multiONE: implementation proposal

LHCONE meeting #50
19 April – Prague CZ
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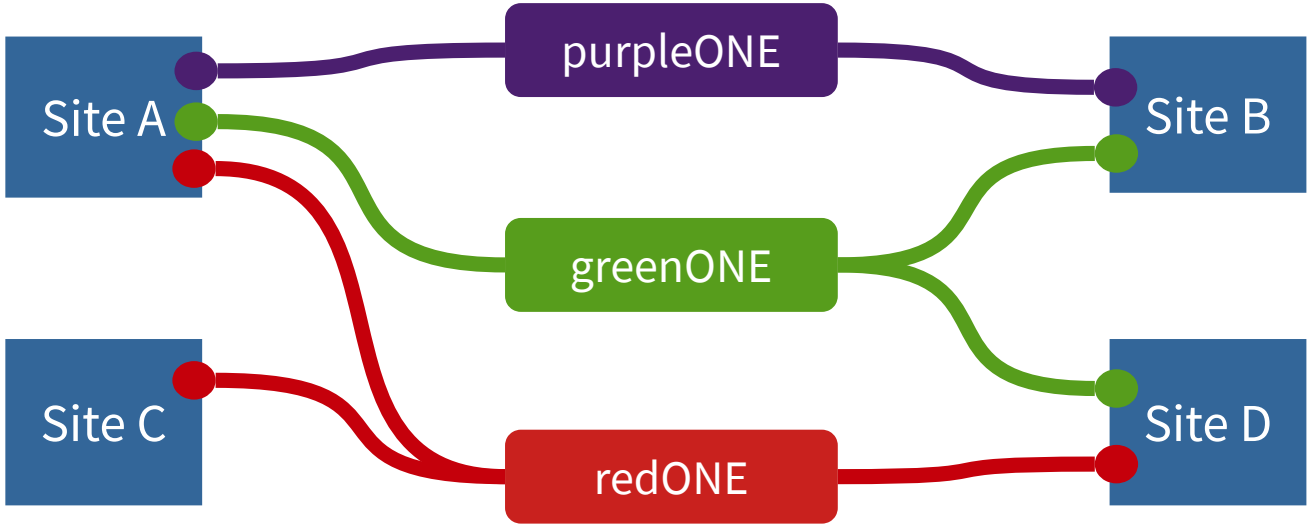
Recap: multiple “LHCONEs”

Each site joins only the VPNs of the groups it is collaborating with (e.g. ATLAS-ONE, CMS-ONE, DUNE-ONE, BelleII-ONE...)

- **Major Benefit**: reduced exposure of data-centre/Science-DMZ to other sites
- **Major Challenge**: how to correctly route traffic into VPNs at sites that join several of them?



What if?

What if we don't worry about correctly routing traffic?

Reduced exposure would be achieved!

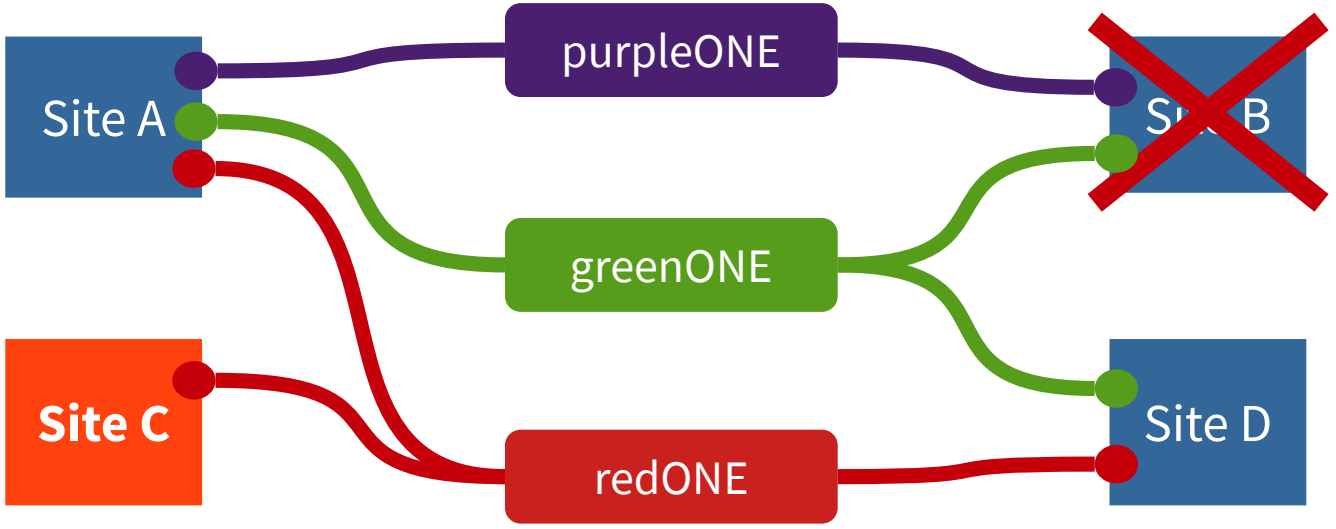
Traffic will go on the first VPN, regardless of the colour. Accounting won't be perfect, but anyway better than today

What would happen?

