# CERN's Business Continuity Working Group

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# What Happens to Your Organisation If...

- There is a fire in one of your data centre rooms?

- A floor of your data centre is seriously flooded?

- A tree falls on the main power line supplying your data centre?

- Your organisation is attacked by ransomware?

- An aircraft or lorry crashes into your data centre?

- …

- A storage cluster crash brings down a huge number of databases, corrupting some of them?

- A block storage service crash brings down a large number of services, corrupting some of their data?

  - And that way, you learn about dependencies you did not know about?

- ...

# What Happens to Your IT Department if...

- … anything like that happens

and

- … there are several data centre rooms or buildings

or

- … there are external resources (e.g. clouds) available?

Does your IT department look stupid? Do you?

# At CERN...

- … we have asked ourselves these questions several times
  - In particular when new options became available: The (past) Wigner-Budapest extension to the WLCG Tier-0, the (future) PCC (Prévessin Computer Centre)
  - Even though possibly inspired by these options, the question is more general
- CERN's IT Management decided in 2019 to look at the problem in a more systematic way

# Business Continuity Working Group

- April 2020: CERN-IT formed a working group

  - 10 experienced people representing all technical groups, computer security etc.

  - Mandate:

    - Formulate recommendations targeted at increasing resilience of services during disruptions

    - Reduce impacts of disruptions

    - Provide plans for restoring services

# Dimensions of BC

- User view: business case
  - How important/critical is a given service?

- Service owner / service manager view: service implementation
  - Dependencies, effort to restore, …

- Overarching dimension: threats
  - Surely they influence the service view
  - But may impact the user view as well – a major disruption may justify longer time to restore

# Business Cases

- Potential classification of services:
  - Emergency services (back within one hour)
  - Essential administrative services (back within a day)
  - Basic working services (back within a few days)
  - Services required by external sites (back within a week)
  - Services required for accelerator running (back within one or two weeks)
  - First level for normal business (back within several weeks)
  - All other services (back within a month or even more)

- Unlike threats and dependencies, need interaction with users (and budget holders, with perhaps different views) in and beyond IT

  - Consider potential constraints by formal agreements, MoUs, …

- How to ensure that views remain up-to-date with reality?

# Service View – Dependencies

- Suggested categorisation:
  - Essential for keeping service running
  - Essential for re-starting service in present form
  - Essential for applying changes to service
  - Important for successfully running service
  - Desirable for successfully running service

- Circular dependencies: Not excluded by principle, but need to remove avoidable ones, and clearly identify and mark the unavoidable ones

- How to ensure that views remain up-to-date with reality?

# Service View – Service Granularity

- Say Z depends on Y

- What granularity do we need to consider Y at?

- Can probably be sorted only by input from experts of both Z and Y

- We have the service catalogue used e.g. by the service desk – but granularity clearly too coarse

- Proper understanding important for reaching the right conclusions

- How to ensure that views remain up-to-date with reality?

# Threats

- Hardware failures of individual nodes

- Power disruptions at various levels
  - Single-phase or all phases
  - PSU, PDU, room, building, …
    - What is the right classification?

- Data loss due to intrusions
  - Cybercrime, e.g. ransomware
  - Sabotage

- Network disruptions at various levels
  - Router, switches, room, building, …
    - What is the right classification?

- Physical impact: cooling, fire, inundation, …
  - Part / zone of a room, room, building, …
    - What is the right classification?

How to ensure that views remain up-to-date with reality?

# Approach

- All members presented services from their respective groups

- Drilled down in more detail into three services: Indico, Teigi (part of configuration management), DNS

  – Lots of useful insights into which information to collect, and what are potential areas for recommendations

# Status

- Template to describe services ready

- About to contact all services

- WG members will provide help wherever needed


- Regular contact with IT Management and with IT service managers


- Agreement that a one-off is of very limited usefulness
  - Group is prepared to launch an iterative process, say once or twice per year

# … And Then What With the Data?

- Round of services will deliver large volume of data
- Some tool support is indispensable
  - Storing information
  - Making information available
    - E.g. on dependencies: Show me all services that critically depend on service X; find all circular dependencies
  - Cross-checking information with other sources, finding inconsistencies
  - Providing visualisation wherever adequate

# Tool support

- Looked at options
  - Both in terms of free/open-source and commercial solutions
  - Mostly targeted at automatic discovery of dependencies of 'black-box' services

- Currently considering a simple implementation on top of Elasticsearch
  - Data ingress via JSON files – many people know them

# Why Bringing This to HEPiX? (1)

- List of services and their dependencies and, to some extent, business cases are CERN-specific
  - Subsets overlap with other sites anyway

- Threats, dependency classifications etc. are definitely not

- Neither is the need for tool support

# Why Bringing This to HEPiX? (2)

- Some services to be considered are WLCG- (or otherwise community-) wide

- Potential business continuity implementation may include other sites

# Why Bringing This to HEPiX? (3)

- Is your site doing something in similar directions?
  - Is there a potential for collaboration, at least at the level of sharing experience?
- Do you have any experience with or ideas about tools that could help?

- We are all very eager to hear from other sites
  - Ready to consider collaborations

Comments? Questions? Interest?

Contact us now, by mail (see below), or via shared Google document