



# Jobber: Automating Inter-Tenant Trust in The Cloud

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## Overview

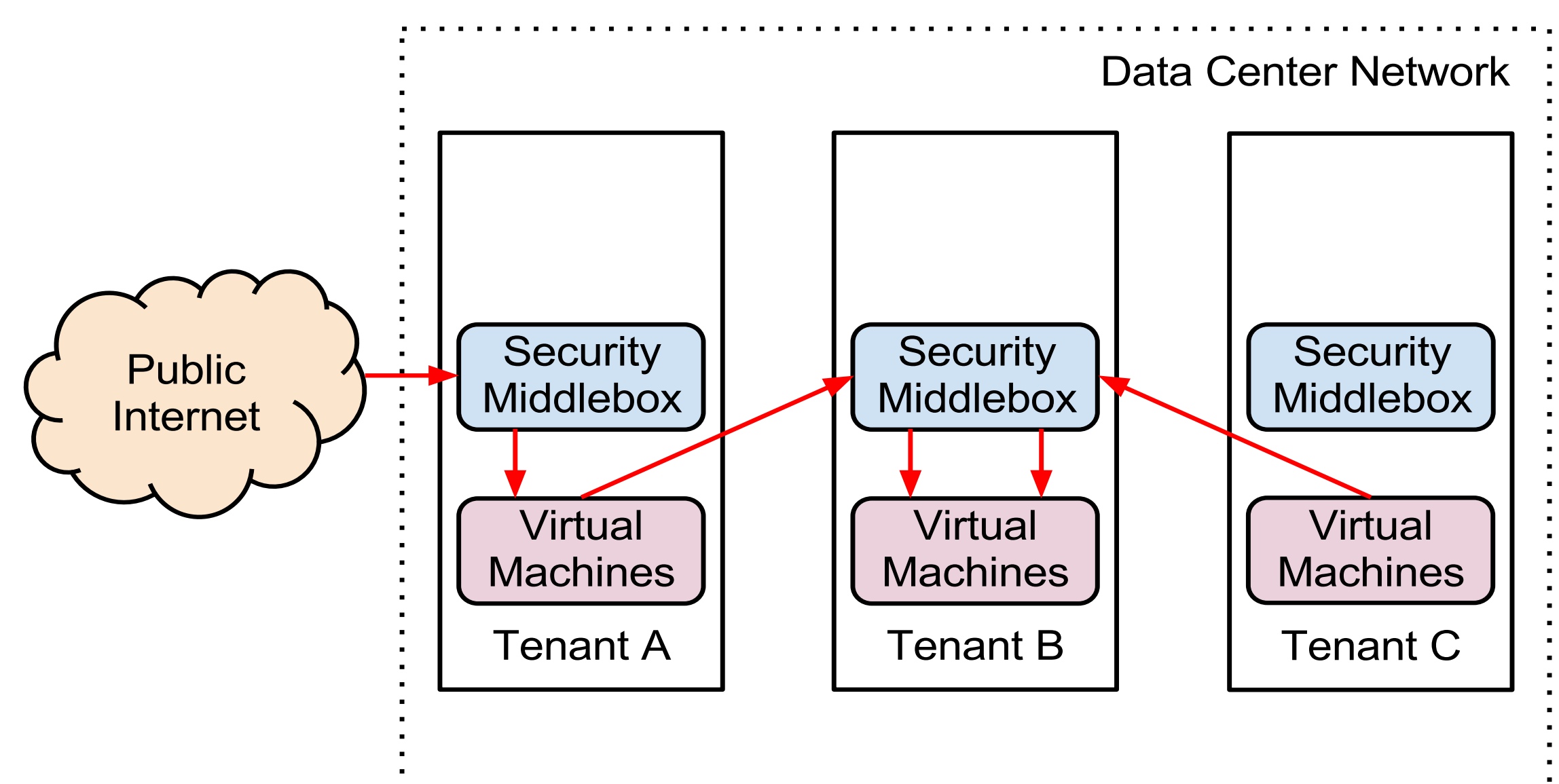
Jobber (job-ĕr) n. a middleman or broker of deals between parties, traditionally related to the exchange of securities

### The Problem

Data centers treat inter-tenant communication as untrusted traffic that must be passed through a complex and resource intensive security stack.

