



APPLICATION FLUENT NETWORK BASED DATA CENTER FABRIC

DELIVERS UNPARALLELED OPERATIONAL
EFFICIENCIES

APPLICATION NOTE

EXECUTIVE SUMMARY

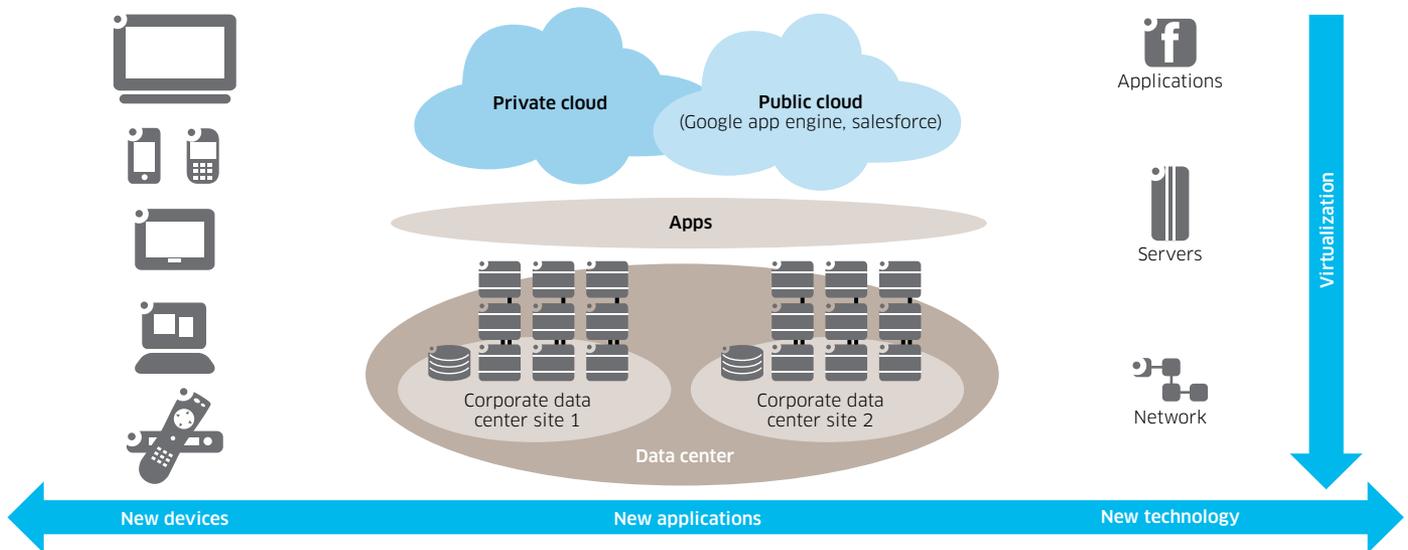
A shift in the consumption model and delivery model of applications and services has caused a perfect storm within the Data Center. Three fundamental changes are at work:

1. Real-time application proliferation, demanding dramatic increase in bandwidth
2. Application virtualization and mobility, driving needs for automation across the Data Center
3. Optimization of resources for a high-quality user experience

The changes in the Data Center are dynamic and rampant. The application infrastructure has been virtualized to enable seamless provisioning and dynamic serviceability. However most network infrastructure designs are not virtualized. Lack of automation capabilities requires extensive management and control to perform any changes coherently. This mismatch has been a bottle-neck for IT in delivering services efficiently across the Data Center, taking days if not weeks to provision new services or migrate existing ones.

Data Center IT teams managing application and network infrastructure have a growing responsibility to deliver services quickly and cost effectively at the same time. Industrialized scale and effectiveness are achieved when all the facets of the IT lifecycle involving design, deployment and operations are delivered efficiently.

Figure 1. Data Center infrastructure



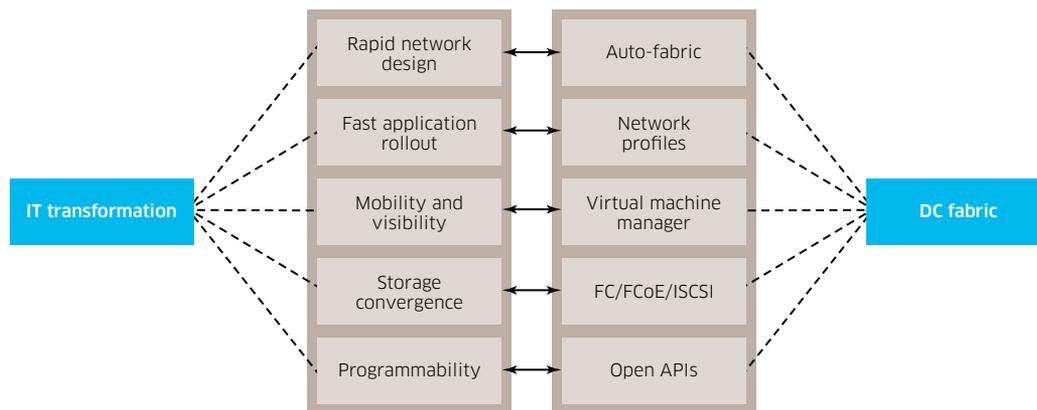
To meet current and future business demands, Data Center IT should transform their network architecture to a Data Center fabric that is enabled with the following essential characteristics:

