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The HEP transition to IPv6

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Description of the work

The requirements for a successful transition to IPv6 on the WLCG production infrastructure are simple to express: namely that the functionality, performance and security of all services must be at least as good as they are today under IPv4.

The HEPiX IPv6 Working Group has been investigating the many issues which feed into the decision on the timetable for a transition to the use of IPv6 in HEP Computing. The activities include the analysis and testing of the readiness for IPv6 and performance of the many different components essential for HEP computing, taking a full systems view of infrastructure and applications. We have been working closely with the HEP experiment collaborations and related IPv6 activities in EGI. The working group is also considering other operational issues such as the implications for security arising from a move to IPv6.

A survey of all important applications and operational tools is well underway. This is restricted to an analysis of the IPv6 readiness of the important WLCG outward-facing services and essential applications and operational tools. In addition to this survey we have already deployed a distributed IPv6 testbed connected to the national research networks that have been providing production IPv6 routing for a few years. We have been testing various Grid services to determine their behaviour in a dual stack environment. During the rest of 2012 we will need to perform larger-scale tests of the functionality, performance, and security of many different components of WLCG.

Wider impact of this work

The decision as to when to support dual stack, IPv6 and IPv4, services needs to take the needs of many stakeholders into account. This will have a major impact on operations, including networking support and the security team, and careful testing and planning is required. For the WLCG community we will also need to involve other Infrastructures such as Open Science Grid in the USA.

Printable Summary

Moving distributed applications to IPv6 involves much more than the routing, naming and addressing solutions provided by the campuses and national networks. Application communities need to perform a full analysis of their applications, middleware and operational tools to determine whether they are IPv6-compliant and establish how much development work is required to update those which are non-compliant. The HEPiX IPv6 Working Group has been investigating the many issues which feed into the decision on the timetable for the transition to IPv6 and has deployed a distributed IPv6 testbed. This paper presents the work being done by the group in collaboration with WLCG and IPv6 activities in EGI.

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