In the cloud, this security stack requires additional resources to run, costing tenants extra money and increasing network overhead.

Traditional security solutions rely on manually configured policies that are prone to misconfiguration, especially in highly dynamic cloud data centers.



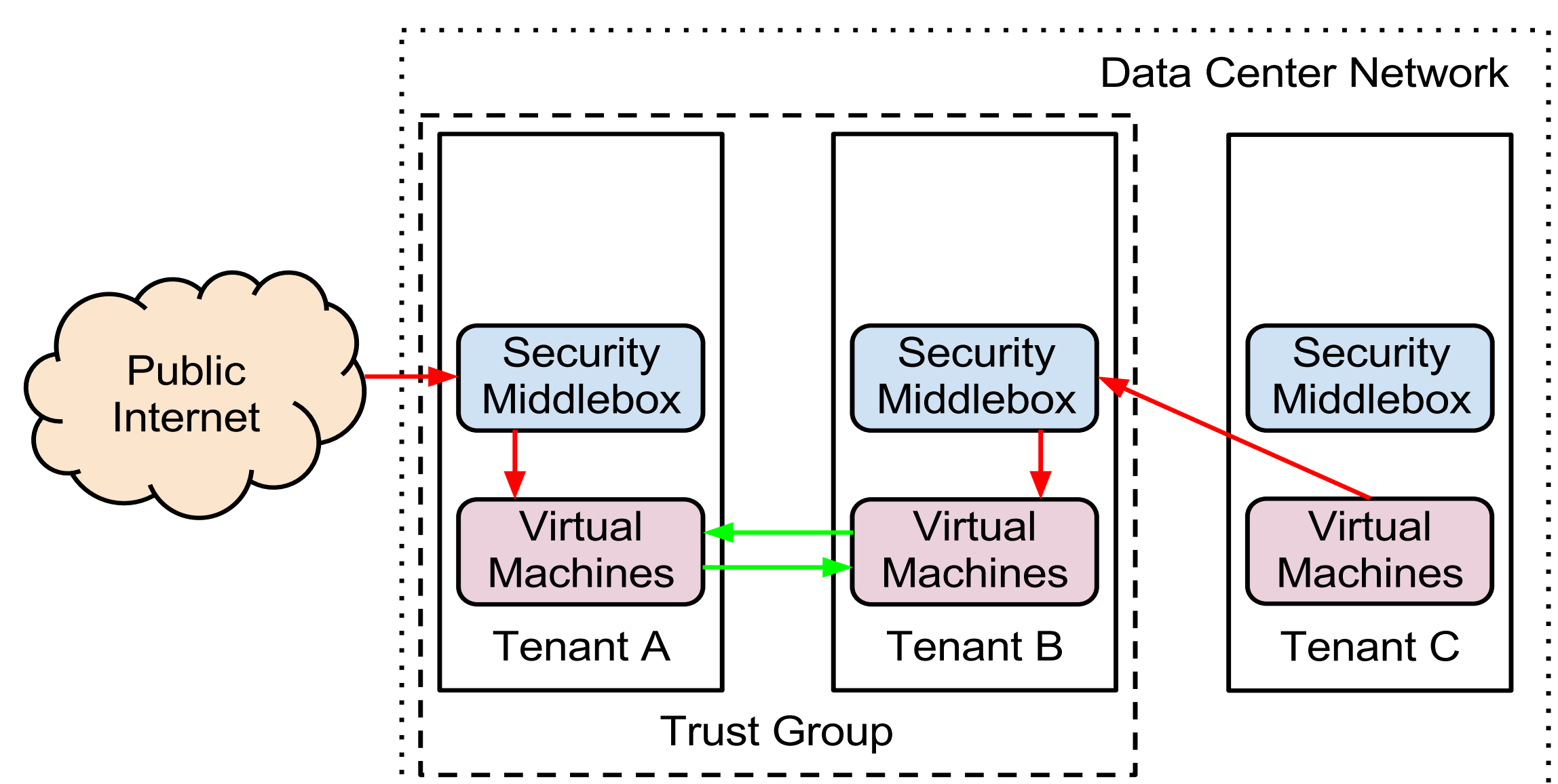
Traditional Data Center: The red flows show untrusted interactions, both between tenants and from outside hosts, processed via the traditional security stack.

