IT/RCS Service Criticality Review

Compute & Devices Group (IT-CD)

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CERN IT/RCS Technical Committee - 24 May 2024

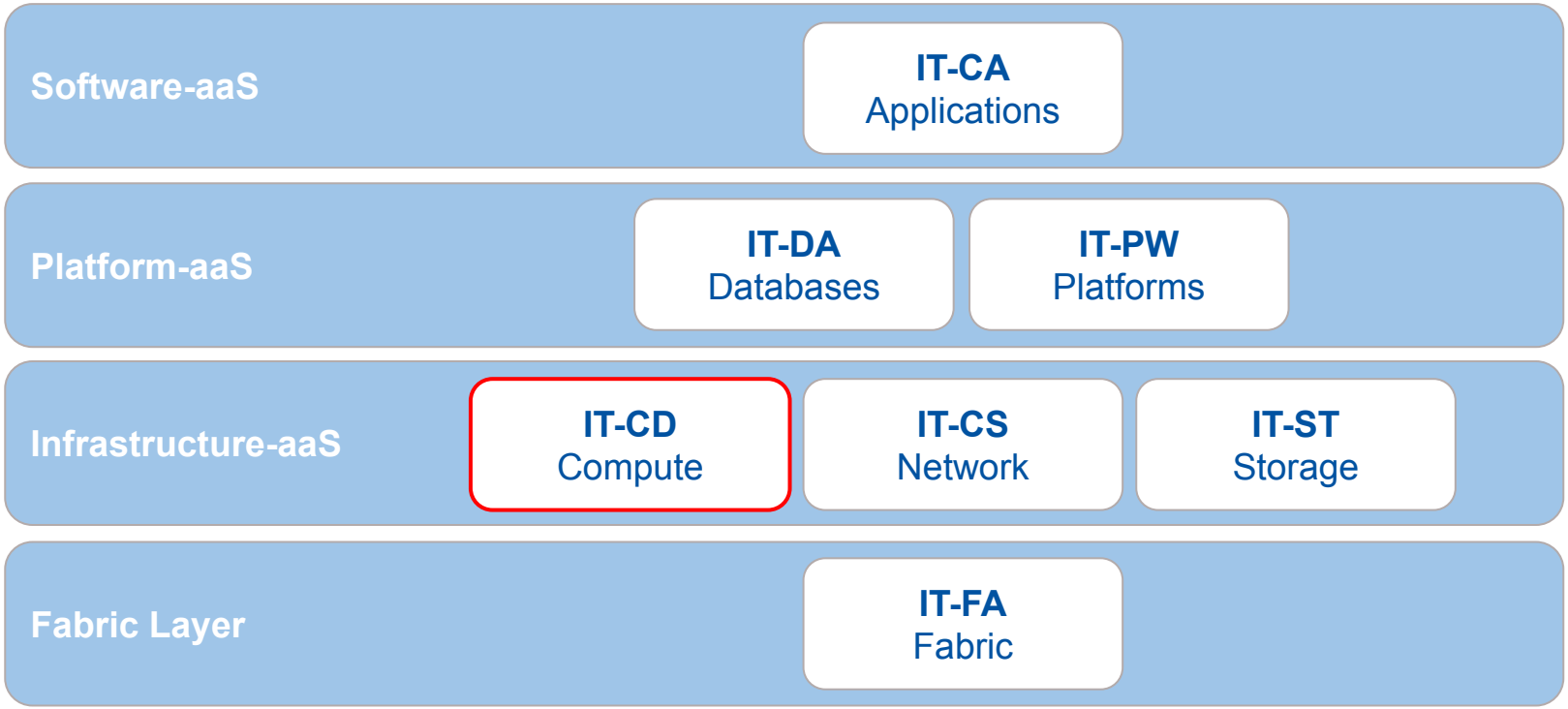
Outline

The ‘Compute & Devices’ group in IT

Criticality review: objectives & approach

An IT-CD services subset in detail

The Compute & Devices Group in the IT context



IT-CD Structure and Services

IT-CD: Compute & Devices

Compute & Configuration Services

lxbatch, HPC, GPU, lxplus & aiadm, acron, DNS LB, ARGUS,
BDII, ETF & HammerCloud, MyProxy, VOMS, Tier-0 Accounting,
Puppet & Teigi/Vault, CertMgr, CERNMegaBus, Eng Licenses

