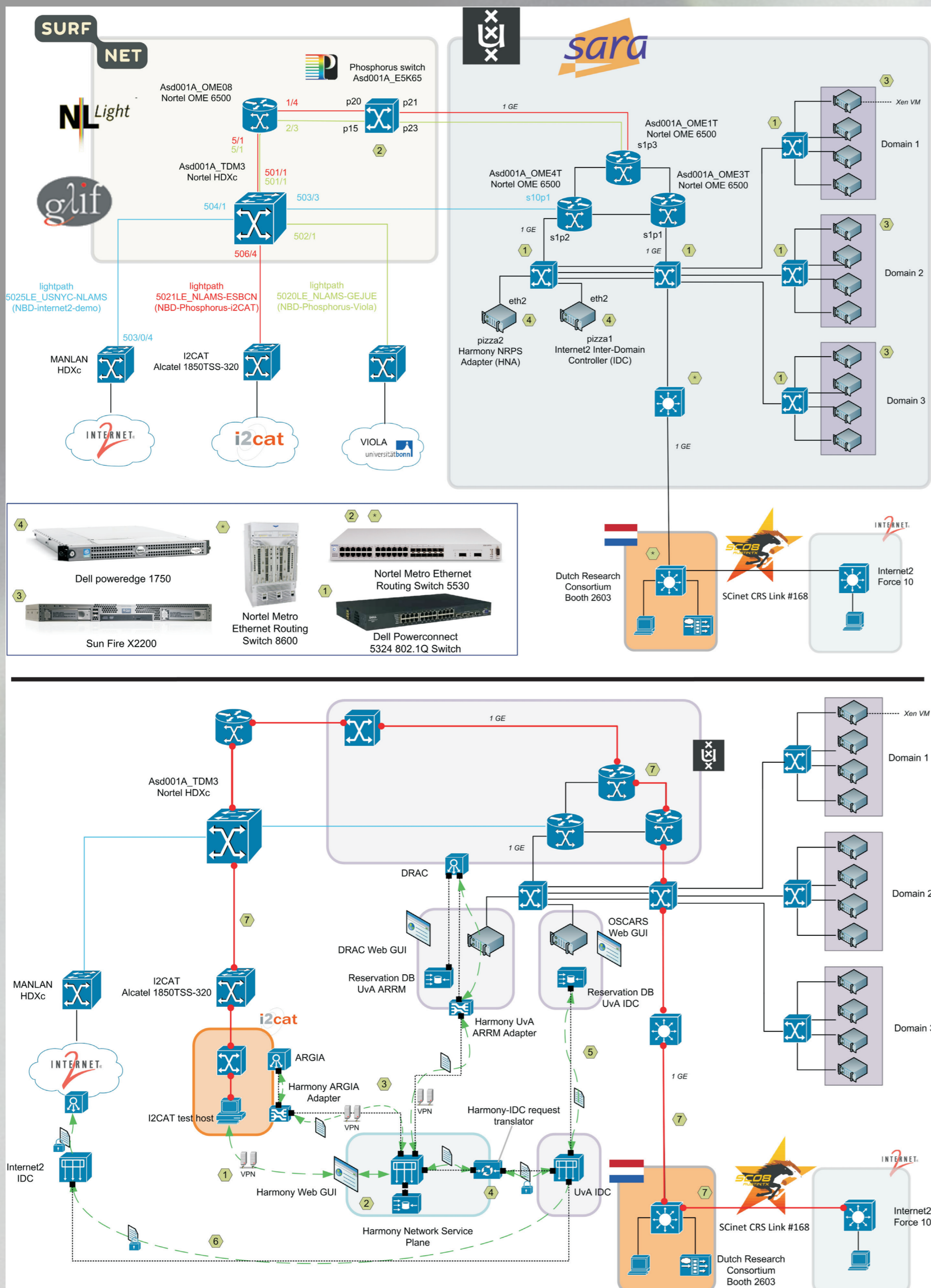


Phosphorous - DCN interoperability

Towards a Uniform Network Service-Plane Specification



The combined Phosphorous/DCN service - and control plane, request messaging and path provisioning of the SC08 demo setup. The green arrows depict the flow of availability and reservation request messaging over the control channels (the black dotted lines). The red lines depict the data connections that are set up in an I2CAT-Internet2/SC08-showfloor demo scenario.

