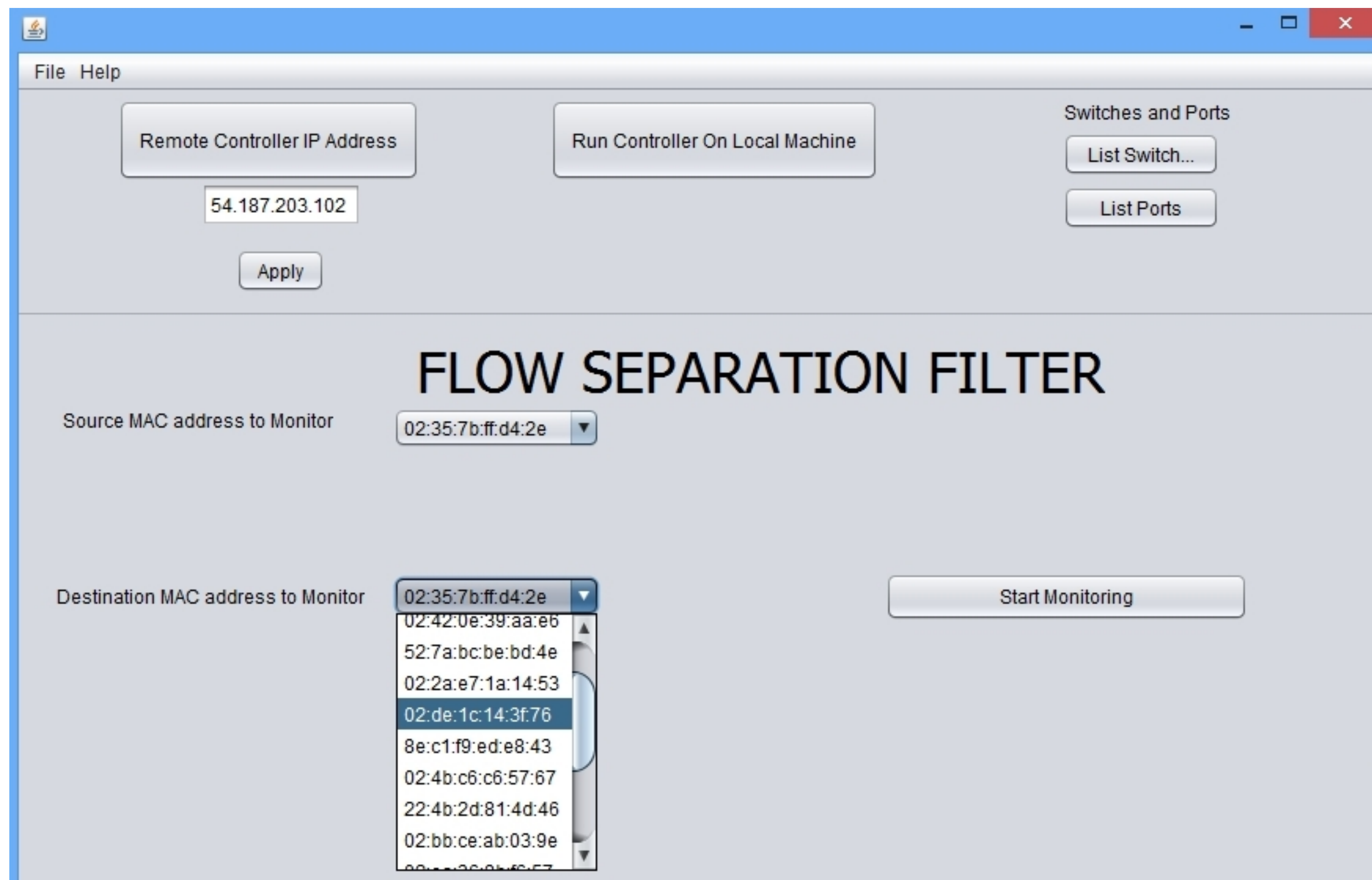


Separate flows at aggregation points to direct into end services for monitoring

Similar to the familiar WIRESHARK functionality

Entry of any filter parameter by the network engineer

Network Debugger App



- Aggregate switch has combined traffic going to the edge production switch.
- Network debugging tool performs flow separation at the aggregation switch to monitor only desired traffic without affecting production traffic.
- All datapath elements in VTS reservation are programmable by our controller.