### The Solution

Jobber: A dynamic network security system designed to handle the volatile nature of the cloud and optimize inter-tenant communication.

Leverages trust network concepts from Introduction Based Routing (IBR) to automatically identify trusted tenants and adapt to topology changes.

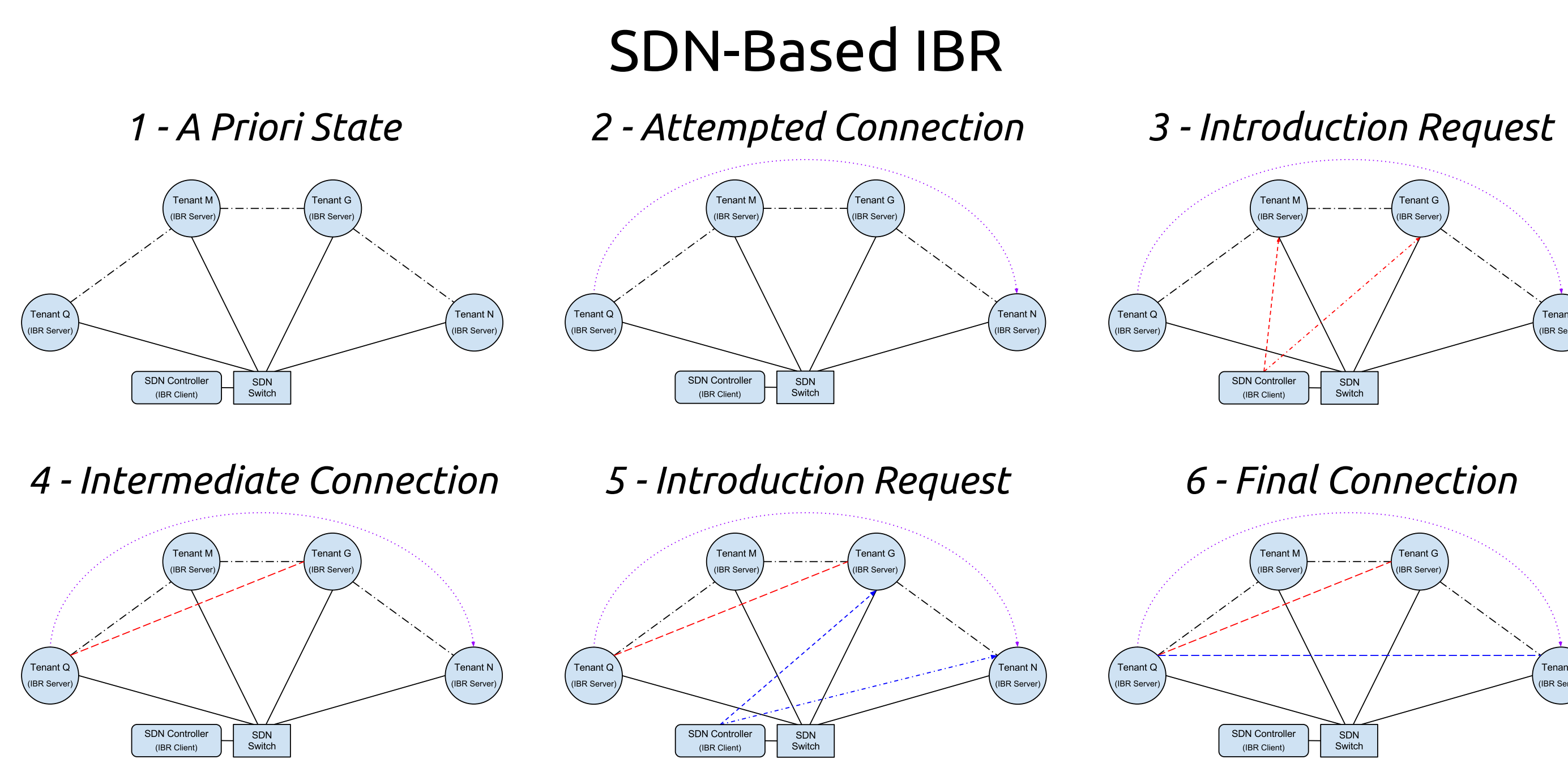
