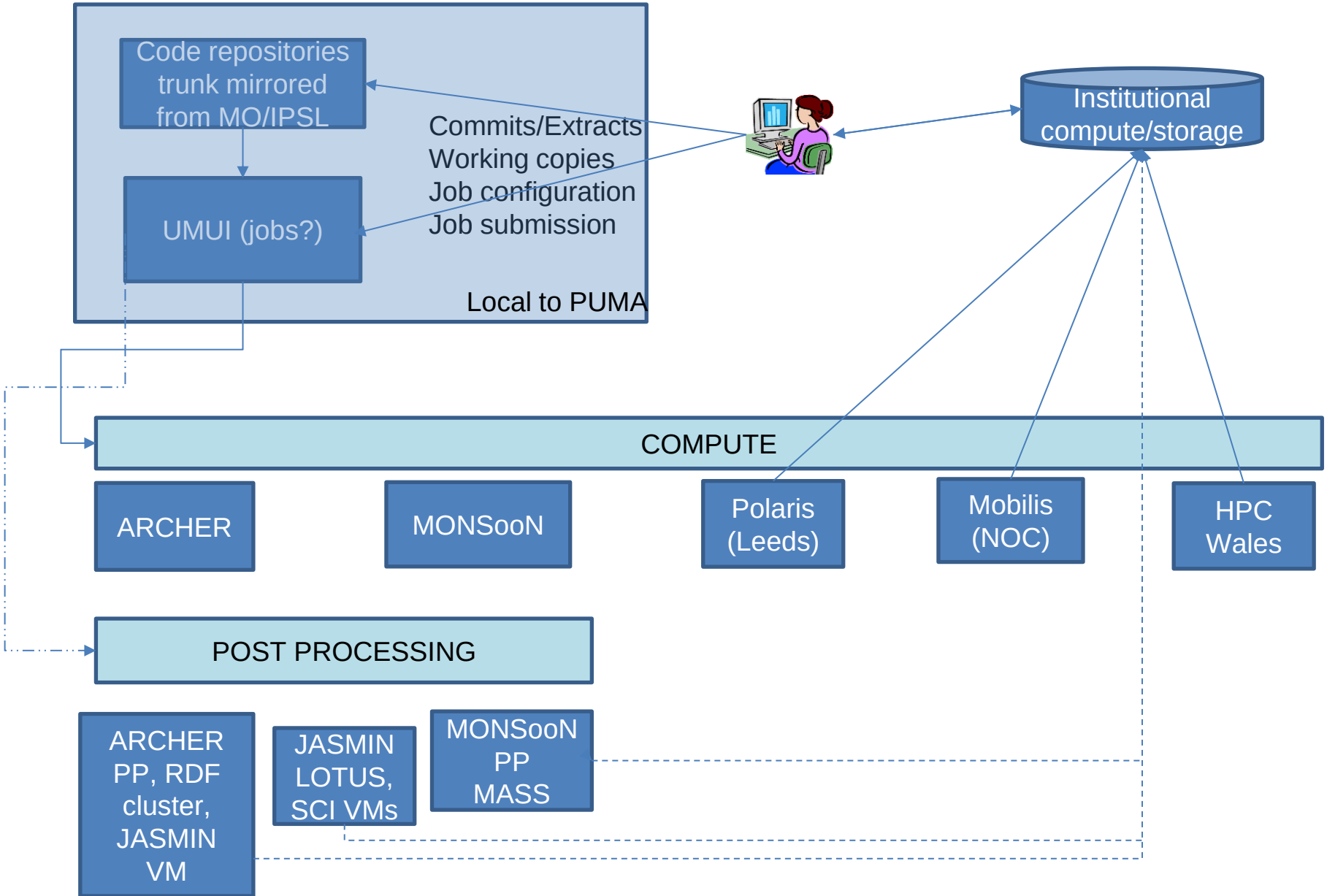

UM software (pre vn9.0)

