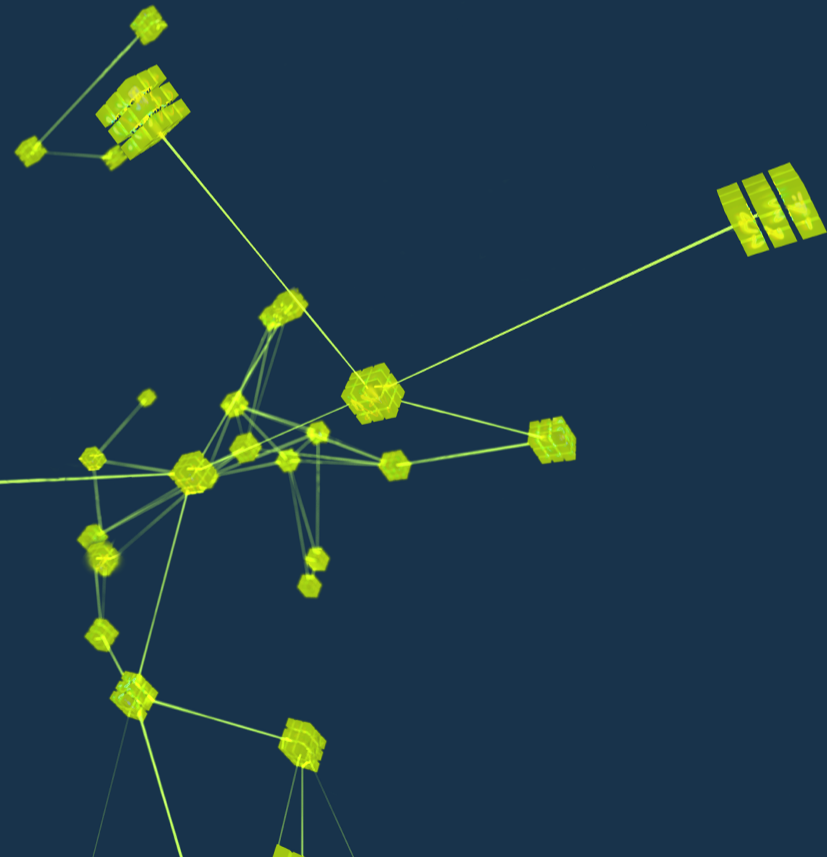EPICS Collaboration Meeting September 2022

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EPICS Build and Deployment
Report on the Tuesday Workshop

General:

- ~75 registered participants (50-60 attending)
- Two main areas of interest:
  - Management of building many dependent modules with individual release cycles
  - Deployment and execution of operator tools and IOCs for development, test and production
- Eight contributions discussing the solutions at different places:
  e3 (ESS), sumo/rsync-dist (BESSY), sumo/Conda (APS-U),
  CODAC Core System distro (ITER), RPM packaging (NSLS-II),
  Nix based deployment (CEA), IOCs in Docker (PANDA),
  IOCs in Docker using Helm/Kubernetes (Diamond)

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Building Modules:

- Flexible: Tool using a database that manages the dependencies and the built version sets
  sumo (BESSY, APS-U), e3 (ESS)

- Rigid: Release of fixed version sets
  CCS Distribution (ITER), Mega-RPM (NSLS-II)

- Using a CI/CD system
  everyone

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Deployment of Libraries and Applications:

- System package managers
  CCS (ITER), NSLS-II, FRIB

- System independent package managers
  Conda (APS-U), Nix (CEA)

- Containers
  Docker (Diamond, PANDA), Singularity (BESSY; for OPI apps)

- Remote copy of structures (w/ tags, soft link switching)
  rsync-dist (BESSY; for IOCs)

- Shared file system (NFS)
  e3 (ESS)

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Linking IOCs:

- Using a Python wrapper to resolve dependencies and load shared libraries from NFS when starting the IOC
  e3 (ESS)

- Linking shared libraries that are installed by package managers
  most places

- Linking shared libraries that are inside containers
  Docker (Diamond, PANDA), Singularity (BESSY; for OPI apps)

- The era of static linking is over

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Different Requirements/Goals:

- IOCs need to run on different (less predictable) host systems

- Free the app developer from having extensive knowledge of module versions and dependencies

- Stability / reproducibility vs. ability to quickly provide bugfixes

- Fixed sets of versions are easier to test and maintain

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For Reinventing the Wheel:

There's no better place to do that… 1st wheel (found near Ljubljana)

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It Seems That...

- Everyone has an implementation that meets their requirements and needs some improvements here and there

- Everyone would love to collaborate – on *their* solution

Are B&D solutions the "display manager of the 2020s"?

Thanks a Lot to the Contributors:

Timo Korhonen (ESS): **e3 (ESS EPICS Environment)**

Thomas Birke (HZB/BESSY): **SUMO and rsync-dist**

Andrew Johnson (APS): **C2 – SUMO and Conda for APS-U**

Anze Zagar (ITER): **Packaging and deployment in CODAC Core System**

Anton Derbenev (NSLS-II): **Packaging and deployment at NSLS-II**

Rémi Nicole (CEA): **EPNix – Nix-based EPICS packaging**

Florian Feldbauer (PANDA): **Running IOCs in Docker containers**

Ronaldo Mercado (Diamond): **Running IOCs using Kubernetes**

Talks and Zoom recording will be available from the meeting website.

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