MultiONE implementation

LHCOPN meeting #53 – IHEP Beijing
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Rationale

The major benefit of LHCONE is the trust in the connected sites: it allows sites to connect the LHCONE fat links directly to their data-centre and bypass low-bandwidth and expensive security inspection at the border of their networks

Due to the inclusions of other collaborations (BelleII, DUNE…), the increasingly growing number of connected sites may reduce the trust

The MultiONE project aims to document the use of the LHCONE network and to improve the trustiness in LHCONE

Implementation

Sites connected to LHCONE have to:
- identify the experiments/collaborations that are using their computing resources made available over LHCONE
- tag each IP prefix announced to LHCONE with the BGP communities* that identify the experiments/collaborations served by the site

The tagging is done by the sites. If a site is unable to do it, they can ask their NREN to do it in their behalf.

Later on, sites can decide to drop prefixes of collaborations they are not working with. This step has not been agreed yet.

* BGP is the routing protocol used in LHCONE; BGP communities are numeric tags that can be added to the network prefixes announced to the BGP peers

Benefits

- BGP communities tagging is a simple and commonly used technique
- Tags are useful to document the use of the network and to double check what is declared in CRIC
- Reduced exposures of sites when filtering is implemented
- Tagging and Filtering can be implemented progressively
- No changes at sites when a new site connects to LHCONE

Limitations

Not 100% secure:

- any sites will still be able to send packets to sites that tag and filter. However TCP connections will not work.

- a malicious sites can tag its prefixes with all the existing tags and get the prefix accepted. This could be mitigated if Network Providers validate the tagging

Beware

Please note that this activity is **not** much related to the packet/flow tagging activity proposed by SciTags

The tagging of the LHCONE prefixes in BGP **can be done independently** from the IPv6 Flowlabel or Fireflies tagging

Documentation

https://twiki.cern.ch/twiki/bin/view/LHCONE/MultiOneBGPcommunities

Community format:
- Standard BGP community
- **Format: 61339:ExpID**
- The ExpIDs are the same as those defined
    by the SciTags initiative

Defined Communities

ALICE	61339:5
ATLAS	61339:2
BelleII	61339:6
CMS	61339:3
DUNE	61339:8
ILC	61339:10
JUNO	61339:12
LHCb	61339:4
NOvA	61339:13
Pierre Auger	61339:11
XENON	61339:14
perfSONAR servers	61339:60001
LHCONE backbone	61339:60002
Demo/Prototype	61339:60003

What your site has to do

- **Identify the experiments/collaborations** served by your facility
- **Tag your IP prefixes announced to LHCONE with the correspondent BGP communities**

E.g.
- Facility CERN-T0 participate to ALICE, ATLAS, CMS, LHCb and DUNE.

- The CERN-T0's prefixes announced to LHCONE must be tagged with the BGP communities 61339:5, 61339:2, 61339:3, 61339:4 and 61339:8

Support

A GGUS ticket campaign has started

If you need any help, please:
- Ask your NREN/LHCONE provider
or
- Ask for support in the ticket

You will find more information and configuration examples here:
https://twiki.cern.ch/twiki/bin/view/LHCONE/MultiOneBGPcommunities

GGUS tickets

SUBJECT: Request to implement BGP tagging of LHCONE prefixes. (UKI-LT2-IC-HEP)
TICKET INFORMATION:
DESCRIPTION:
This ticket concerns **all the sites connected to LHCONE.**

In agreement with the WLCG Management Board, it has been decided to implement the tagging of the IP prefixes
announced to LHCONE.
The task consists of tagging the IP prefixes that your site announces to LHCONE with all the BGP communities that
identifies the experiments and collaborations supported by your site. The initial goal is to document the use
of the network. In the longer term the tags may be used to reduce the exposure on the LHCONE connection, by
filtering unnecessary prefixes.

You will find the values of the BGP communities to use and other information in these pages:
- https://twiki.cern.ch/twiki/bin/view/LHCONE/MultiOneBGPcommunities
https://indico.cern.ch/event/1356138/contributions/6123461/attachments/2925447/5147273/WLCG-20240911-GDB-MultiONE
-implementation.pdf

If you need any support on this task, please don't hesitate to ask your
NREN or LHCONE provider. Or just reply to this ticket asking your questions; experts will guide
you in the implementation.

Please take this opportunity also to review the network information
related to your site in CRIC : https://wlcg-cric.cern.ch/core/networkroute/list/

We ask you to perform the required action **by the end of March 2025**

Status update

Date: 2024-10-04

Number of tagged prefixes: 84
Total number of LHCONE prefixes: 719

Number of ASes originating tagged prefixes: 17

Questions? Comments?

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