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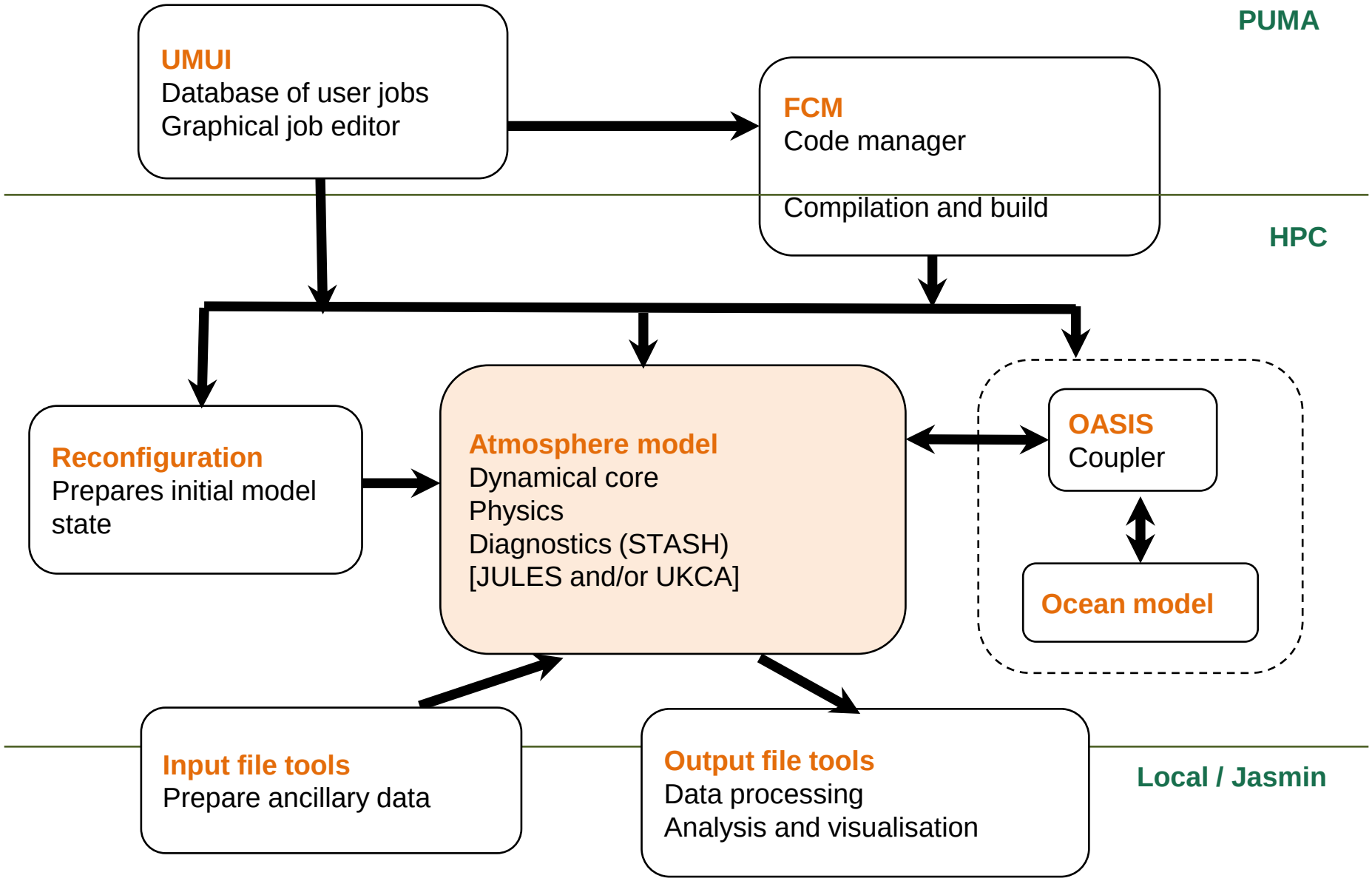

NCAS Rose/Cylc - Historical

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- Discovery – *ad hoc*
- Manage code – software engineering tools
- Configure/reconfigure experiment – manual process
- Manage job submission
- Manage job failure/continuation
- Manage output
- Post process
- Archive

How this works is highly dependent in individual users and frequently involves a good deal on manual intervention.

