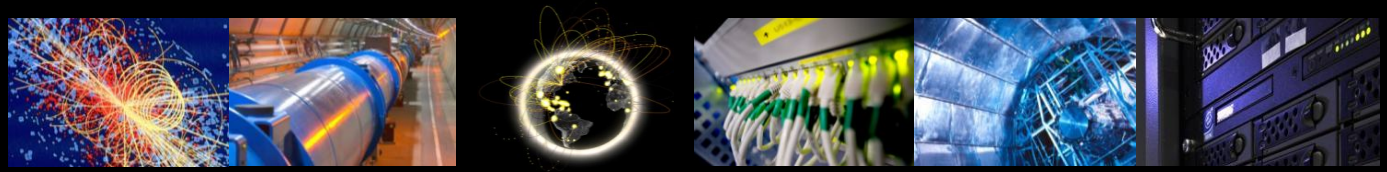
WLCG Experiments Test Framework Update

Marian Babik, CERN

IPv6 F2F, June 2021



WLCG Worldwide LHC Computing Grid

Open Science Grid

News

- Checkmk 2.0 was released
  - Adds Kubernetes, AWS, Azure, VMware monitoring, improves Docker monitoring and integrates with Prometheus, Grafana. Also introduces new network monitoring (ntop).
  - REST API is introduced in this release
- ETF
  - New job submission framework (jess) and new worker node testing now in production for all the experiments
  - CREAM-CE testing was retired
- New ETF central instance
  - Shows tests from both IPv4 and IPv6 nodes for ATLAS and CMS
  - There are many CEs in dual-stack, but blocking access over IPv6
- CMS now uses native arc client and ARC's AREX backend to submit jobs
  - Motivated by high latency of the HTCondor/ARC GSIFTP backend
  - The plan is to migrate back to HTCondor once it supports submission via ARC REST
- ETF -> MONIT/Sitemon interface
  - Agreed on a plan for Sitemon to integrate IPv6 metrics

Plugins/Tests

Plugins	Users/Experiments	Maintained by
Job Submission		
ARC, HTCONDOR-CE	LHCb, ALICE, ATLAS, CMS, DUNE	ETF
Worker Nodes		
ATLAS (3), CMS (11), LHCb (7), DUNE(1)	ATLAS, CMS, LHCb, DUNE	ATLAS, CMS, LHCb, DUNE
Storage		
GFAL2 (SRM, gsiftp, XRoot, HTTP)	ATLAS	ATLAS
GFAL2 (SRM)	CMS	CMS
XRoot**	CMS	CMS
~~HTTPs/WebDAV**~~	HTTP TF*	HTTP TF*
Network		
perfSONAR infrastructure**	WLCG Network Throughput WG	OSG, WLCG

**Uses new library for writing plugins (python-nap) *Probe no longer supported by GFAL2 team

Challenges and Plans

- Started working on support for tokens
  - IAM infrastructure on dual-stack will be needed
  - Plan is to integrate token support alongside x509
- Updates to Checkmk 1.6 and C8
  - Added new authentication backend, which can be extended to support OpenID/SAML
  - psetf.aglt2.org and etf.cern.ch already running Checkmk 1.6
  - Evaluating C8 middleware support
- WN IPv6-only testing
  - Requires a developing a smoke test to check and test IPv6 connectivity on the WN
- Python 3
  - ETF infrastructure is ready, but some of the probes will need to be migrated
  - Both CMS and LHCb plan to work on storage probes (but not much progress recently)
- IPv6 results in Sitemon/MONIT
- K8s prototyping ongoing (to be tested in QA later on)
  - Plan is to migrate to full Auto DevOps model (with Helm/Flux) and consolidate resources

Questions ?

Docs: https://etf.cern.ch/docs/latest/

New central instance: https://etf-10.cern.ch/etf/check_mk/

Instances (access requires IGTF/x509 cert loaded in the browser):

CMS production	CMS QA IPv6	CMS QA	Code: CMS gitlab
ATLAS production	ATLAS QA IPv6	ATLAS QA	Code: ATLAS gitlab
LHCb production		LHCb QA	Code: LHCb gitlab
ALICE production		ALICE QA	Code: ALICE gitlab
pS production		pS QA	Code: pS gitlab

ETF framework

ETF core containers ETF Job Submission (Jess)

ETF nagios plugins lib. NAP ETF rule-based configuration (ncgx)

ETF support channels: GGUS: Grid Monitoring or etf-support@cern.ch (SNOW)

Summary

- ETF is a container-based application combining open source software with a set of frameworks and APIs to provide flexible testing suite
- Easy to extend, re-locate and support new experiments and technologies
- Supported as part of the CERN IT Monitoring Stack
- Currently deployed at CERN for five experiments
  - Supporting IPv4-only and IPv6-only testing
  - Experiments contacts have access in case they need to debug and/or follow up on issues
  - Central instance provides a site-level view (one place to see results from all experiments)
- Additional deployment at OSG for perfSONAR infrastructure monitoring
  - Strong interest from other communities to have this available as a generic tool
- Feedback welcome via standard support channels or directly
  - Experiments priorities for different tasks and new use cases best communicated via tickets
  - Technical issues/merge requests can be added directly via gitlab

Jess

- **Simple job submission framework used to develop ETF JS plugins**
  - Independent (not tied to Nagios), rewrite from scratch
- **Pluggable** - easy to extend to support different submission systems
  - Direct submission to ARC, CREAM and HT-Condor-CE
  - Submissions via local HT-Condor (to ARC/CREAM/HTCondorCE and potentially other backends supported by HT-Condor)
  - **Submissions via remote HT-Condor pool**
  - ETF can also host a **local HT-Condor pool** (in a separate container) to which remote startds can connect (implements pull-based submission model - tested for CMS DODAS)
- Generic **job tracking and monitoring**
  - Currently tracking a single job per CE; can also be extended to track multiple jobs/CE
  - Manual re-scheduling of job submissions via web interface improved
  - Full log(s) of the running job (details depend on the backend)
- **Support for configuration/env on the worker nodes**
  - This can be configured by the experiments in the ETF core plugin (per host/service/site)
- Drops length limit on the worker node results and job submission results

WN-μFM

- **Micro-framework to execute tests on the worker nodes**
  - Moving away from a statically compiled nagios binary
- Supports basic scheduling of tests
  - Can run tests in parallel (configurable), can timeout/kill runaway tests
  - Initial support for alternate schedule of tests (execute once every 3 runs)
- Runs nagios standard compliant tests
  - **Supports performance metrics readout** (numerical values)
- Configured directly from ETF frontend
- **WN environment setup**
  - Using env/config passed from JESS (via env file) - easy to pass variables directly from frontend to the WN (like sitename, paths, originating CE/queue, etc.)
- Support different backends for metric output
  - Directory queues, message queues, json, http upload, etc.
- **Can also run as a standalone component**
- **Supports py 2.6, 2.7 and 3.4+; statically compiled version also avail.**