Single Collaboration sites (e.g. site C):

Only benefits:

- not exposed to Purple and Green sites that are not Red
- traffic correctly routed into redONE at all sites



What would happen?

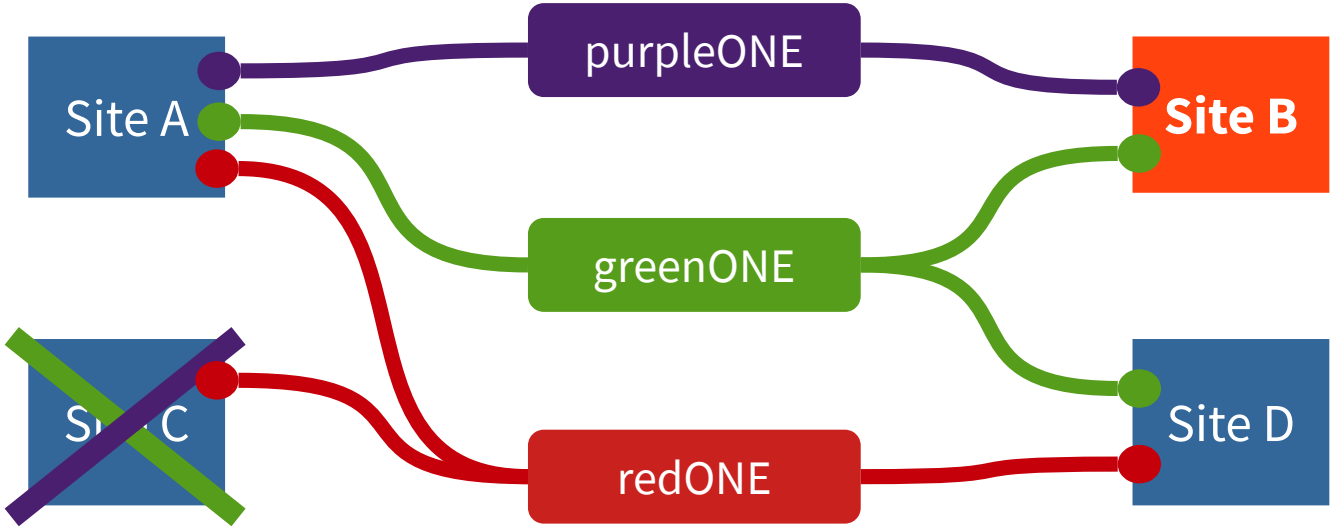
Subset of Collaborations sites (e.g. site B)

Some benefits:

- not exposed to RED-only sites
- traffic to site D correctly routed into greenONE

Drawbacks:

- Traffic to site A will take one of the two VPNs, regardless of the colour



What would happen?

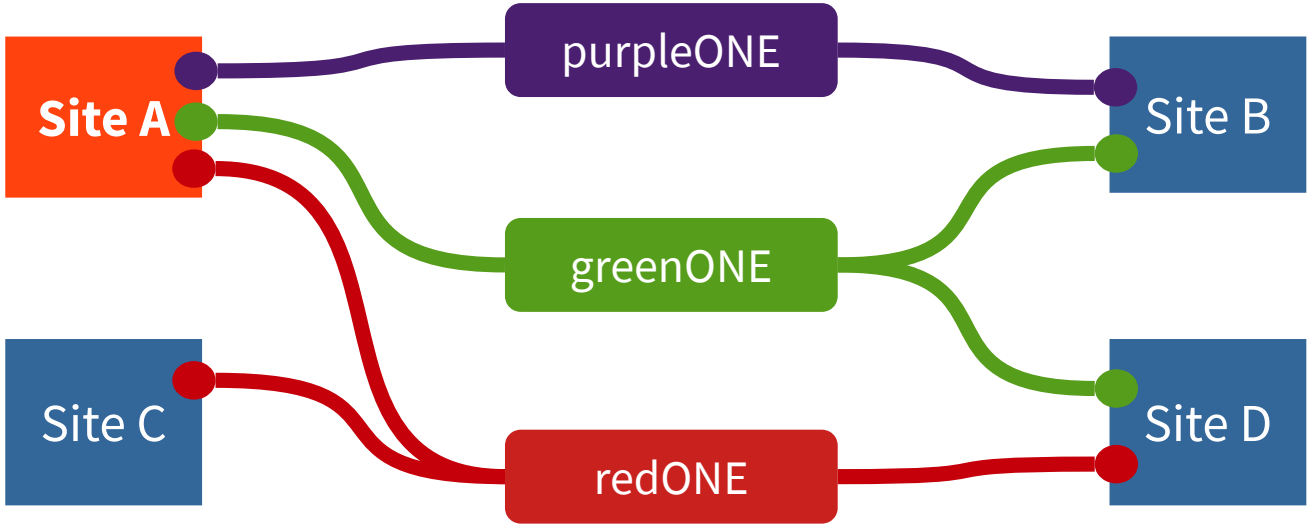
All VPNs sites (e.g. site A):

