Server virtualization has only been a part of the Windows Server operating system since the release of Windows Server 2008 and the introduction of the Hyper-V role. Many organizations have migrated some or all of their server workloads to virtual machines that are running on the Hyper-V platform. From a monitoring perspective, it is important to remember that servers running as guest virtual machines consume resources in the same way as physical host server computers.

With Hyper-V server virtualization, you can create separate virtual machines, and run them concurrently by using the resources of a single server operating system. These virtual machines are known as *guests*, while the computer running Hyper-V is the *host*.

Virtual machine guests function as normal computers. Virtual machine guests that are hosted on the same hypervisor remain independent of one another. You can run multiple virtual machines that are using different operating systems on a host server simultaneously, as long as the host server has enough resources.

When you create a virtual machine, you configure characteristics that define the available resources for that guest. These resources include memory, processors, disk-configuration and storage technology, and network-adapter configuration. These virtual machines operate within the boundaries of the resources that you allocate to them, and can suffer from the same performance bottlenecks as host servers. As a result, it is important that you monitor virtual machines in the same way, and with the same tools, that you monitor your host servers.

> **Note:** It addition to monitoring the virtual machine guests, always remember that you must monitor the host that runs them.

Microsoft provides a tool, Hyper-V Resource Metering, that enables you to monitor resource consumption on your virtual machines.

Resource metering allows you to track the resource utilization of virtual machines hosted on Windows Server 2012 computers that have the Hyper-V role installed.

With resource metering, you can measure the following parameters on individual Hyper-V virtual machines:

- Average graphics processing unit (GPU) use
- Average physical memory use, including:
  - Minimum memory use
  - Maximum memory use
- Maximum disk-space allocation
- Incoming network traffic for a network adapter

Outgoing network traffic for a network adapter

By measuring how much of these resources each virtual machine uses, an organization can bill departments or customers based on their hosted virtual-machine use, rather than charging a flat fee per virtual machine. An organization with only internal customers also can use these measurements to see patterns of use and plan future expansions.

You perform resource-metering tasks by using Windows PowerShell® cmdlets in the Hyper-V Windows PowerShell module. There is no GUI tool that allows you to perform this task. You can use the following cmdlets to perform resource metering tasks:

- **Enable-VMResourceMetering**. Starts collecting data, per virtual-machine.
- **Disable-VMResourceMetering**. Disables resource metering per virtual machine.
- **Reset-VMResourceMetering**. Resets virtual machine resource-metering counters.
- **Measure-VM**. Displays resource-metering statistics for a specific virtual machine.