Dell Active Fabric Controller

Transform and modernize IT with a network designed for the cloud

Dell Active Fabric Controller offers an integrated solution to provide on-demand virtualized network services to OpenStack with fully automated, complete lifecycle management of the physical infrastructure. Unlike traditional network architectures limited by protocol support, rigid topology requirements and blocked links, Active Fabric Controller uses software defined networking to eliminate the need for legacy protocols.

Active Fabric Controller enables switches within a private cloud infrastructure to be inter-connected in any way, automatically detecting the topology and optimizing for the shortest path connections and load balancing. This enables all access switches to connect directly to each other, enabling a flat, single-tier fabric with no blocked links and no spanning tree protocol, delivering the ultimate in simplified east-west traffic performance. Administrators can quickly and easily tailor the fabric to the needs of applications. If additional bandwidth is needed, simply plug in additional links — the topology is optimized and the capacity is added.

Deliver customized policy that dynamically provisions and scales with workloads

Active Fabric Controller radically streamlines application connectivity policy by delivering on-demand virtual switching fabrics that can be created and provisioned along with the virtual machine settings in OpenStack. Active Fabric Controller offers multiple levels of multi-tenancy and network slicing features to deliver carrier-grade isolation keeping workloads secure. Unlike legacy approaches, Active Fabric Controller dynamically provisions networks to be virtualized and customized to the connectivity requirements of the application. The fabric knows which virtual machines are operational, and moves the network connection of each workload along with the application without the need for manual intervention.

Experience ultimate efficiency with elastic, auto-adapting fabric services

Active Fabric Controller offers simple, integrated high-availability clustering with support for hitless in-service software upgrades. Advanced features such as flow-level traffic steering are used to gracefully steer traffic around devices in need of maintenance to enable changes, upgrades or troubleshooting without disruption to applications or users.

And with automated device and link discovery with topology optimization, adjusting the fabric to application needs is simple. Simply add or remove any links or switches, tailoring the fabric to empower superior performance, density and efficiency at any point in the process.

Active Fabric Controller delivers powerful customizable policies, new enforcement methods and deep programmability never before possible in traditional networking solutions. These advanced features are configured through a single, simple graphical interface to give cloud administrators visibility and control over application behavior and performance.

For monitoring and troubleshooting, Active Fabric Controller offers significant advantages over traditional deployments. Active Fabric Controller provides centralized logic for all fabric switches, providing a real-time fabric-wide view of the network for administrators and delivering advanced, programmable fabric services to applications. This centralized view provides more intelligent and actionable analytics than traditional switches, simplifying every aspect of operation to deliver next-generation visibility and control.

Make a clean break from legacy with a transformative, Plug-n-Play solution optimized for cloud and application administration.
Key features

- **Controller resiliency/scalability**
  - High availability clustering with in-service-software-upgrade and non-stop forwarding

- **Management**
  - GUI
    - Dashboard
    - Topology discovery
    - Logging
    - Flow monitoring
    - Flow mirroring

- **REST-based northbound API**

- **Dell Neutron (Quantum) plug-in**

- **Dell OpenFlow extensions**
  - Use of L2 forwarding table to support >128k Flows
  - HW flooding
  - Dynamic LAG configuration

- **SDN applications**
  - Auto topology discovery
  - Loop prevention
  - Shortest path computation
  - Multi-path connectivity and dynamic load distribution
  - Logical networks (L2)
  - Multi-tenancy (L2)
  - Network policy enforcement
  - Endpoint policy enforcement
  - Service/Middle-box insertion
  - Service Class

- **System requirements**
  - Each server can be a virtual machine (VM) or a physical machine. Requirements:
    - CPU: 2.4GHz, Intel Xeon CPU or equivalent (for optimal performance, Dell Networking recommends a four-core minimum)
    - Memory: 8GB
    - Disk space: 30GB
    - Network Interface: 1x1 GbE
    - CentOS 6.4, 64-bit (for RPM installation)
    - ESX 4.x or 5.x server (for OVF installation)
    - MongoDB
    - LLDP enabled on all hosts and servers
  - User authentication
    - RADIUS
    - TACACS+

- **Active Fabric Controller supports these Dell Networking switches**
  - S4810
  - S4820T
  - S6000
  - MXL
    - Input/Output Aggregator (IOA)

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Traditional networking (Layer 2/3) vs Dell Active Fabric Controller

<table>
<thead>
<tr>
<th>Character</th>
<th>Traditional networking (Layer 2/3)</th>
<th>Dell Fabric Controller</th>
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</thead>
<tbody>
<tr>
<td><strong>Topology</strong></td>
<td>Limited topology options: STP blocks links or multi-chassis (2-node) like topology to use all links</td>
<td>Completely flexible set of topologies with all links in use, such as ring, spine-leaf and n-way multi-chassis.</td>
</tr>
<tr>
<td><strong>Configuration/provisioning</strong></td>
<td>Per-device configuration</td>
<td>Highly automated auto discovery and configuration and implemented from a central place.</td>
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<tr>
<td></td>
<td>Per-port configuration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Top-down and fixed</td>
<td></td>
</tr>
<tr>
<td><strong>Policy</strong></td>
<td>Per-device policy</td>
<td>Fabric-wide big picture policy admin</td>
</tr>
<tr>
<td><strong>Application/cloud orchestration integration</strong></td>
<td>Per-device</td>
<td>Per controller for applications like traffic analytics, flow steering/monitoring</td>
</tr>
<tr>
<td><strong>Network slicing/virtualization</strong></td>
<td>Done in distributed hop-by-hop fashion</td>
<td>Centralized architecture</td>
</tr>
<tr>
<td><strong>Network administration</strong></td>
<td>Tried and tested</td>
<td>Focused on reducing OPEX</td>
</tr>
<tr>
<td><strong>Control plane upgrade</strong></td>
<td>Must be done off-line or through features like In-System Software Updates (ISSU)</td>
<td>Controller supports in-system upgrades while switches continue to operate</td>
</tr>
<tr>
<td><strong>Control plane OS</strong></td>
<td>Proprietary and limited to switch releases</td>
<td>Industry-standard Linux-based OS</td>
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