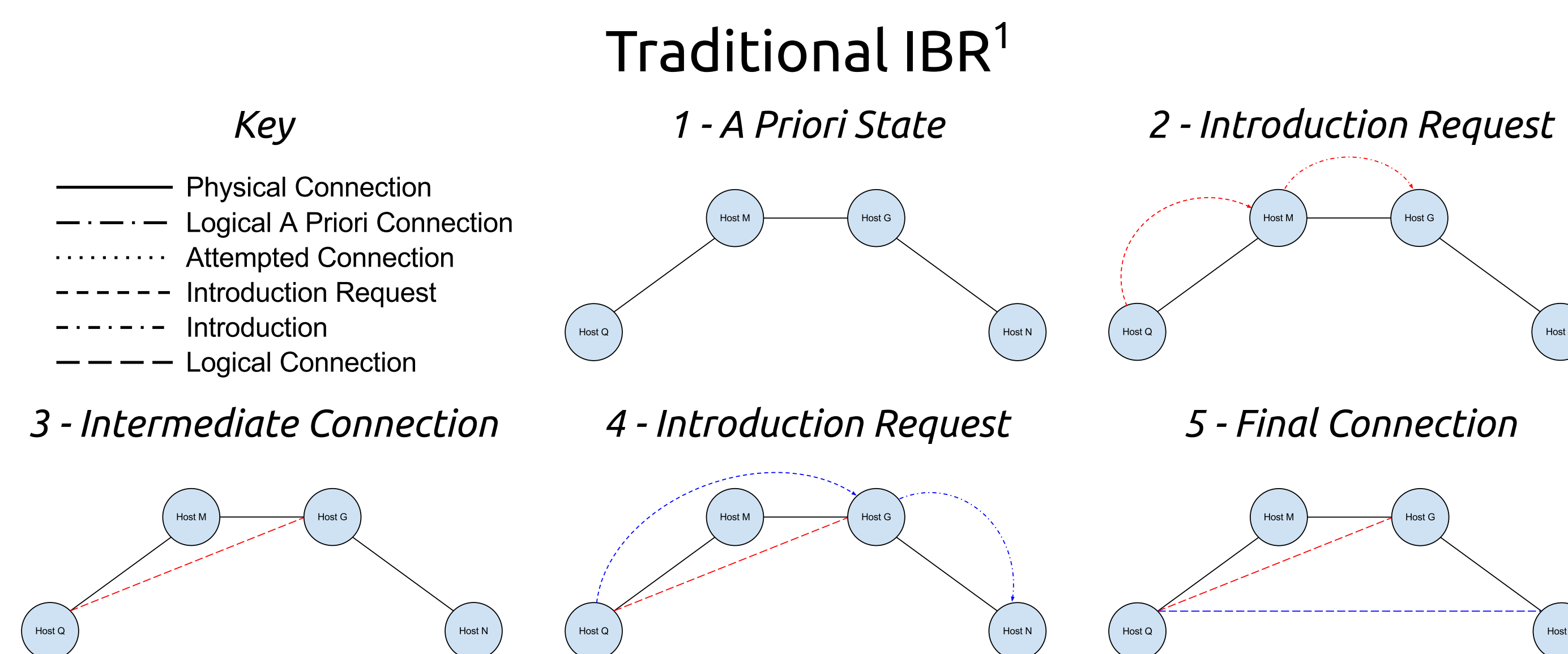
Designed for use in both legacy data centers using existing APIs and future data centers using Software Defined Networking (SDN) techniques.



Jobber Data Center: The green flows show a direct, trusted inter-tenant interaction that bypasses the traditional security stack, increasing efficiency and reducing cost.

