SCALABLE DELL EMC ISILON STORAGE SOLUTIONS WITH DELL EMC OPEN NETWORK FABRICS

Building a Data Center network in the industry verticals like Media & Entertainment or Industry Horizontals like big data with best-in-breed solutions that can scale for today's workloads and can easily scale up for tomorrow's increased demands? Dell EMC's Open Networking Switching Fabrics and Dell EMC's Isilon's scale-out storage can offer you the right solution.

The aggressive growth of social media and other industrial data demands high performance access, delivery, and response time to remain competitive in today's business marketplace.

Dell EMC Open Networking Switching Fabrics and Dell EMC Isilon NAS are driving products and solutions by offering a well-engineered storage domain that can deliver both operational and infrastructure efficiencies that were previously unavailable. Scalable and seamless access, reliability, simple management, and performance provide an operational advantage to end users and administrators, while better utilization of existing infrastructure reduces costs. The proper choice of a back-end storage and delivery network is an essential part of the right big data solution.

On Demand Scalability

To remain competitive, the modern data center requires the capability to dynamically grow and shrink based on business requirements. While idle and unused resources lead to wasted expenses, overused and saturated resources lead to performance degradation and even service outages. Together, Dell EMC Open Networking Switching Fabrics and Dell EMC Isilon NAS provide an intelligent and capable architecture that can scale on demand to increase the efficiency of the data center.

A scalable data center network must be able to provide for increased storage traffic or new devices without impacting current systems. Dell EMC Open Networking Switching Fabrics address this challenge by providing the following to customers:
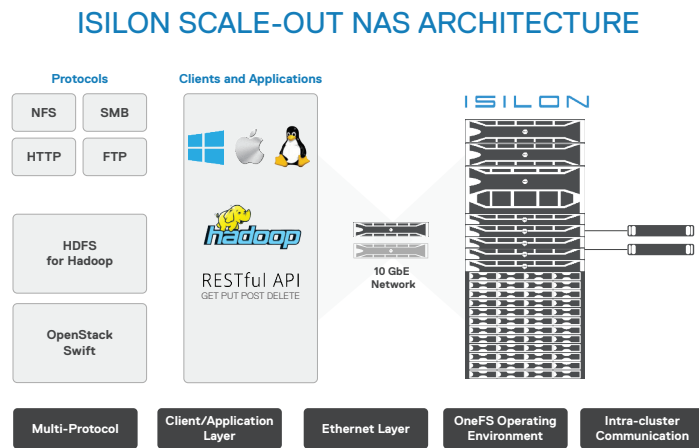
- A portfolio of high-density, line rate, switching platforms with a consistent operating model across platforms.

- The ability to manage multiple devices as a single system without reduced functionality using Dell EMC's OS10 SmartFabric services and Fabric Design Center

- The ability to construct high-performance multi-system topologies without reducing the capacities of each system or introducing blocking architectures.

- The ability to linearly scale to a larger number of high-performance interfaces that map cleanly to a server's ability to generate I/O and a storage system's ability to consume/source data.

A scalable network needs a scalable storage solution to achieve true Big Data performance. Dell EMC Isilon NAS scale-out storage provides many important advantages in this regard:

- Massive scalability: Dell EMC Isilon network area storage can easily scale to over 85 petabytes in capacity with a highly efficient, easy-to-manage, single file system/single volume storage solution.

- Storage efficiency: With Isilon storage systems, organizations can achieve an industry-leading 80% utilization with a single pool of storage, thus making Big Data a reality.

Unstructured data storage made simple with Isilon

Dell EMC Isilon scale-out storage solutions are designed for enterprises that want to manage their data, not their storage. Our storage systems are powerful yet simple to install, manage, and scale to virtually any size. Isilon storage includes a choice of all-flash, hybrid or archive nodes to meet the most demanding needs. And, unlike traditional enterprise storage, Isilon solutions stay simple no matter how much storage capacity is added, how much performance is required, or how business needs change in the future. We're challenging enterprises to think differently about their storage, because when they do, they'll recognize there's a better, simpler way—with Isilon.

ISILON SCALE-OUT NAS ARCHITECTURE

Benefits of Isilon storage

- Simple NAS storage environment designed for ease of use
- Massive scalability of capacity and performance
- Unmatched efficiency to reduce costs
- Choice of All-Flash, Hybrid or Archive nodes

- Automated tiered storage to optimize resources
- Multiprotocol support to maximize operational flexibility
- Resilient data protection for a highly available environment
- Robust security and compliance

Spend less, deliver more

Modular and scalable storage like Dell EMC Isilon allows project-based provisioning— you buy what you need when you need it, instead of attempting to forecast—or worse, buy for—future storage requirements. There's no need to overprovision storage or have creative teams sitting idle when business grows beyond projections. Hundreds of terabytes or even petabytes of storage can be added within hours, with no downtime and no business disruption.