Cloud & Linux Services

OpenStack-based private cloud
Linux Support & Linux Building

Devices & Productivity Services

Active Directory, Windows Infrastructure, MacOS, iOS & Android
MS Office, Anti-Virus, Windows Client Support & CMF, CERNTS

Criticality Review: Objectives

➔ Better understand RCS dependencies on services

- Establish mutual “service” understanding
  - OpenStack, Linux Support
- Identify use cases IT is not aware of
  - `alibuild01` vs hostgroup
  - Runtime vs recovery vs workflow dependencies

Classification of service decisions
(user-facing, IT)

➔ Establish “objective” service criticality

- User-facing vs. implicit dependencies
  - Active Directory underpinning basically all services
  - acron *may* be used in critical workflows
- Impact vs urgency
  - Time-sensitivity

Consistent service criticality ‘ranking’
(RCS, IT)

Criticality Review: Approach

FOR critical_services FROM ‘Linux Support’ BY 1 TO OpenStack WHILE critical_services≠”” DO

- ➔ **Identify “outliers” in RCS criticality input**
  - **Surprises?**
- ➔ **Disentangle criticality aspects**
  - **Detector operation & data taking**
  - **Risk of data loss**
  - **Runtime, recovery, workflows**
- ➔ **Make suggestions for service changes**
- ➔ **Clarify & discuss**

OD

- ➔ **Address questions sent up-front**

IT-CD	*OpenStack, LxPlus, AD* *Acron, HPC, Myproxy* *Remote Access inc. CERNTS and SSH tunnelling* *Software Licence Servers, Linux Support* *LxBatch, HTCondor, Hammercloud, CEs, Config Management, Mathematica*

- **critical**
- **critical for some**
- **not for critical use**
- **no issues to discuss**

OpenStack Private Cloud Infrastructure

- **Ranked #2 overall**
  - Seems extremely high!
  - Varies from 0..100
- **Availability of VMs vs API?**
  - VMs have no dependency on “OpenStack” control plane
  - VMs are only dependent on their hypervisor
  - Power and network should be enough
- **Runtime dependencies on the API?**
- **Recovery dependencies on the API?**

OpenStack API dependencies:

- Network
- Active Directory
- DB-on-demand
- Ceph for volumes and BFV

LxPlus: Linux Public Login User Service

➔ Ranked #8 overall

- Seemed high initially, now better understood!

➔ Embedded in *many* workflows

- Remote shifters (mixed with “Remote access”)
- “tunnel” availability may focus on `lxtunnel`
- “Equality contract” with LxBatch key aspect?
- + analysis, coding, papers … interactive workhorse!

➔ Future of lxplus8?

- Small user base (10x smaller than lxplus9)
- Extra effort due to EL8 vs EL9 differences
- Crucial for CMS – retirement towards end of the run?

The LXPLUS Service

LxPlus direct dependencies:

- Network
- AFS (unless homeless)
- Active Directory (Kerberos login)
- Ceph for volumes (`/tmp`)

Active Directory

➔ **Ranked #7 overall**

- Should probably rank right after Network
- Combined with Kerberos & SSO

➔ **Many implicit dependencies**

➔ **AD is underpinning basically everything**

Active Directory dependencies:

➢ Network

Authenticated CRON (acron)

- ➔ **Rated 0 by most LHC experiments**
  - ATLAS and SME use cases
  - Workflow engine?
- ➔ **Example of workflow dependency**

acron dependencies:

- ➢ Network
- ➢ Active Directory
- ➢ AFS

High Performance Computing (HPC)

- ➔ **Rated 0 by all LHC experiments**
  - Rated 100 by TH
  - Expected (same as Software License Servers)
- ➔ **Example of workflow dependency**

HPC dependencies:

- ➢ Network
- ➢ Active Directory
- ➢ Ceph

MyProxy

- ➔ Medium criticality rating overall
- ➔ Unavailability will stop Grid jobs (at some point)

MyProxy dependencies:

