



VMware vSphere™ 4: Deployment Methods for the VMware® vNetwork Distributed Switch

WHITE PAPER

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Introduction

VMware vSphere™ 4 introduces a number of features designed to simplify the deployment and administration of virtualized environments.

This paper discusses and suggests the most effective methods of deployment for the VMware® vNetwork Distributed Switch (vDS) in a variety of vSphere 4 environments. These methods focus on using a vSphere Client with a vCenter™ Server to manage a number of VMware ESX™ 4 and ESXi 4 hosts using one or other or a combination of the vDS wizard and Host Profiles.

(Note: the term vDS wizard is used throughout this paper to describe the method used from within the **Networking Panel** in the vSphere Client.)

An Overview of Host Profiles

Host Profiles is a feature of vCenter Server that reduces per-host, manual, or GUI-based host configuration across a datacenter. Host Profiles captures a blueprint of a known “golden” configuration of an ESX host. It can capture the settings for an entire host including the network, storage, and security settings. This captured profile can then be used to:

- Configure other hosts in a similar way with the same settings
- Check hosts are compliant with the “golden” profile on an ongoing basis

Considerations for using Host Profiles

1. Operational hosts can be used to create Host Profiles or checked for compliance against a known profile. However, Host Profiles can only be applied while hosts are in Maintenance Mode, requiring VMs to be migrated to another host or powered down.
2. Host Profiles of ESX hosts can be applied to ESX or ESXi hosts; Host Profiles of ESXi hosts can be applied to ESXi hosts, but not ESX hosts without manual editing of the host profile. Host Profiles can make the configuration change for a Service Console port on ESX to a vmkernel management port on ESXi, but not vice versa.
3. vNetwork Distributed Switches are subject to scalability limits requiring a new profile for every “set” of hosts. Refer to the “Configuration Maximums” document for vSphere 4 for the maximum number of hosts per vDS.

Using Host Profiles for Deploying and Configuring Virtual Networks

Host Profiles can be used to capture the vNetwork Standard Switch (vSS) and vNetwork Distributed Switch configuration of an ESX host, and then apply and propagate that configuration to a number of other ESX or ESXi hosts. Note that Host Profiles can capture and apply any network configuration, not just that of a vDS. This is shown in [Figure 1](#).