NCAS Rose/Cylc - MOSRS

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Met **O**ffice **S**hared **R**epositories (UM, JULES, etc)

Updated every 5 mins

another site

Make code changes

Local Mirror of Shared Repositories

Extract code into Rose suite

PUMA

Local Mirror of Shared Repositories

Make code changes

Extract code into Rose suite

NCAS Rose/Cylc

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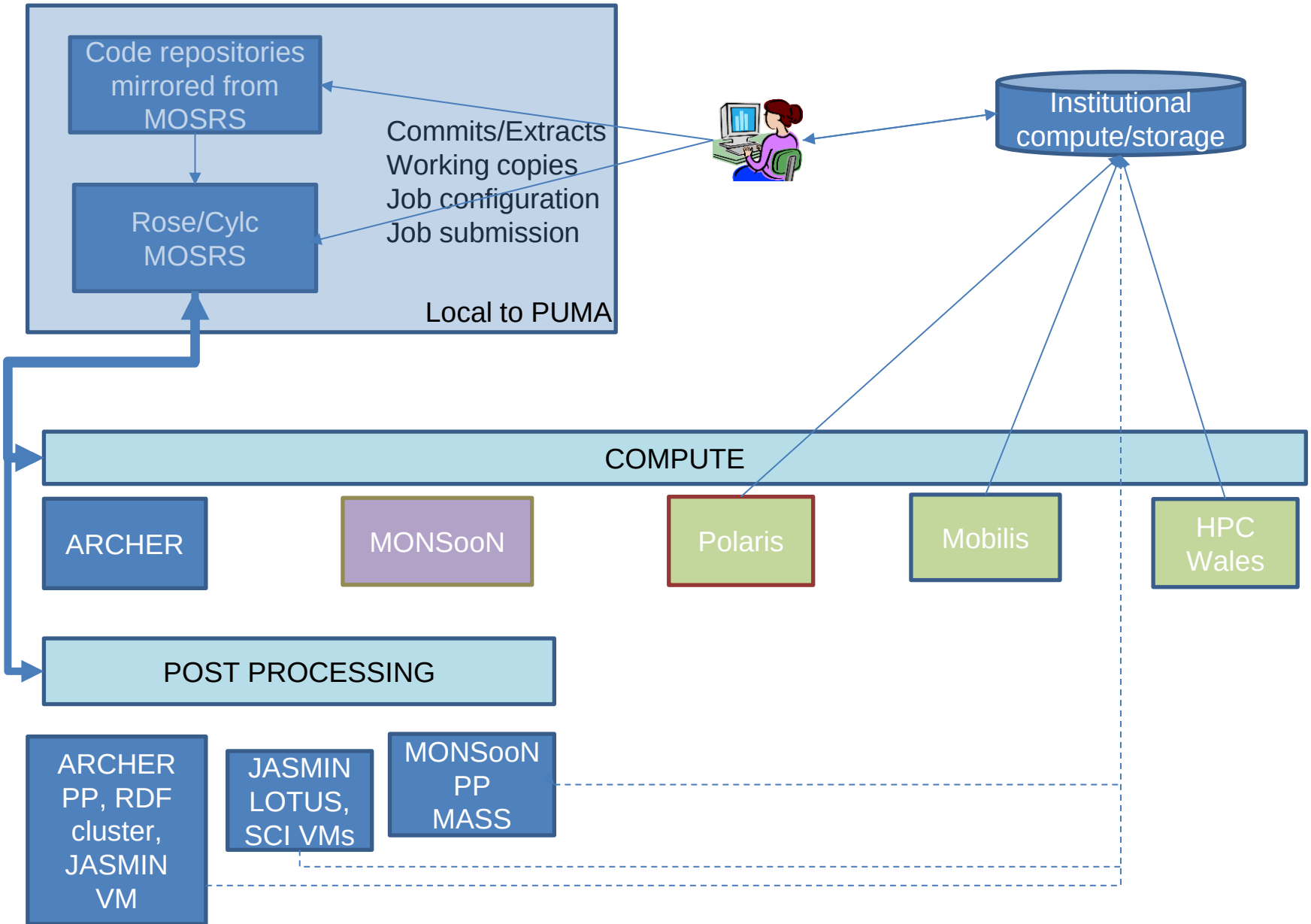