Isilon is simple to install, manage, and scale, greatly reducing operating expenses. Unlike traditional enterprise storage, Dell EMC storage stays simple no matter how much storage is added, how much performance is required, or how business needs change in the future. You can add performance and capacity with the push of a button, and adapt to dynamic workflows quickly and easilyB
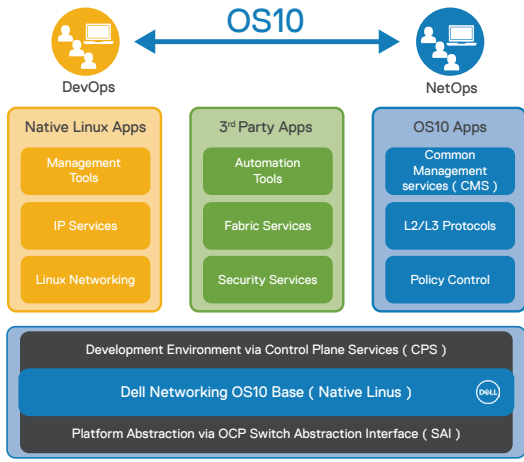
Features and Functionality of Isilon

- Simplifies management with a single-volume architecture
- Reduce data center footprint and related costs with high density and efficient 80% usable capacity costs
- Supports policy based automated tiering and option to tier cold and frozen data to cloud storage providers
- Automated tiered storage to optimize resources Provides flexible, multiprotocol support for unstructured data workloads
- Safeguards data with robust data protection and security options
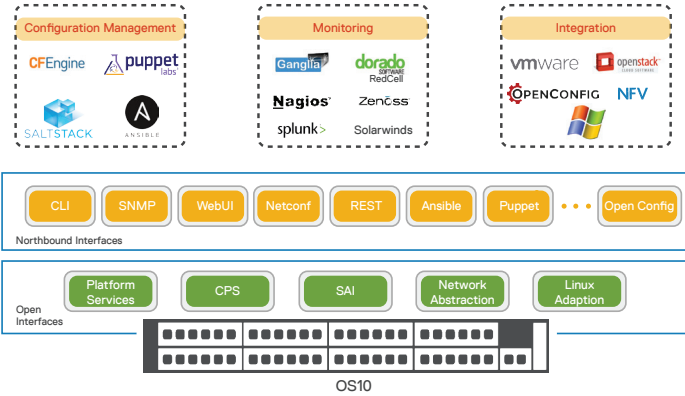
Increased Availability at scale

Robust and redundant networks and storage are an absolute necessity for today's data center. A single failure should not cause a full-service interruption. This high level of availability must extend from the storage medium to the end user. The combination of Dell EMC's Open Networking portfolio and Dell EMC Isilon's storage solutions provides the requisite HA features and self-healing capabilities to mitigate and alleviate faults that could interrupt business operations.

At the heart of all Dell EMC Open Networking is the Dell EMC Operating System OS10. OS10 is a platform-independent modular OS capable of providing embedded automation framework for enabling technology and customization.

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OS10

DevOps ← → NetOps

Native Linux Apps
- Management Tools
- IP Services
- Linux Networking

3rd Party Apps
- Automation Tools
- Fabric Services
- Security Services

OS10 Apps
- Common Management services (CMS)
- L2/L3 Protocols
- Policy Control

Development Environment via Control Plane Services (CPS)

Dell Networking OS10 Base (Native Linus)

Platform Abstraction via OCP Switch Abstraction Interface (SAI)

OS10 Embedded Automation Framework

Enabling technology and partners

Configuration Management: CFEngine, puppet labs, SALTSTACK, ANSIBLE

Monitoring: Ganglia, dorado RedCell, Nagios, Zenoss, splunk>, Solarwinds

Integration: vmware, openstack, OPENCONFIG, NFV

Northbound Interfaces: CLI | SNMP | WebUI | Netconf | REST | Ansible | Puppet | • • • | Open Config

Open Interfaces: Platform Services | CPS | SAI | Network Abstraction | Linux Adaption
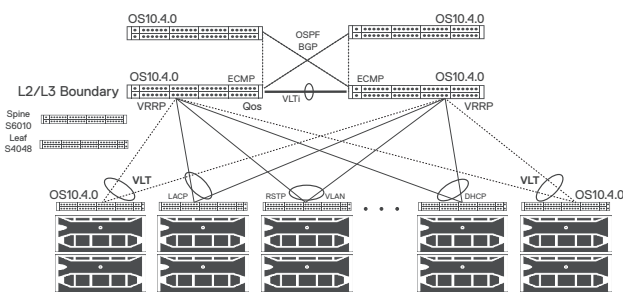
OS10

OS10 also offers powerful industry-standard switching and routing functionalities, including layer 2 Virtual Link Trunking (VLT) and IP Equal Cost Multipathing (ECMP) to increase application availability and performance.