## Concepts

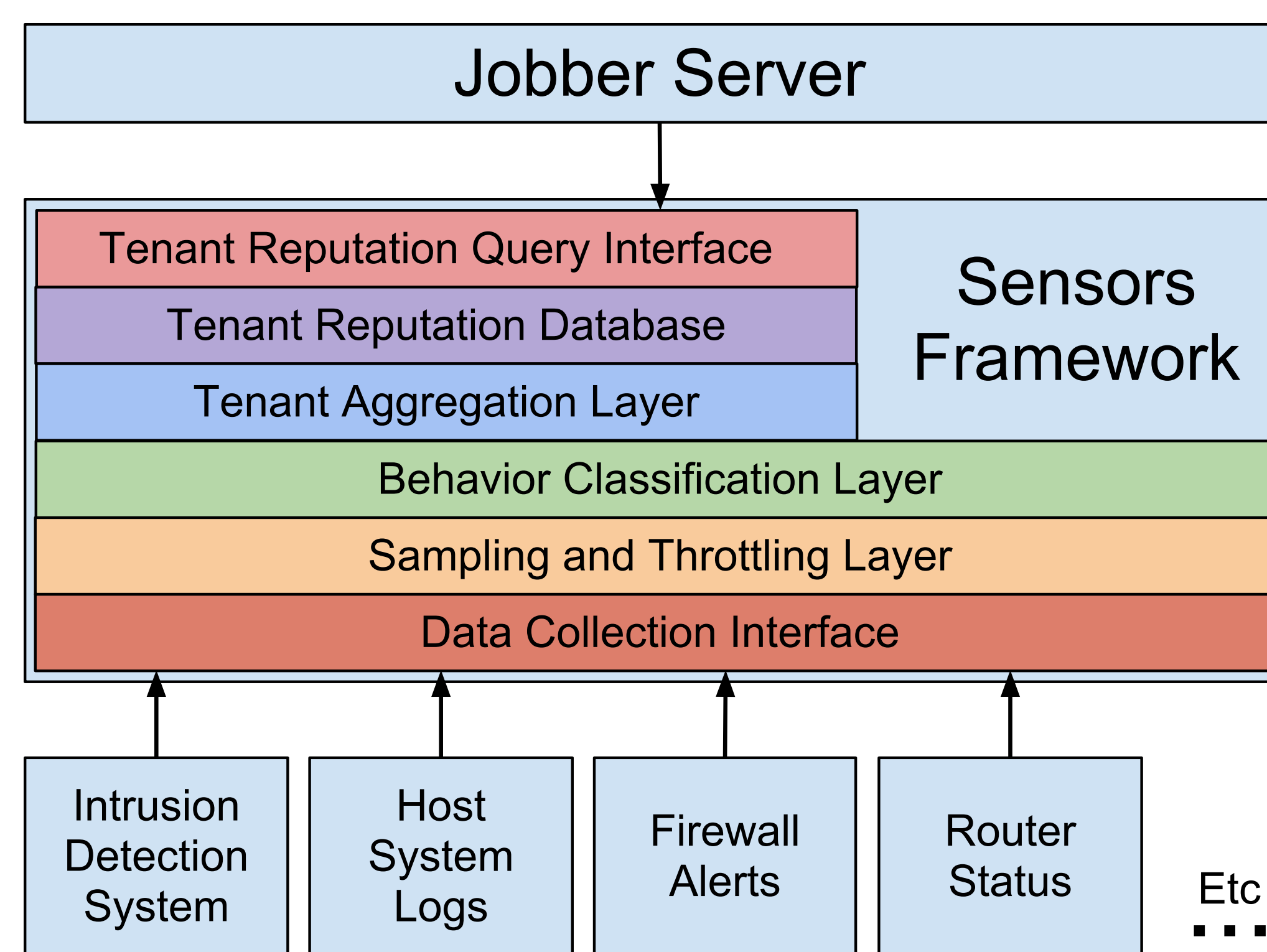
### Introduction Based Routing



### Jobber Sensors Framework

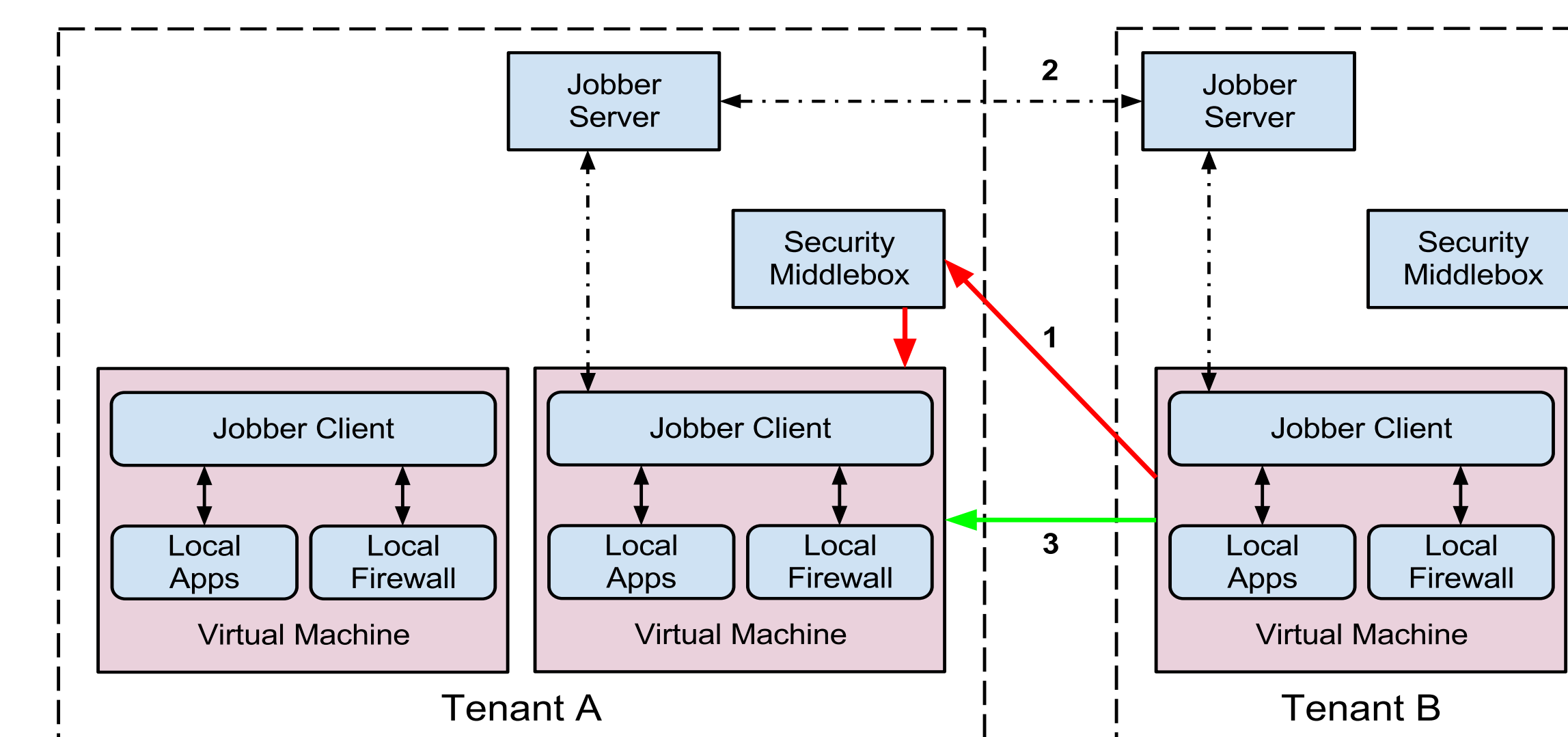
A standardized framework for collecting security information and feedback from a variety of monitoring systems and feeding it to a Jobber Server.

Necessary to provide actionable information on which tenants can base their IBR trust decisions: provides data that forms basis of trust computations.

