#1. Your Virtual SAN workflow design should cover four basic areas.

Starting out, you'll need a comprehensive Virtual SAN workflow design. That means making design decisions in four key areas:

- **Hardware selection**: Virtualized storage is unusual in that hardware selection and configuration can significantly influence the performance of your virtual machine. For that reason, it’s important to avoid non-supported devices and incorrect firmware/drivers. As you design your Virtual SAN, check VMware’s Virtual SAN Compatibility List to see which devices are supported.

- **Storage policy**: Virtual SAN gives you the flexibility to configure your virtual machine’s performance and availability characteristics. That offers a tremendous advantage over conventional storage solutions, but also places a premium on the policy choices you make up front. All the more reason, then, to include storage policy in your workflow design.

- **Software configuration**: If your hardware and networking are configured correctly, Virtual SAN software configuration should be extremely simple. Just check a series of boxes and Virtual SAN configures itself. Software configuration, though, should still be included in your design matrix.

- **Monitoring/performance testing/failure testing**: Don’t forget this final area—it’s best to decide up front how you will monitor and test your configuration, so that you know what to expect as you move beyond your proof of concept. Traditional storage monitoring and testing strategies work well for Virtual SAN, but they aren’t required. Alternative approaches to monitoring and testing your proposed configurations may well offer you more flexibility, so this is a good time to explore your options.

#2. Don’t forget to validate your network configuration.

So now you’re ready to implement Virtual SAN. Here’s one thing that often gets missed: No matter what your networking team says, always validate your network configuration. “Misconfiguration detected” is one of the most common errors seen during Virtual SAN setup. It typically means that the port group has not been successfully configured for Virtual SAN or that multicast has not been set up properly. Cisco switches, for example, do not come configured for multi-cast. So unless an IGMP Snooping Carrier has been set or IGMP snooping is explicitly disabled on the ports used for Virtual SAN, traffic will not be allowed and configuration will fail. Double check it to avoid unnecessary delays.
#3. Pay attention to network speed.

1 GB networking is supported for Virtual SAN and can operate effectively for small environments, but 10 GB networking is recommended for most configurations. The higher bandwidth helps manage infrequent but inevitable periods of high intensity use. These can occur during periods of heavy virtual machine creation, for example, or if a failure occurs and is being corrected. Replication traffic during these periods can be substantial and cause significant performance degradation as it occurs, so build in the bandwidth for it if you can.

#4. Verify your storage adapter choice and pass-through/RAID 0 controller configuration.

To ensure best performance, your controller’s queue depth should be greater than 256. Most likely, this will not be an issue—VMware’s Virtual SAN Compatibility List no longer features storage adapter cards under 256 queue depth. But be sure to verify, as older drivers are known to artificially limit queue depth.

It’s also always recommended to use a pass-through controller, as it’s the owner of the drives and can have full control of them. In many cases, only RAID 0 mode is offered. Proper configuration of this is required to avoid any problems and to maximize performance for Virtual SAN. Make sure to:

- Ensure controller caching is set to 100% read cache.
- Configure each drive as its own “array” and not a giant array of disks. Incorrect configuration can cause unnecessary overhead, showing up as a single disk to the operating system. To fix this, go into the controller and configure each disk individually. You should also ensure the partition table (if previously created) is removed.

#5. Verify firmware/driver versions.

It seems obvious, but it’s also easy to overlook: make sure that all firmware and drivers are updated to the supported levels on the VMware Compatibility List for Virtual SAN. You can buy and ship two identical servers, for example, and find that only one has the latest upgrades installed. To avoid wasting hours checking your configurations, drives etc. before you discover that the card is simply one revision behind on its firmware, take the time up front to make sure everything is up to date.