UM software (vn10.0 onwards)

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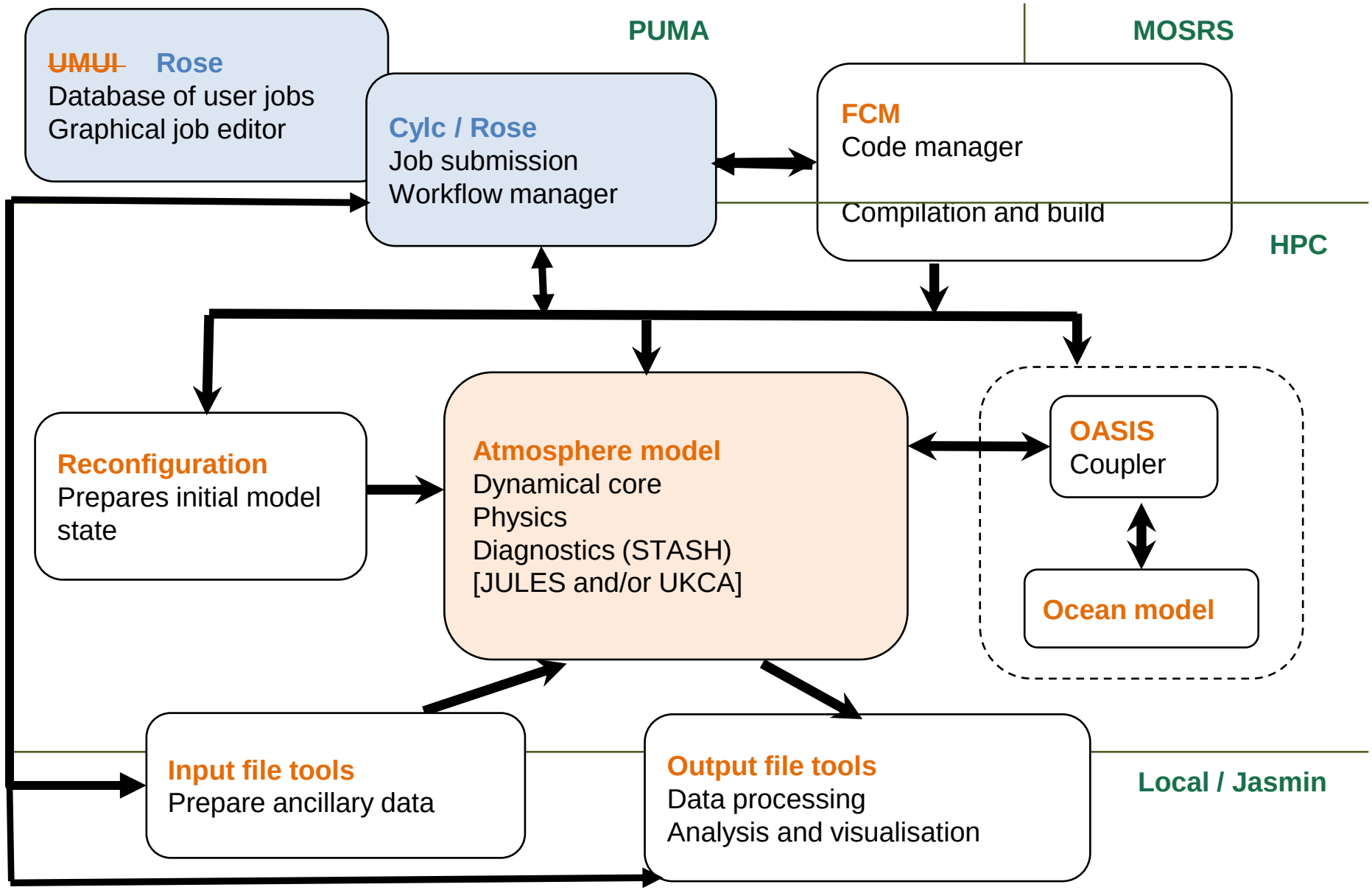

