Data Center Migration – "Lift and Shift" Use Case Scenario

Why Datacenter Migration Is Challenging for Enterprises

Datacenter migration projects are usually complex and involve considerable planning and coordination between multiple teams, including network, security, application, server, storage, facilities and compliance teams. Typically, such projects take longer than expected and go beyond the planned budget. This is because network and security are the foundation of many other aspects of computing. Datacenter migration changes this foundation, often causing delays that are exacerbated by the need for coordination among cross-functional teams.

Furthermore, conventional networking techniques for datacenter network migration frequently involve changes in subnet designs, IP address assignments and routing, along with rule changes for security access and firewalls. Many applications, particularly legacy programs and their business automation wrappers, make implicit assumptions about IP addresses or other network parameters that are associated with existing datacenters locations or computing environments. Changing these networking settings during datacenter migration raises the risk of applications failing, as illustrated in Fig. 1. A typical enterprise datacenter can host hundreds of applications, and the work to assure the portability of these applications during migration can be overwhelming.

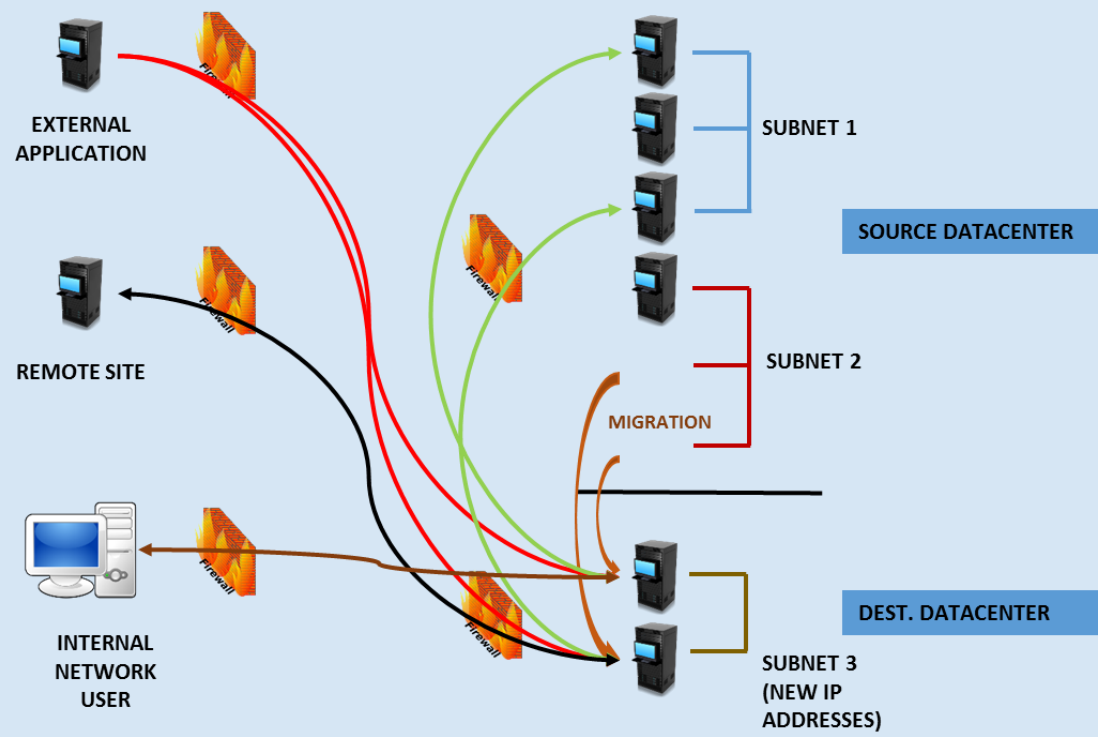

Figure 1. A change in IP address of servers being migrated has several impacts

The CoIP™ Platform is designed to support transparent and straightforward datacenter network migration using CoIP's next-generation cloud overlay network technology. CoIP allows enterprises to define the legacy network environment in a virtual network plane so that the applications are decoupled from the physical network changes

underneath. With CoIP, enterprises can choose the most appropriate migration strategy along the range from an "all-at-once" approach to migrating one application at a time without impacting applications in the legacy datacenter. This Application Note describes application scenarios utilizing CoIP for datacenter network migration and the benefits provided by the CoIP solution.