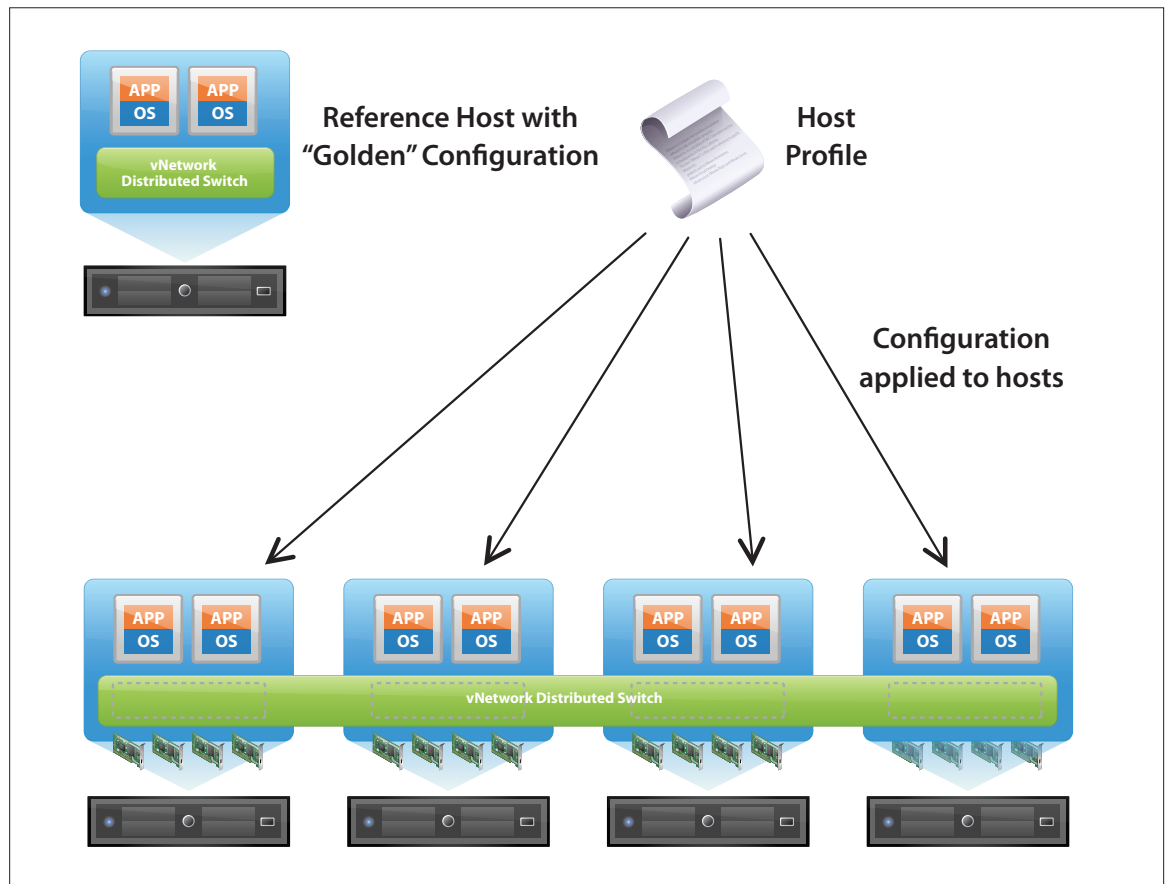


Figure 1. Using Host Profiles to propagate virtual network configuration for a vNetwork Distributed Switch

For example, if the host from which the profile was taken had a single vSS and a single vDS configured, then the hosts to which the profile was applied will each get a single vSS and each host will be added to that same vDS (since a vDS is distributed and spans multiple hosts in a Datacenter). In practice, a Host Profile could be used to add multiple hosts to a vDS at once and avoid adding hosts one-by-one through the vDS wizard in vCenter Server.

The Host Profile wizard will prompt the user for host specific information such as static IP addresses and masks for Service Consoles and vmkernel ports when it applies the configuration.

An Overview of the VMware® vNetwork Distributed Switch

The vNetwork Distributed Switch is an aggregation of multiple vSwitches distributed over multiple hosts. Instead of the per host configuration of vNetwork Standard Switches, a vNetwork Distributed Switch covers multiple hosts at the Datacenter level with a single distributed and abstracted switch with a single point of configuration. This greatly simplifies configuration and ongoing administration of the virtual network.

vDS splits the control and data plane elements of the virtual switch. Configuration and control is moved into the vCenter Server while the data plane performing the actual frame forwarding remains on each ESX host.

vDS expands upon the capabilities of vSS with a number of new features such as Network VMware® VMotion™, bidirectional traffic shaping, and Private VLANs.

Deploying vNetwork Distributed Switches

Adding hosts to a vDS involves migration of the vmnics, virtual ports and VM from the existing vSS environment. Care must be taken to ensure management connectivity to the Service Console (ESX) or vmkernel management port (ESXi) is maintained throughout the migration process.

Once a vDS is created within vCenter Server, hosts can be added one by one by migrating the vmnics (physical NICs), service consoles, and vmkernel ports, and then the VMs to new Distributed Virtual Port Groups (dvPortGroups). You can also phase the migration of the vmnics to ensure minimum disruption of operational VMs during the migration.

Choosing a Method for Migration to vDS

Migration to vDS can be accomplished in either of two ways:

1. **Using only the vDS wizard**—hosts are migrated one-by-one using the vDS wizard
2. **Using a combination of the vDS wizard and Host Profiles**—the first host is migrated to vDS and the remaining hosts are migrated to vDS using a Host Profile of the first host

Summary of Migration Methods

The table below summarizes the deployment situations and suggested methods for deployment of the vNetwork Distributed Switch:

DEPLOYMENT SITUATION	SUGGESTED METHOD	DETAILS
New servers, same vmnic config, no active VMs	vDS + HP	Migrate first host with vDS wizard. Take host profile and apply to remaining hosts
<5 Existing Servers, no active VMs	vDS	Small number of servers. Can use host profiles, but possibly easier to continue with vDS wizard
>5 Existing servers, same vmnic configs, no active VMs	vDS + HP	Larger number of servers with similar vmnic configuration. No active VMs so can enter maintenance mode and use Host Profiles
Existing Servers, active/operational VMs	vDS	Cannot use Maintenance Mode as VMs active. Phased vmnic migration suggested to ensure continuity of VM communications
Existing Servers, dissimilar vmnic configurations	vDS	Enables per host tailoring of vmnic to dvUplink PortGroup mapping
Ongoing Compliance Checking	HP	Non-disruptively check network settings are compliant with approved "golden" configuration

Note: vDS = Use vDS Wizard; HP = use Host Profiles; vDS + HP = use vDS wizard to deploy first host and Host Profiles for remaining hosts