Reduced benefits:

- only traffic to single-coloured sites will use the correct VPN

Drawbacks:

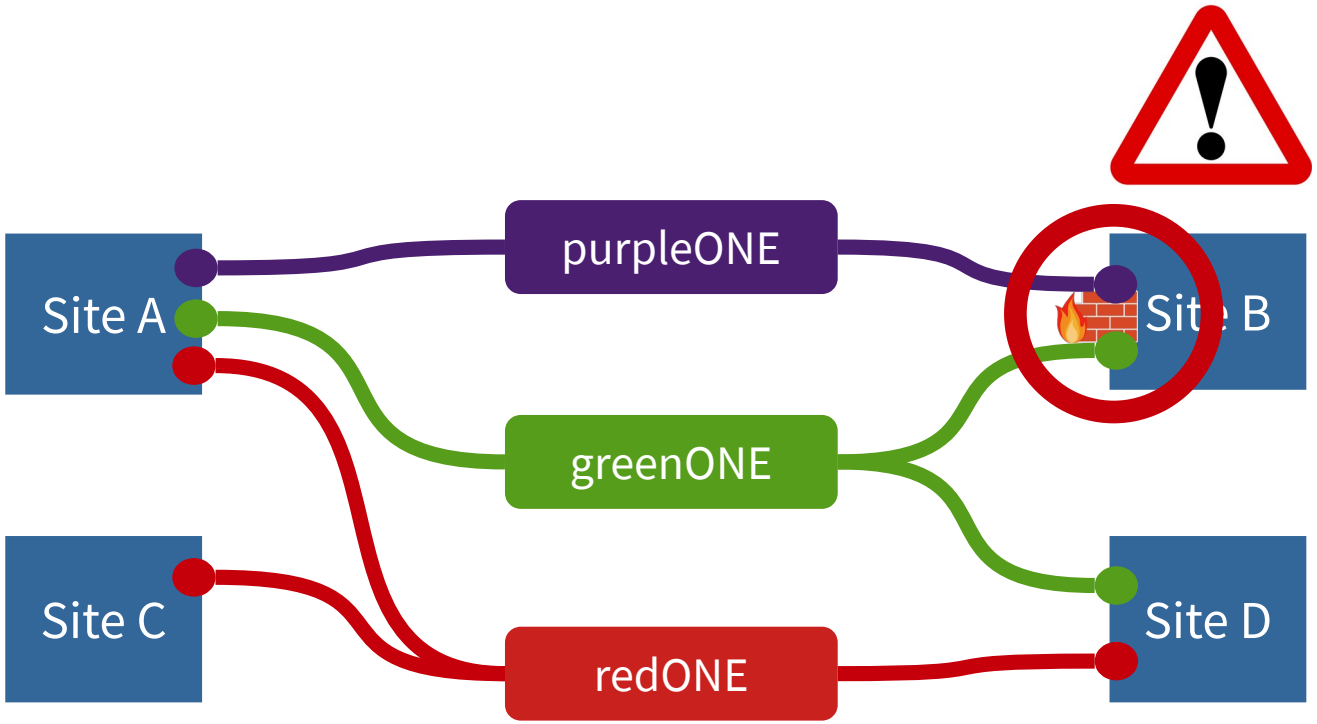
- Traffic to site B and D will always take one VPN, regardless of the colour
- Many BGP peerings (additional configuration complexity)



What could go wrong?

Use of statefull firewalls between VPNs

- Asymmetric traffic is dropped



Proposal

Implement a new VPN for one experiment/collaboration and connect all its sites

- Any volunteer? DUNE? CMS? BelleII? ...

Once completed, disconnect from LHCONE all the sites serving only that experiment

If successful, repeat with other collaboration

Traffic separation with SciTags

CERN IT-CS has been investigating the possibility of making use of the SciTags IPv6 flowlabel tags to implement routing for multiONE, i.e. route the traffic of the different LHC experiments into the appropriate VPN based on the flowlabel tags

A prototype of a flowlabel router has been developed using a P4 programmable switch

A prototype of multiONE has been built using a simulation and the GEANT P4 testbed (more in Carmen's presentation)

When SciTags IPv6 flowlabel tagging is available on production traffic, more accurate MultiONE routing can be achieved

Opinions?

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