Benefits of Using CoIP for Datacenter Network Migration

The CoIP platform is advantageous when undertaking datacenter network migration in numerous ways, most importantly:

- The migration is accelerated by decoupling the applications from the physical network changes using an overlay network technology.
- Risks are lowered since selected applications can be migrated one at a time rather than migrating the entire datacenter at once.
- A single, unified solution can be applied to the datacenter migration regardless of whether the destination datacenter is private, hosted or in the public cloud.
- The impact to corporate compliance and governance is minimized by maintaining the existing physical security perimeter infrastructure.
- The migration is efficient due to fast time-to-trial and time-to-production together with optimized ROI.

Typical Scenarios for Datacenter Network Migration

Datacenter network migrations can be performed all at once, or in a staged fashion, that is, one or a few applications at a time, as follows:

- "Lift & shift" one application and its associated network environment to another location
- "Lift & shift" a number of applications and their associated network environments to another location
- "Lift & shift" the entire datacenter network to another location

These types of migrations work on the same principles and the methodology described in the document can be applied to them all.

Example Solution: All-at-Once "Lift & Shift" Datacenter Network Migration

This section focuses on an example of using CoIP technology to "lift and shift" a complete datacenter network from one location to another. This wholesale migration is accomplished without changing the IP addresses of the servers or other network parameters such as subnet mask, default gateway and host name.

The scenario described here has two sets of servers– the source servers, as shown in Fig. 2, and the destination servers, shown in Fig. 3.They are located in different datacenters and each datacenter has its own firewall, physical subnets, and so on.

The source datacenter has three physical subnets, each with its own unique physical subnet IP address. These subnets are being accessed by applications and users within the source datacenter as well as by applications in external datacenters and users who are located outside of the datacenter.

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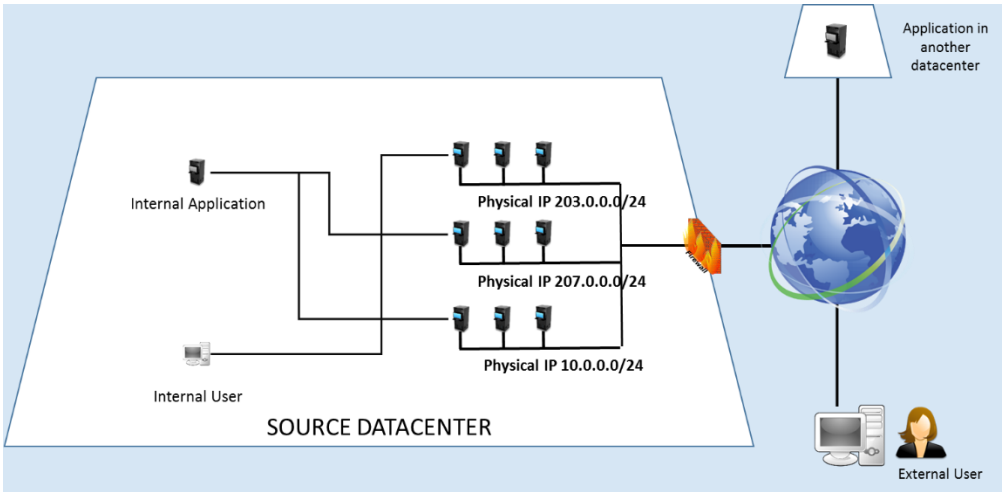

Figure 2. Source datacenter configuration before the migration

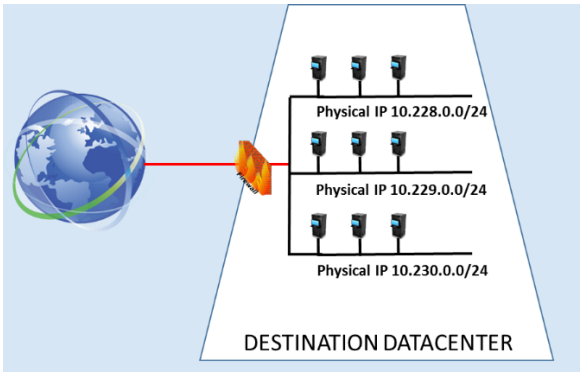

Figure 3. Destination datacenter with the new servers before migration

Once the destination servers are installed, setting up the migration using CoIP is straightforward. All that is required is to deploy the following CoIP components, as shown in Fig. 4:

- CoIP Controller Appliance (available as a physical appliance, or a virtual appliance for use in the Microsoft Azure and Amazon AWS cloud services)
    - The CoIP management portal, called zCenter, runs on the CoIP Controller Appliance. Through zCenter, Application Profiles can be defined that describe policies for CoIP connections and security. CoIP routing and firewalls will be implemented by the system automatically once the endpoints (VM, server, CoIP Edge Gateway) are registered within the Application Profile.
    - zCenter also provides Cloud Connector functions that drive the VM management APIs in the most popular public cloud datacenters, currently including Amazon AWS, Microsoft Azure, Rackspace and HP Cloud.