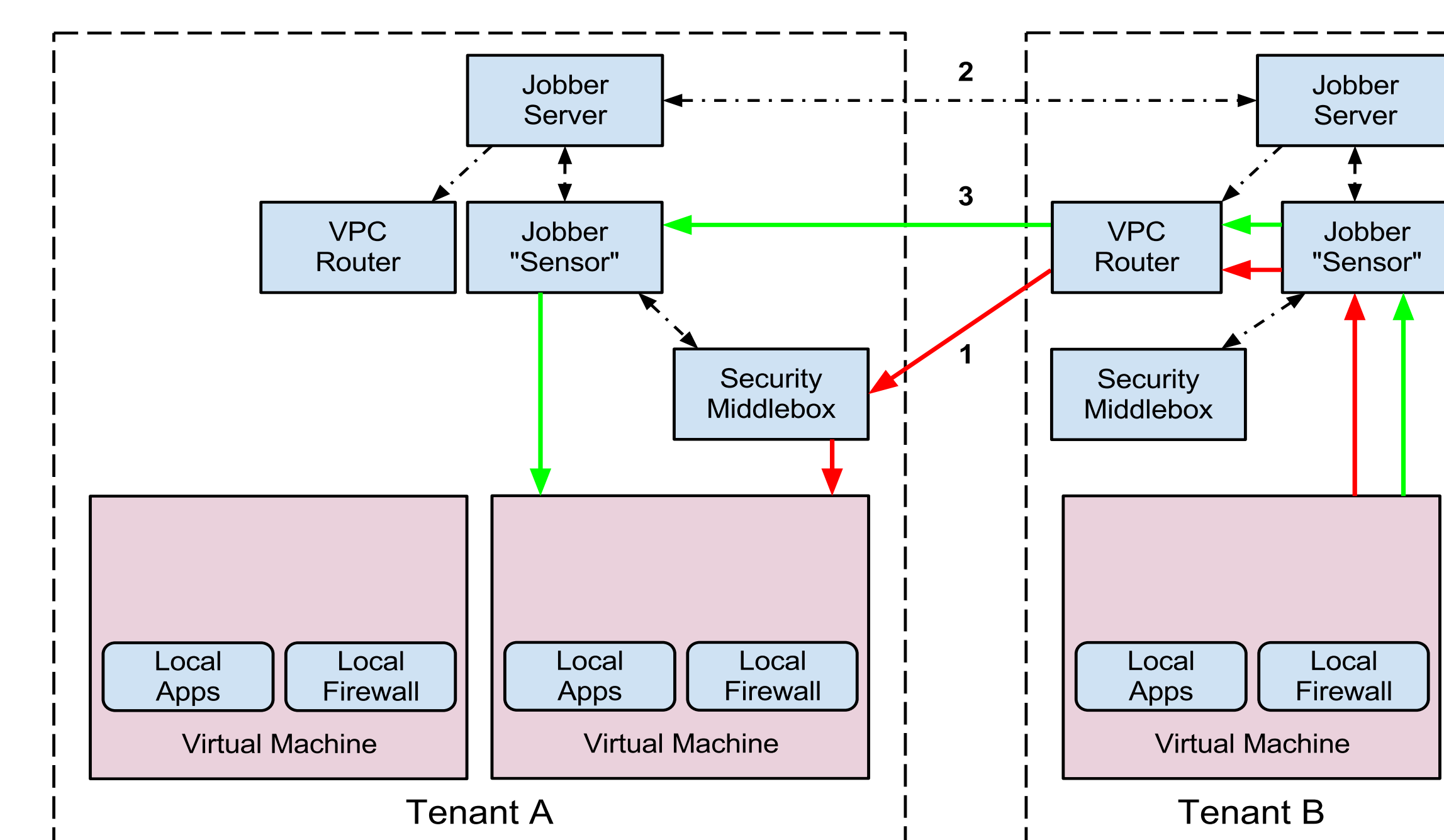


[1] FRAZIER, G., DUONG, Q., WELLMAN, M., AND PETERSEN, E. Incentivizing responsible networking via introduction-based routing. Trust and Trustworthy Computing 6740 (2011).