1. **Automated** to ease network infrastructure deployment, allowing IT to focus on service delivery
2. **Agile** to allow any application service to be efficiently provisioned, transported and differentiated
3. **Visible** for application mobility and performance
4. **Converged** fabric allowing IT to consolidate assets while improving flexibility and agility
5. **Programmable** OPEN APIs support to enable programmability with no vendor lock-in, with investment protection

ALCATEL-LUCENT ENTERPRISE DATA CENTER FABRIC

The Application Fluent Network (AFN) strategy within Alcatel-Lucent Enterprise enables products and solutions that address the needs of a modern Data Center. The Data Center Fabric (DC Fabric) architecture is enabled by robust OmniSwitch™ platforms and the OmniVista™ management system.

Figure 2. Data Center transformation strategy



Five key technologies serve as the building blocks of our DC Fabric to enable this transformation in the Data Center. Here is a brief overview of the technologies and the corresponding IT operational benefits they provide.

Auto-Fabric:

The Auto-Fabric technology automates provisioning of the DC Fabric by self-configuring the nodes (switches) out of the box. It leverages standard IEEE protocols allowing other vendor switches to transparently integrate in the Fabric. Each node auto-discovers its neighbors and self-provisions, allowing IT to “scale in-scale out” the fabric with ease. The technology allows the formation of a multi-path fabric with multi-homed access, providing a highly available DC Fabric.

- Auto-Fabric reduces the time to roll out a new fabric
- Auto-Fabric reduces the overhead required for adopting a fabric architecture

Network Profiles:

Virtual Network Profile (vNP) facilitates secure and automated binding of virtual applications to the fabric. The applications are secured with embedded Access Control List (ACL) policies in the vNP. The network profiles become active on application instantiation and during mobility of application across the fabric, enabling seamless mobility and simplifying policy management.

- Easy rollout of new applications with minimal to zero fabric administration effort
- Agility and elasticity in application provisioning and mobility

Virtual Machine Mobility:

The VMM technology in the OmniVista 2500 Network Management System facilitates real-time and historical visibility of vMotion across the fabric. VMM provides IT with complete application and network visibility. VMM enables effective performance monitoring of the application in correlation with the fabric path, breaking the silos between application and network infrastructure. Reporting and alarm generation for bandwidth, latency and jitter thresholds is just one of the unique features.

- Provides single pane visibility into applications, network and service performance
- Application service-tied fabric service levels provide advance notification to IT if the service performance degrades
- Enables the Data Center IT team to manage the service delivery

Converged Fabric:

As application mobility across the Data Center is a de facto requirement, so is storage convergence. To maximize utilization and monetize investments, IT teams can now use lossless Ethernet to carry server, storage and application data on a single infrastructure, improving the efficiency and quality of delivered services. The combined benefits of lossless and low-latency Ethernet make a strong case for deploying a single converged fabric.

- Enables hardware consolidation by adopting an end-to-end Converged Ethernet network for LAN/SAN transport
- Provides concurrent support for Ethernet, FC, FCoE, NAS, and iSCSI, enabling deployment anywhere across the fabric

OPEN Interfaces/APIs

Network programmability enables IT with unparalleled agility, providing the capability to automate provisioning, monitoring and visibility of network services. This automation opens the possibilities of instantiating end-to-end service workflows across the traditional boundaries through home-grown or Open Source initiatives. Our DC Fabric supports industry-proven OpenFlow 1.3.1, OpenStack integration with neutron plugin and a rich set of RESTful APIs, providing a fabric open to orchestration.

- Automate service orchestration
- Automate network resource control for on-demand optimization
- Standards-based OPEN APIs providing investment protection

These technologies enable the Data Center network to transform to a DC Fabric that can be consumed for efficient service delivery. IT can now design and deploy an automated DC Fabric that is scalable and efficient, agile for service provisioning and secure for applications to seamlessly connect from anywhere with a centralized policy infrastructure. In short our DC Fabric provides a cost-effective solution by simplifying all facets of the Data Center IT lifecycle:

- **Design:** by enabling scale-in/scale-out architecture
- **Deployment:** by enabling end-to-end service automation
- **Operations:** by enabling visibility and programmatic orchestration of services

To get more details on these and other advanced capabilities on the OmniSwitch platform, please visit enterprise.alcatel-lucent.com