1. Circuit request for topology

```
<rspec type="request"
  xmlns="http://www.geni.net/resources/rspec/3"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:sdn="http://geni.bssoftworks.com/rspec/ext/sdn/request/1"
  xmlns:vts="http://geni.bssoftworks.com/rspec/ext/vts/request/1">
  <vts:datapath client_id="dp0" image="bss:ovs-201">
  <vts:port client_id="dp0:p0"/>
  <vts:port client_id="dp0:p1" target="dp1:p0"/>
  </vts:datapath>
  ...
```

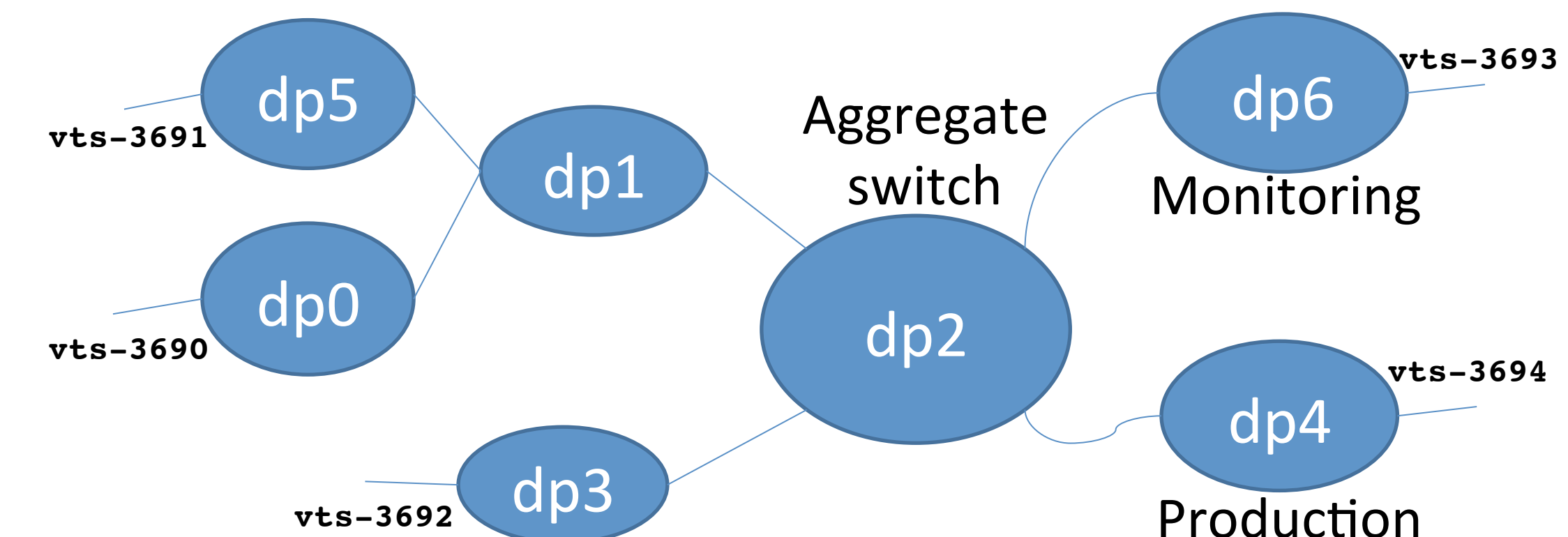
2. VTS circuits

```
<rspec ... type="manifest">
  <vts:datapath clientid="dp0" image="bss:ovs-201">
  <vts:port client_id="dp0:p0" shared_vlan="vts-3697"/>
  <vts:port client_id="dp0:p1" target="dp1:p0"/>
  </vts:datapath>
  <vts:datapath clientid="dp1" image="bss:ovs-201">
  <vts:port client_id="dp1:p0" target="dp0:p1"/>
  <vts:port client_id="dp1:p1" target="dp2:p0"/>
  <vts:port client_id="dp1:p2" target="dp5:p1"/>
  </vts:datapath>
  ...
  <sdn:controller url="tcp:54.187.203.102:6633"/>
</rspec>
```