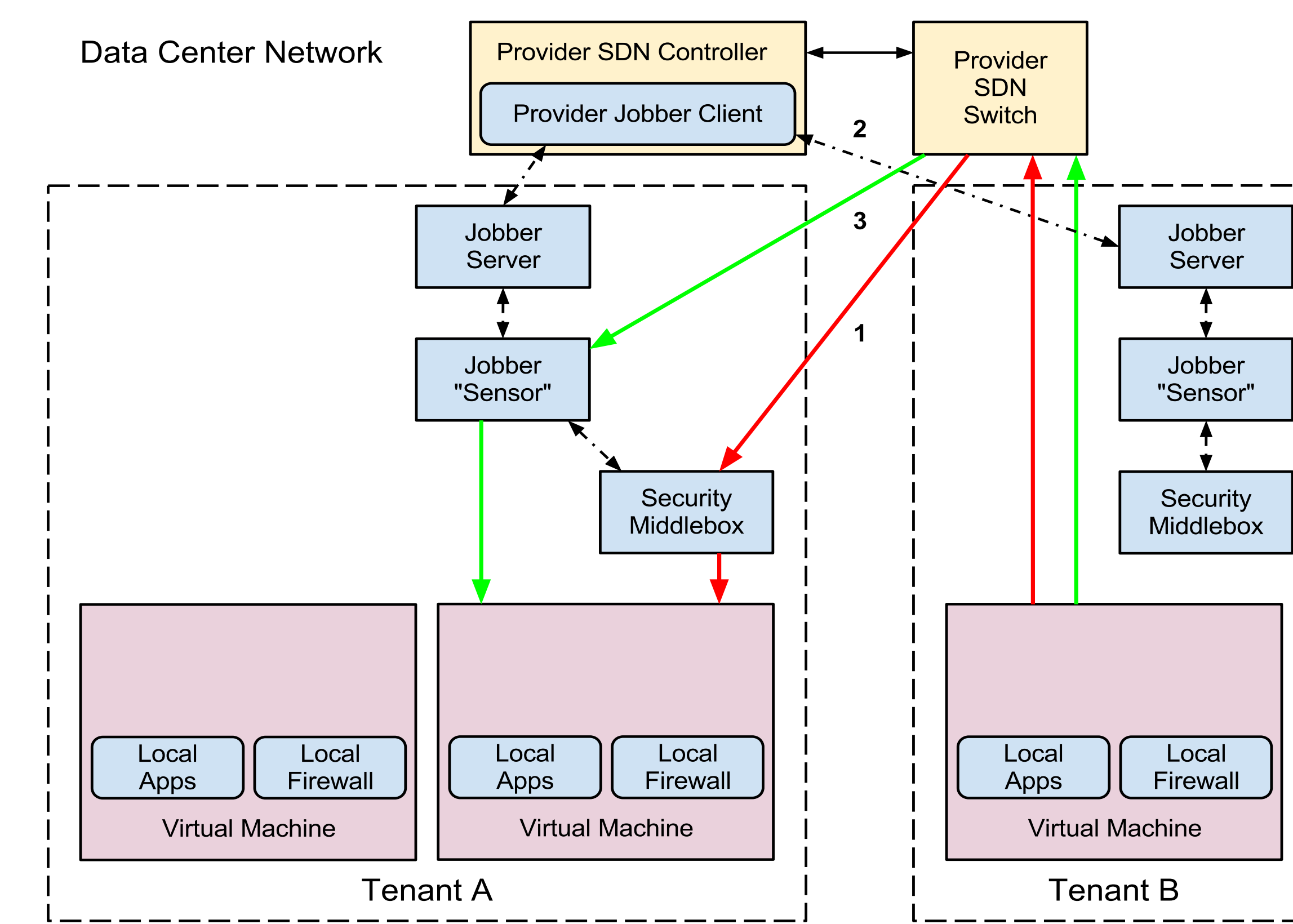
## Architectures



Legacy Data Center - Host Aware: Flow 1 (red) shows an untrusted interaction processed via the traditional security stack. Flow 2 (black) shows the Jobber servers for each tenant interacting to request a trusted connection. Flow 3 (green) shows a direct, trusted interaction that bypasses the traditional security stack.



Legacy Data Center - Host Unaware: Flows are as labeled in previous figure with the addition of the Jobber sensor interface monitoring traffic and the programmable VPC router directing traffic between trusted and untrusted paths.



SDN Data Center - Host Unaware: Flows are as labeled in previous figure, except that the VPC router has been replaced by a Jobber-aware data center switch/router, and that the data center controller is now Jobber aware and capable of transparently creating direct connections whenever possible.