

Multicast Streaming on Dynamic Networks

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SHORT USE CASE DESCRIPTION

Multicast is becoming a ubiquitous technology however it still remains a challenge to deploy in some commercial networks. With offerings like IPTV becoming predominant Internet content it is required to see the impacts of multicast traffic on the network when having high latency environments such as international networks. However, configuring multicast capable networks across all these management domains and having the layer 1 connectivity on-demand, can be and lengthy process. That is the experimental international dynamic network called HPDMnet[1] is being used in this experiment. Using this facility provides all the required substrate to do these low level multicast capable networks on-demand.

A. Technical environment

Figure 1 displays the infrastructure used to run this use case scenario. The equipment used is as follows:

- A dynamic network
- A dedicated server running Panlab Testbed Manager.
- A streaming server
- Two Desktop clients
- Network Switches interconnecting the nodes.

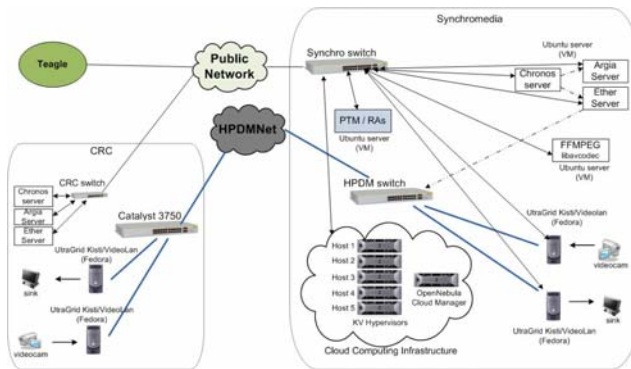


Figure 1: The Testbed Infrastructure

Only part of the infrastructure is being used by this use case, the main components are the link to the HPDMnet dynamic

network and the servers as well as the desktops involved in the VideoLan multicast streaming. As seen on Figure 2, the resources adapters for the Canada PTM and the Teagle tool is used to create the orchestration shown on Figure 3. The HPDMnet facility is controlled via a Network Resource Manager called Chronos with is an advanced reservation system on top of the Argia middleware. The resource Adapter uses Webservice calls to Chronos to establish the layer 1 and layer 2 connections across the HPDMnet participating sites.

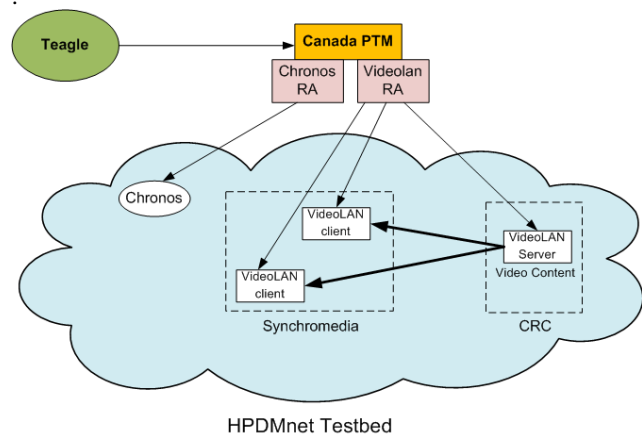


Figure 2: Logical Use Case Description

The VideoLan application is controlled via remote SSH connections controlled by the resource adapter.

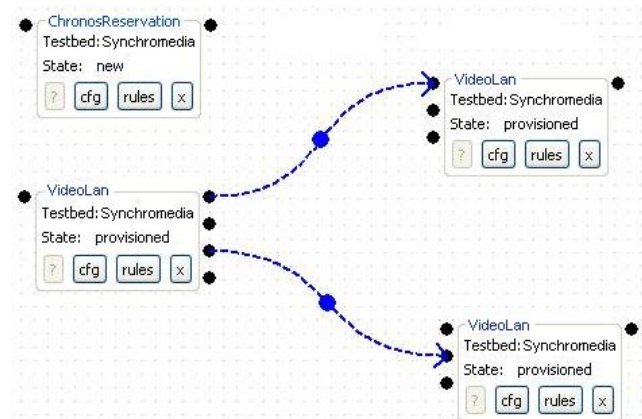


Figure 3: Resource Orchestration

B. Results

Initial setup and results for this use case only had two HPDMnet sites, mainly Synchromedia at ETS and Communications Research Centre (CRC) in Ottawa, this limited experiment, showed that it is possible to create on the fly a stream between these sites. A high quality HD video was streamed over 1Gbps dedicated links established between the two sites.

TEST BED AVAILABILITY

The resources for creating similar scenarios are going to be available under the Panlab Office offerings. However, because

of its dependency on HPDMnet only nodes connected to this private internal facility will have the ability to execute these use cases. The plan is to provide to some level integration between the Panlab Facility and the HPDMnet experimental testbed allowing Panlab users to run these scenarios even if they don't have such local facilities.

^[1] OpenNebula, <http://www.opennebula.org>

^[2] HPDMnet, <http://www.hpdmnet.net>