Both VLT and ECMP technologies provide better link utilization, along with transparent HA. VLT delivers up to 16 distribution Link Aggregation (LAG) ports per single bonded interface, while ECMP can support up to 32 distributed route paths to storage systems. The scalable multi-path layer 2/3 bonding features offer active/active
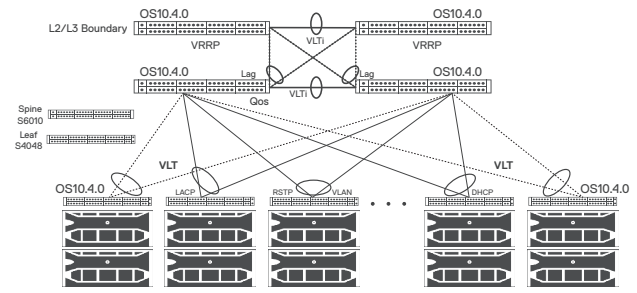
bonded ports that provide increased cross-sectional bandwidth and redundancy with fast fail-over, should a fault occur.

The High Availability path is completed by Dell EMC Isilon's Scale-out NAS storage, which has been designed to withstand multiple simultaneous component failures while still providing unfettered access to the entire file system and data-set. In addition, Dell EMC Isilon data storage solutions leverage built-in enterprise data protection to provide the highest levels of reliability, availability, and serviceability in the industry. Isilon storage systems include
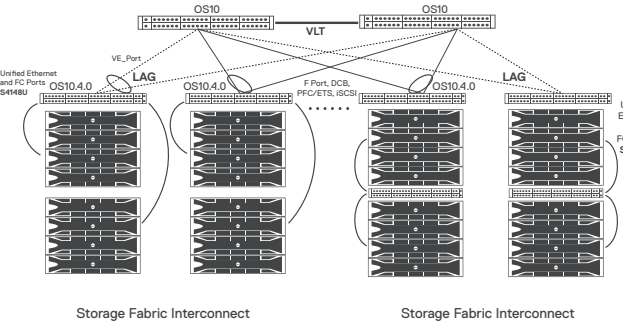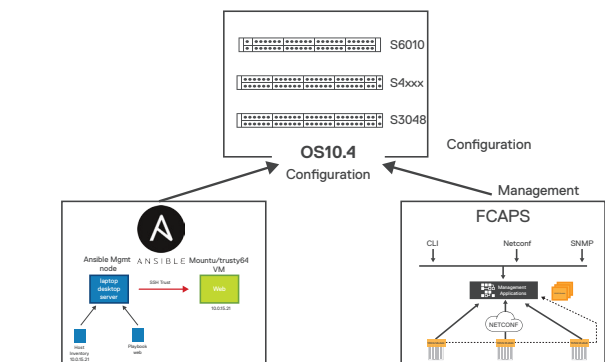
A **L2 and L3 Mixed Datacenter Fabric**

B **Fault-tolerant flat L2 Two-Tier VLT Fabric**

C **Storage Fabric Interconnect**

Storage Fabric Interconnect   Storage Fabric Interconnect
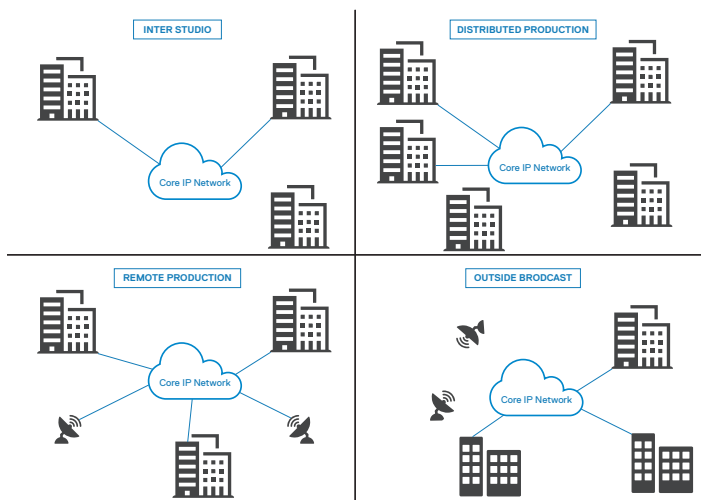
D **Management and Orchestration**

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dependable and efficient snapshot data protection with Dell EMC Isilon SnapshotIQ provides data replication of large, mission-critical data sets to multiple shared storage systems at multiple sites.