NCAS Rose/Cylc - Platforms

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- PUMA (cylc daemons, polling)
- ARCHER
  - Service nodes
  - RDF Analytics cluster
- JASMIN
  - jasmin-xfer1
  - jasmin-cylc (MO)

76 Rose/Cylc users

MONSooN (MO managed)

Lander
Rose VM
Cylc VM
HPC
PP

119 Rose/Cylc users

- JASMIN-Reading (running jules locally)
- Polaris (on the way)

NCAS Rose/Cylc - Suites

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- Many suites!
  - Initial proliferation (support)
  - Greater convergence

Standard Suites (?)

- GA7 – ACSIS/FEBBRAIO
- GC3 – HighresMIP
- GO5
- NEMOVAR
- UKESM
- Nesting

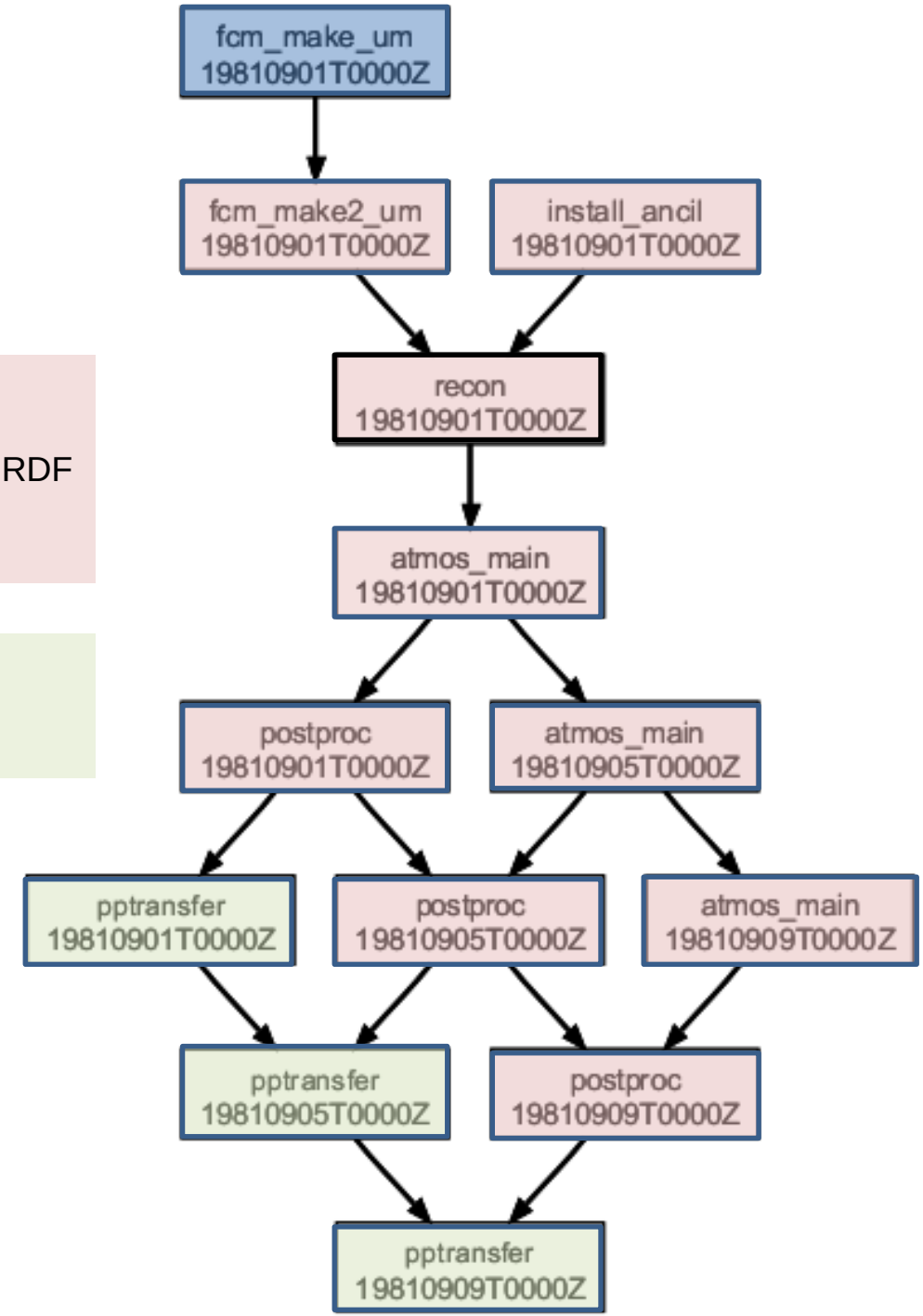
Suite development in production runs

Many moving parts/points of failure

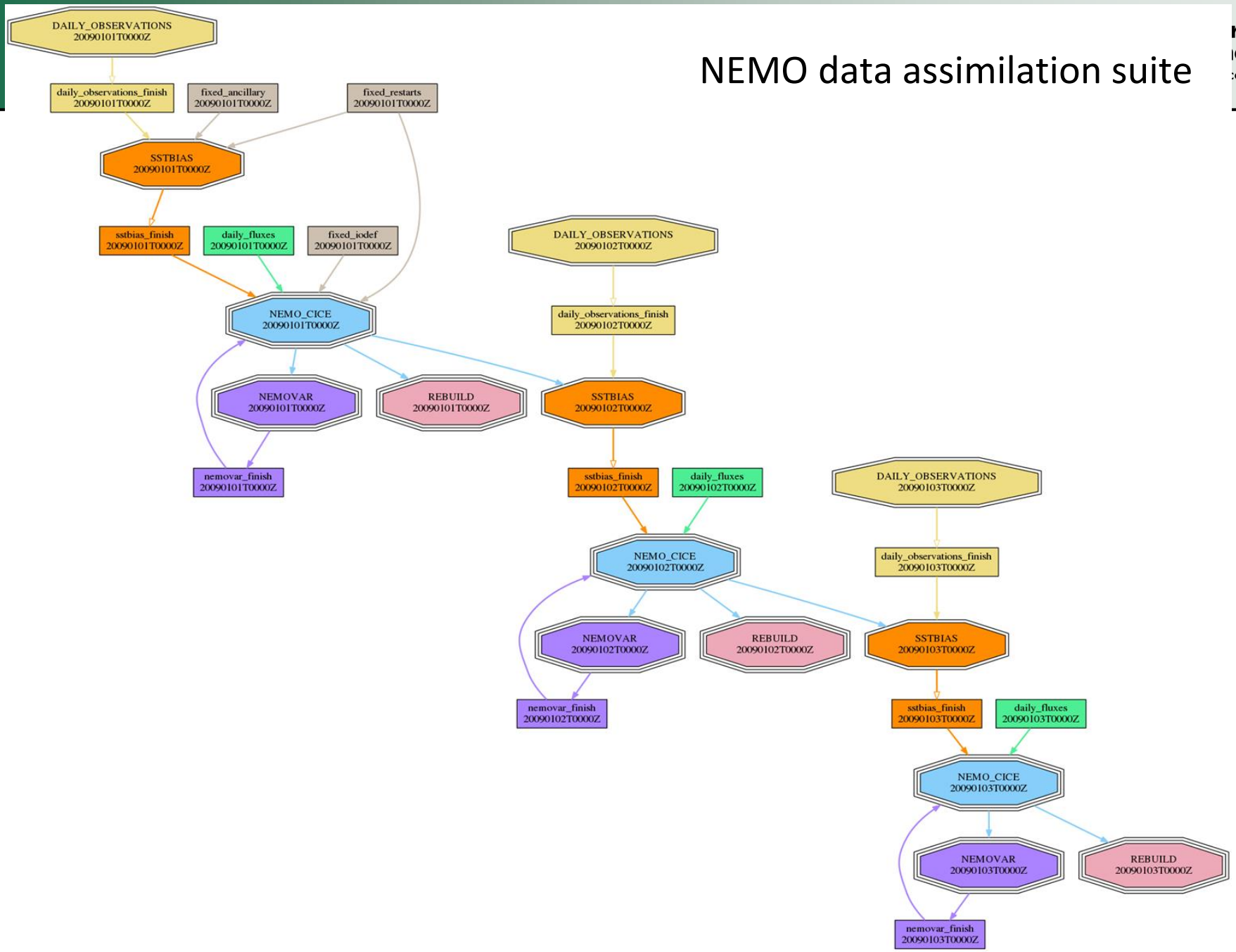
post processing

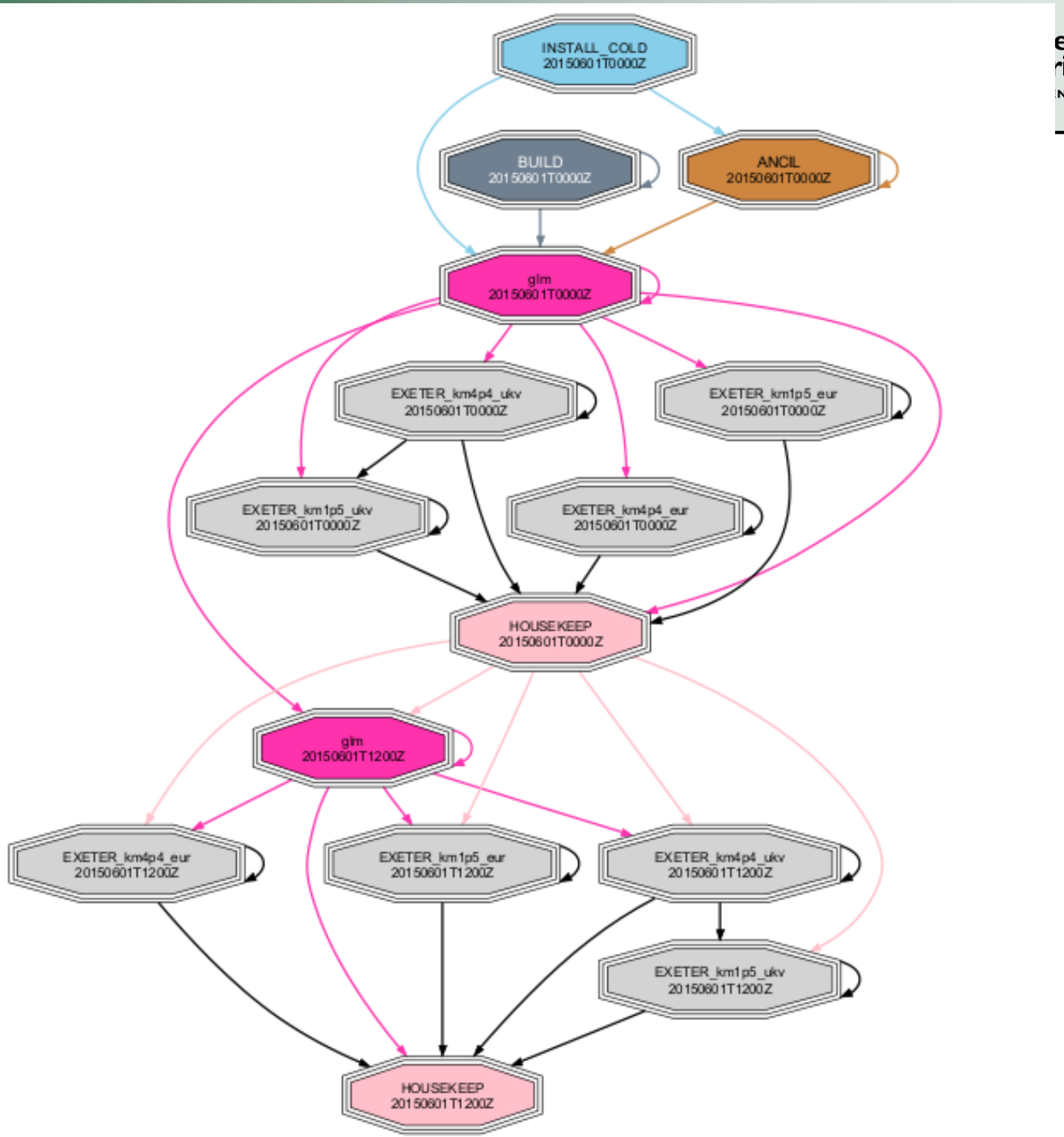
postproc
file conversion
move from scratch to RDF
remove from scratch
checksum