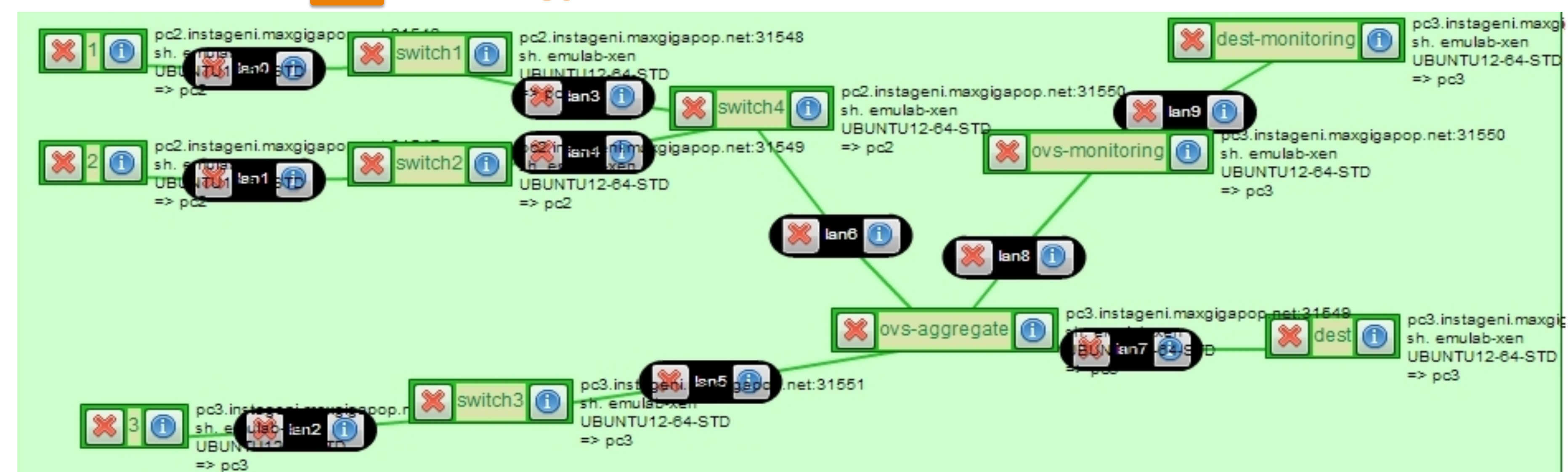
3. VMs connected to circuits

```
<node client_id="xen1" exclusive="false">
  <sliver_type name="emulab-xen">
  <ns0:xen xmlns:ns0="http://www.protogeni.net/resou...
  </sliver_type>
  <interface client_id="xen1:if0" component_id="eth1"/>
</node>
<link client_id="link-1">
  <interface_ref client_id="xen1:if0"/>
  <sharedvlan:link_shared_vlan name="vts-3690"/>
</link>
```

1 Topology on GENI: VTS Option



2 Topology on GENI: OVS on a VM Option



Without VTS

No of VM's: 11
Setup overhead: 6 OVS nodes (flack or rspec), configure bridge i/f @ each OVS

Using VTS

No of VM's: 5
Setup overhead: 2 rspecs (topology + VMs omni)