Performance and throughput

Performance and throughput are at the heart of your solution. Increased performance enhances competitiveness, and high efficiency ensures the maximum utilization of important infrastructure. Dell EMC Open Networking Fabric platforms provides low latency for Layer 2 and 3 switching. Dell EMC's Open Networking switching portfolio delivers the best bandwidth and performance in the industry. VLT provides benefits over legacy Layer 2 protocols by enabling better use of cross-functional bandwidth and faster fail-over times, while remaining transparent to both the user and the application.

INTER STUDIO
Core IP Network

DISTRIBUTED PRODUCTION
Core IP Network

REMOTE PRODUCTION
Core IP Network

OUTSIDE BRODCAST
Core IP Network

In terms of storage efficiency, Dell EMC Isilon storage systems have been shown to achieve an industry-leading 80 percent utilization with a single pool of storage. Combined with a simple, easy-to-manage approach, this utilization rate helps enterprises to reduce capital expenditures as well as ongoing operating costs. In addition, with Isilon SmartPools software, organizations can optimize resources with an automated tiered storage strategy that provides them with the right combination of performance and economy.

Efficiency also extends to a single, system-wide management and configuration capability offered by both Dell EMC Open Networking Fabrics and Dell EMC Isilon. Combining the efficiencies of Dell EMC Open Networking Fabrics and Dell EMC Isilon creates a best-in-breed solution for both Horizontal and Verticals in the industry

Dell EMC Open Networking Partners

The following list of Dell EMC Open Networking partners solutions that provides you with your choice of Operating Systems, Virtualization and monitoring software by enabling business agility and avoid vendor lock-in.

- **Cumulus Linux OS:** Simplify network management, orchestration and automation, and leverage a broad ecosystem of Linux applications.

- **Big Switch Networks Switch Light™ OS:** Enable a range of SDN-controller-based fabric solutions, and help reduce cost and complexity.

- **Big Switch Networks Big Monitoring Fabric:** Tap traffic everywhere in the network for exceptional visibility with an SDN-based monitoring solution.

- **Nuage Networks:** a software-defined networking (SDN) solution that virtualizes any datacenter network infrastructure and automatically establishes connectivity between compute resources upon their creation.

- **VMware NSX:** VMware NSX provides a complete suite of simplified logical networking elements and services, including logical switches, routers, firewalls, load balancers, VPN, QoS, monitoring and security

- **IP Infusion OcNOS™:** An economical, scalable and secure method of separating network users and resources across a common infrastructure using MPLS network virtualization.

- **Pluribus Networks Open Netvisor Linux (ONVL):** is based on a Virtualization-Centric Fabric architecture with a distributed controller based on proven cluster technology. Dell Open Networking (ON) Ethernet Switches powered by Pluribus ONVL federate into a fabric, offering enhanced insight, agility and security of virtualized computing and storage

Conclusion

Providing the industry's leading port density, low latency, and first Open Networking operating system, Dell EMC Open Networking Switching Fabrics scale seamlessly to meet application and storage demands. Standards-based Layer 2 and Layer 3 Multipathing technologies provide an increase in scalable bandwidth and HA that is transparent to both users and applications.

Dell EMC Isilon storage systems can provide scalable storage performance coupled with an 80 percent utilization rate for a single pool of storage. This industry-leading storage performance and efficiency, combined with a simple, easy-to-manage approach, helps enterprises to reduce capital expenditures as well as ongoing costs. In addition, with Dell EMC Isilon SmartPools software, organizations can optimize resources with an automated tiered storage strategy that provides them with the right combination of performance and economy.

Combing Dell EMC Open Networking product portfolio with Dell EMC Isilon's Service Oriented Architecture creates a dynamic industries horizontal and vertical infrastructure that can meet the demands of the evolving data center in a cost-effective way. By delivering a solution that provides high performance, scalability, reliability, and efficiency, Dell EMC Open Networking Fabrics and Dell EMC Isilon offer a best-in-breed solution for industries verticals and horizontals infrastructure

For more information, Visit our Solutions website at :
https://www.dellemc.com

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