pptransfer
pull files to jasmin
checksum



NEMO data assimilation suite

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BUILD
20150601T0000Z
ANCIL
20150601T0000Z
glm
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EXETER_km4p4_ukv
20150601T0000Z
EXETER_km1p5_eur
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20150601T0000Z
HOUSEKEEP
20150601T0000Z
glm
20150601T1200Z
EXETER_km4p4_eur
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EXETER_km1p5_eur
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EXETER_km4p4_ukv
20150601T1200Z
EXETER_km1p5_ukv
20150601T1200Z
HOUSEKEEP
20150601T1200Z

NCAS Rose/Cylc - Training

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All but retired our UMUI-based training!

- UMUI Conversion course (Sept 2016, Spring 2017)
  (http://cms.ncas.ac.uk/wiki/UmTraining/RoseSept2016)
- 3-day UM Introduction (November and April) – Rose/Cylc based
- 5-day UKCA Training (January 2016) – Rose/Cylc based
  (http://www.ukca.ac.uk/wiki/index.php/UKCA_Training_January_2016)

NCAS Rose/Cylc – Management …

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Management

- Installation/testing of new releases and upgrades
  - Consistency across platforms
- UM, GCOM, other installation/testing – Rose-stem

Still learning about the capabilities of the system

Support

- Porting suites
- Troubleshooting/debugging
- Increased level infrastructure support
  - eg users writing their own guis

NCAS Rose/Cylc - Future

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- PUMA – central submission hub
  cloud-based PUMA (JASMIN VM)

NCAS Rose/Cylc - Future

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- PUMA – central submission hub
  cloud-based PUMA (JASMIN VM)

- UM in the cloud – experiments in AWS ongoing
  Rose/Cylc control?

NCAS Rose/Cylc - Future

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- PUMA – central submission hub
  cloud-based PUMA (JASMIN VM)
- UM in the cloud – experiments in AWS ongoing
  Rose/Cylc control?
- MIP data workflow