1. A user requests a path reservation from the Harmony NSP using the Web GUI.
2. A check on the availability of the requested service is made.
3. A createReservation message is sent to the domain controllers involved in the requested path, in this case ARGIA and DRAC. The reservation is stored in the respective databases.
4. The createReservation message is translated by the request translator. This process involves the mapping of elements present in the request to elements required in an IDC createReservation request. Translating elements such as start-time, end-time and bandwidth are straightforward; the most significant deviation in the requests and request elements between the Harmony NSP and the IDC concern security and AAA.
5. The IDC request is processed and the reservation is stored in the UvA IDC database.
6. In scenario's in which the path ends in the Internet2 domain, the UvA IDC relays the request to the Internet2 IDC where the request is subsequently processed.

7. At usage time the path is set up. Currently path setup signalling is not implemented yet, so all reservations have to be made with the automatic activation feature enabled.

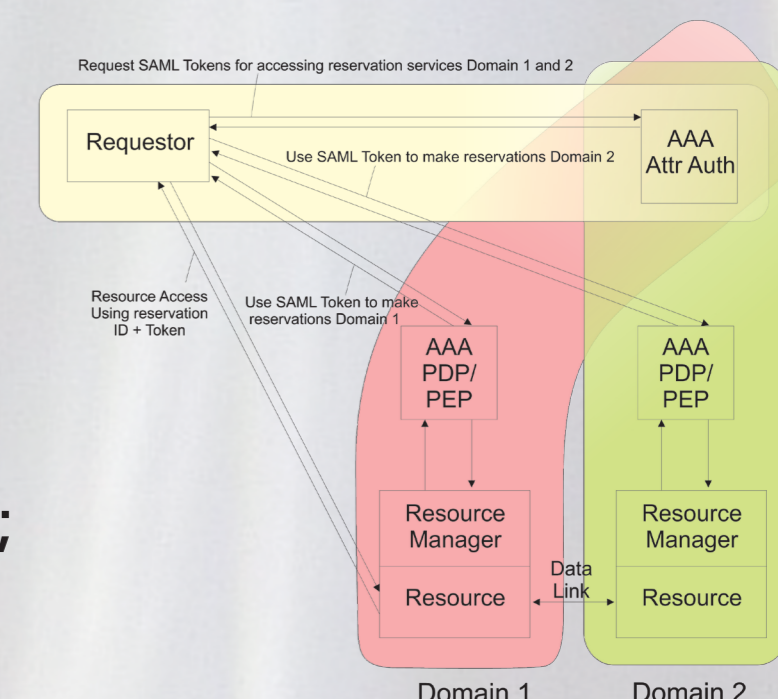
In Multi-Domain Network Resource Provisioning

(NRP) a distinction between the NRP Control-Plane (CP) and the NRP Service-Plane (SP) is often made. CPs differ per domain because different domains have different network infrastructures that need to be controlled in network equipment vendor specific ways. SPs, however, all share the purpose of securely requesting, processing, storing and activating reservations for paths and bandwidth. Thus, whereas CPs are usually necessarily different, SPs are not. SPs differ because there is no (standard) specification of their functionality and interface.

The purpose of the Phosphorous NRP Harmony, is to unify access to the CPs of the networks of the Phosphorous partners, e.g., ARGIA and DRAC, in order to request and set up paths through the combined Phosphorous network. In the Phosphorous/DCN interoperability setup, Harmony interfaces with DCN's Inter-Domain Controller (IDC) that is a part of their NRP architecture: Dynamic Circuit Networking (DCN). DCN shares its purpose and key architectural principle with Harmony: both Harmony and DCN are inter-domain control architectures and both have an adaptation layer between the IDC's and the domain controllers.

The motivation for the Phosphorous/DCN interoperability

setup is that it provides a platform for evaluating SP functionality and interfaces in an exploratory way. Currently, the GLIF and OGF communities are undertaking initiatives to specify and standardize the interfaces and functionality; the Network Service Interface (NSI). The Phosphorous/DCN interoperability setup and demo should be seen as an effort towards the specification of a standard NSI and NRP functionality.



Operation	Harmony NSP	DCN IDC	Request Translator
Create Reservation	✓	✓	✓
Cancel Reservation	✓	✓	✓
queryReservation (IDC)	✓	✓	✓
get Status (NSP)			
isAvailable (NSP)	✓	✓	
modify Reservation	✓	✓	
list Reservation (IDC)	✓	✓	✓
get Reservations (NSP)			
create Path (IDC) activate (NSP)	✓	✓	
refresh Path		✓	
tear Down Path		✓	

The DCN IDC is designed by a collaboration of ESnet, Internet2 and GEANT, and is deployed by these networks and others. The ESnet and Internet2 implementations are based on the OSCARS program developed and maintained in common, and GEANT version is developed and supported in the AutoBAHN network.



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