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- CoIP Edge Gateway
  - The CoIP Edge Gateway can be easily implemented using a VM or a physical server. The provisioning for an Edge Gateway can be managed directly from the CoIP zCenter portal.
  - The CoIP Edge Gateway is a CoIP endpoint that bridges IP traffic between the physical network plane and the CoIP plane. As part of the Application Profile policies, a physical IP address or address range can be permitted to connect to the selected CoIP endpoints. Physical IP addresses that are not specified in the Application Profile are not able to route through the CoIP plane.
  - The CoIP Edge Gateway forwards IP packets that are targeted at specific physical IP addresses in the source datacenter to the remote server in the destination datacenter. Those forwarding physical IP addresses need to be configured in the Edge Gateway, which should be deployed in the network at a place where the forwarding packets are routable to the Gateway.
- CoIP Endpoint Clients
  - CoIP endpoint clients are straightforward to install on a VM or a server using the CoIP zCenter portal.
- CoIP Access Client
  - The CoIP Access Client allows an end user device to register itself onto the CoIP plane and access CoIP endpoints directly, regardless of where the endpoints are deployed in the hybrid infrastructure.

During the CoIP deployment, the new destination servers are assigned CoIP IP addresses that mimic the physical IP addresses of the old source servers. This maintains network transparency for applications running on the datacenter. The CoIP IP addresses are only routable on the CoIP plane, regardless of their location or the underlying physical switch/router configuration. CoIP makes use of this underlying physical network as the forwarding fabric across the hybrid infrastructure.

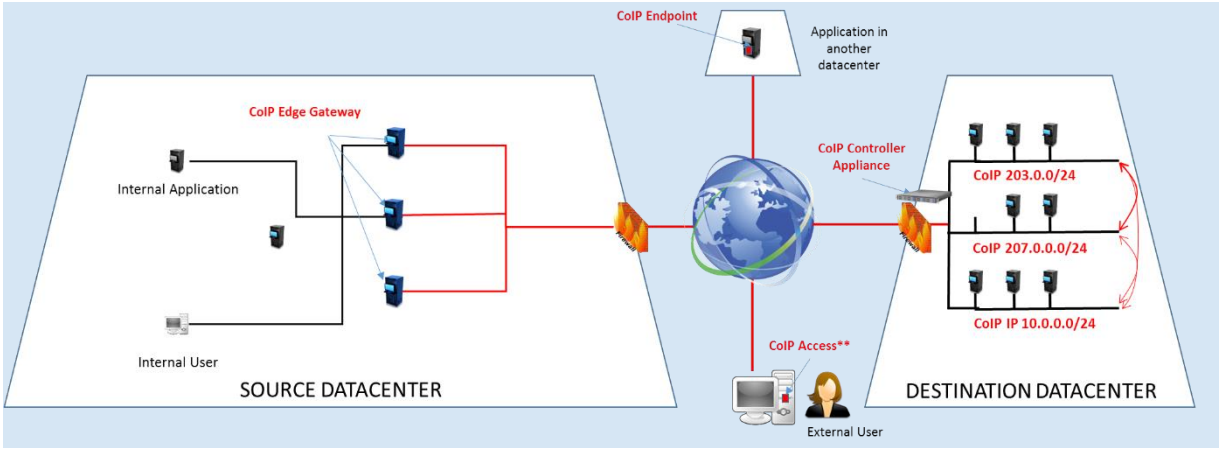

Figure 4. Setting up CoIP completes the migration

Once the CoIP plane is established, the source servers can be decommissioned. This step completes the migration.

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Conclusion – CoIP Solves the Datacenter Network Migration Problem

Using the Cloud Overlay Network approach significantly accelerates datacenter network migration compared to conventional networking techniques in use today. CoIP decouples enterprise applications from the underlying physical network and makes the network layer portable. With the CoIP platform, enterprise applications can be easily and quickly ported to any datacenter at any location, regardless of whether the datacenter is enterprise-controlled, hosted, managed hosted, or in the public cloud.