

**OpenDRAC is a Network Resource Manager created by Ciena in collaboration with SURFnet. Its goal is to provide Bandwidth-on-Demand to end users upon request. Since December 2008, it is being used in SURFnet6, the Dutch National Research & Education Network, as a building block of SURFnet's Dynamic Light-path (BoD) service. Since April 2010 OpenDRAC is available as open source software.**

Bandwidth-on-Demand services offer network users a dedicated amount of bandwidth from one place to another for a specific amount of time, that a user can schedule or request instantly. These services rely on Network Resource Managers (NRMs), software inside the network that handles requests for bandwidth and controls the network equipment - each network domain can have its own NRM. Incoming requests for bandwidth are evaluated by calculating possible paths through the network for the requested time period and are stored in the reservation database. Upon start time of the reservation the NRM provisions the network element to setup the path. In case multiple domains are involved in an end-to-end (e2e) path, the various NRMs must be capable of performing inter domain communication. To date, several options exist in inter domain protocols.

In order to cope with inter-domain BoD reservations, OpenDRAC participated in the Automated GOLE pilot to demonstrate its inter-domain capabilities in October 2010. This demonstration successfully showed multiple GLIF Open Lightpath Exchanges (GOLEs) creating inter-domain lightpaths dynamically. As of today, OpenDRAC configures Ciena OME6500 (SONET/SDH) and Force10 (Ethernet) equipment. OpenDRAC can be either invoked via a web GUI or via Web Services; for these web services is an example application is available.

In the near future, OpenDRAC will offer support for additional network equipment, and all inter-domain developments will be followed closely. Further on the road, OpenDRAC's ability of scheduling more than networking resources will be developed.