- ➢ Network
- ➢ Ceph
- ➢ Load-balancing

Remote access (ssh tunneling and CERN TS)

- ➔ Linux-based: see above (lxplus)
- ➔ Windows: CERNTS dependency (ALICE)

CERNTS dependencies:

- ➢ Network
- ➢ Active Directory
- ➢ EOS

HammerCloud

- **Used by ATLAS & CMS**
  - Extrapolated, HC would rank higher than #10

- **Errors in HammerCloud availability would render grid sites offline (or at least reduce efficient utilisation)**

- **Currently being migrated to Py3, new SSO, and out of CentOS7**

HammerCloud dependencies:

- Network
- SSO (AD)
- Database-on-demand (DBOD)
- CVMFS
- CRIC

Linux Support (& Puppet)

➔ Rated 0 by all LHC experiments

- Configuration Management: several times rated 100
- “Linux Support” may be a slight misnomer …

➔ Example of recovery dependency

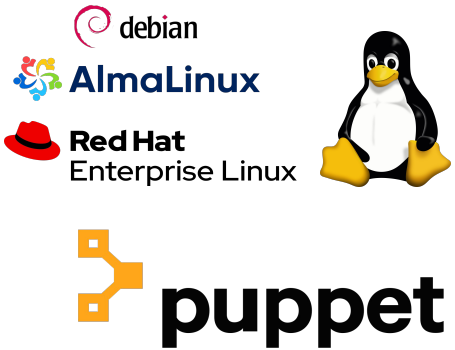
- Installation of physical nodes not possible (AIMS, linuxsoft)
- Installation of virtual machines unlikely to work (linuxsoft)
- (Configuration needs to be manual)
- (Containers should be ok, unless they install/update packages)

➔ Also a workflow dependency?

- No central package building or publishing

Linuxsoft dependencies:

- Network
- Ceph
- ORACLE

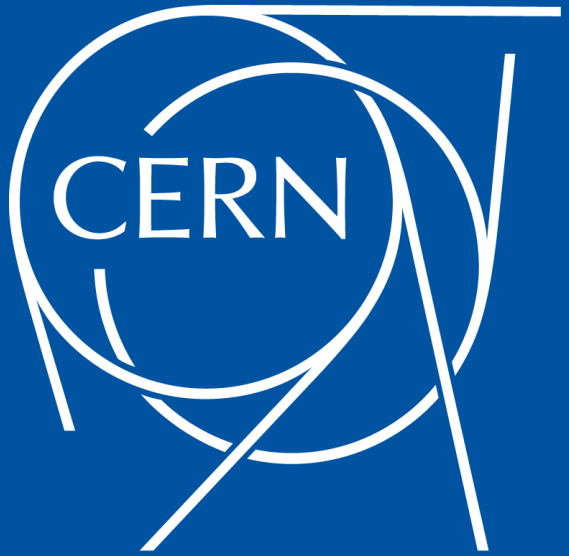


Questions sent upfront

- **ARGUS: What aspects of authentication for operation & production rely on it?**
  - Policy-based authorisation service for distributed / WLCG services
  - Mostly migrated to IAM
  - Decommissioned with EL7 end of June 2024
- **CERNMegaBus: Does any critical alerting system rely on it?**
  - Extension of IT messaging service for easy integration (data centre shutdown)
  - Unavailability will not impact any other critical alerting system
- **CERTMGR: What is the relation with SSO?**
  - Creation, provisioning, and renewal of host certificates
  - Unavailability will prevent Puppet configuration of centrally managed hosts
  - SSO should not rely on CERTMGR
- **Teigi: What is its importance for the configuration management system?**
  - Teigi is the secret store for Puppet
  - Unavailability will break the configuration of Puppet-managed hosts

Summary

- ➔ **Helped with understanding of RCS use of CD services**
  - Hope this was helpful to understand services better?
- ➔ **Input to compile adjusted criticality ranking**
  - Include implicit dependencies & better understanding
  - Distinction between runtime, recovery, and workflow?
- ➔ **From IT-CD:**
  - **lxplus8 decommissioning by the end of the run?**
    - ↳ ***Before*** **the EOL of EL8 (~2026 vs June 2029)**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