**CHAPTER 1**

Introduction

The Cisco Validated Design (CVD) for Hybrid Cloud Solution for IT Capacity Augmentation, helps customers accelerate the implementation of Intercloud Fabric solution, and achieve a faster and more flexible response to business needs, addressing the following potential challenges of hybrid cloud implementation:

- Workloads placement across heterogeneous Private and Public Clouds
- Secure extension from Private Cloud to Public Cloud
- Unified management and networking to move workloads across clouds

Cisco Intercloud Fabric is a software solution that enables customers to manage and access their workloads across multiple Public Clouds in a heterogeneous environment, providing choice and flexibility to place their workloads where it benefits the most and according to technical (capacity, security, and so on,) or business (compliance, and so on,) needs. Figure 1-1 shows the solution footprint for Enterprise customers, where Cisco Intercloud Fabric for Business is deployed in a heterogeneous Private Cloud or virtualized environment, and Cisco Intercloud Fabric for Provider, a multi-tenant software appliance that is installed and managed by the Cloud providers that are part of the Cisco Intercloud Fabric ecosystem. In addition, Cisco Intercloud Fabric can access Amazon (EC2) and Azure Public Clouds using native APIs without the need for Cisco's Intercloud Fabric for Provider.

Figure 1-1   Cisco Intercloud Fabric Solution
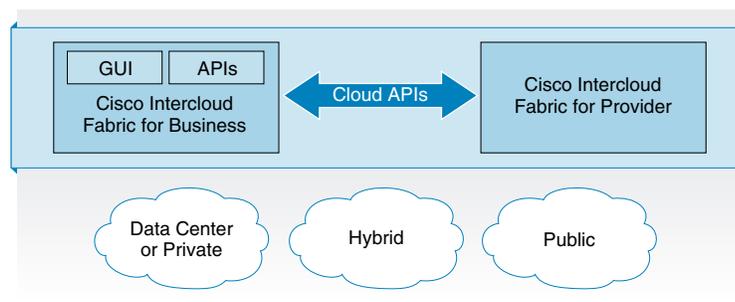
Along with the benefits for Enterprise or business customers, Cisco Intercloud Fabric solution also benefits Cisco Powered Providers to generate additional revenue stream on top of multiple Cisco's reference architectures, such as Virtual Multiservice Data Center (VMDC). Intercloud Fabric supports heterogeneous workloads, simplifying the tenant needs, and abstracting the infrastructure requirements.

This design guide focuses on the Cisco Intercloud Fabric for Business, and its end to end aspects, including the environment configuration used to demonstrate the use cases discussed later, the tests and results achieved, and best practices.

The solution validation includes the discussion of Capacity Augmentation, helping customers to understand how Cisco Intercloud Fabric is leveraged to support such scenarios, and to help IT departments support their line of businesses. Within Capacity Augmentation, this breaks down into three sub-use cases which are as following:

- **Workload Offloading (with and without network and security services)**—Workload Offloading use cases focus on the offload of a complete 3-tier application (Web/App/DB services) from the Enterprise into the Service Provider Cloud. In some Service Provider environments, the Enterprise would deploy firewall, load balancing, and routing services for data traffic being extended into the cloud. Test cases for both, with and without services, were executed.

- **Distributed Workload (with and without network and security services)**—Web front end services of a 3-tier application are deployed and verified in the Service Provider Cloud, while the application and database services for the application reside in the Enterprise Data Center. In some Service Provider environments, the Enterprise would deploy firewall, load balancing, and routing services for the web traffic that is extended into the cloud. Test cases for both, with and without services, were executed.

- **Planned Peak Capacity**—In the Planned Peak Capacity use case, Enterprise customers can use Service Provider Cloud resources temporarily to burst their workloads into the Public Cloud to meet the seasonal demands. The resources are released/decommissioned in the Public Cloud when high demand processing finishes.

Intercloud Fabric Overview

The Hybrid Cloud solution objective is to unify all clouds and provide ubiquitous end user access to any services in the cloud. For example, the end users in the Private Cloud or virtualized environments have access to services in the Virtual Private Cloud (vPC) or Public Cloud as if accessing the resources in the Private Cloud. From here, both vPC and Public Cloud are referred to as "Provider Cloud", and both Private Cloud or virtualized environment are referred to as "Private Cloud".

The Intercloud Fabric Director (ICFD) Administrative Interface or the ICFD user interface is used for the provisioning of applications and compute resources in the Provider Cloud.

These applications and compute resources can either be instantiated in the Service Provider Cloud either by the Administrator or a user interface, or if permitted, existing resources within the Enterprise environment may be offloaded to the Service Provider Cloud.

Note When this document makes reference to application or workload, it means VMs (Virtual Machines), which host Enterprise applications and workloads. At this moment the unit of operation of Cisco Intercloud Fabric is a VM.

ICF utilizes existing Enterprise resources such as DHCP, SMTP, and AD to secure and verify that existing resources are available for provisioning and that the role of the person doing the provisioning has the correct credentials and authority to provision those resources.

The ICF solution provides essential automated management and orchestration that allows organizations to control and manage cloud-based services transparently throughout their life cycles. This covers a diverse range of cloud deployments that flexibly scale from test and development to production workloads, and from initial cloud pilots to large-scale Enterprise-wide initiatives, for delivering maximum value to customers.