

PXE Boot Process Delay For SAP HANA Solutions

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Introduction

This document describes how to optimize the boot time for the Cisco SAP HANA Scale-Out solution with attached Dell EMC VNX5400 Storage.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Preboot execution environment (PXE) for a diskless environment
- Standard Linux init boot process

Components Used

The information in this document is based on these software and hardware versions:

- SAP HANA Scale-Out solution with EMC VNX 5400 storage.
- Cisco UCS C460-M4 and/or Cisco UCS B460-M4 servers
- SUSE Linux Enterprise System 11.3

The information in this document was created from the devices in a specific lab environment. All of the devices in this document started with a cleared (default) configuration following the solution specific Cisco internal installation guidelines. If your solution is live, make sure that you understand the potential impact of any command.

Background Information

The SAP HANA Scale-Out solutions are configured with two management servers. The management server enables the solution for PXE boot. The second management server exists for

fault-tolerance reasons in order to avoid the situation where the servers cannot boot at all in case off the first management server is not available.

Note: Once the HANA server is up and runs well, the management servers can be rebooted without any influence on the HANA servers.

The management server acts as Dynamic Host Configuration Protocol (DHCP) and Trivial File Transfer Protocol (TFTP) server.

The EMC VNX storage acts as Network File System (NFS) server in this solution and provides the **nfsroot** file system for each server.

The boot process runs through these steps:

1. The HANA server powers up and does hardware self-checks.
2. It sends a DHCP request via network interface eth0 (vlan 127) to the management server.
3. The management server provides the Server IP address and the tftp server IP address.
4. In the next step, it serves out the kernel and initrd from the tftpboot directory that is build at installation time.
5. The HANA server loads the kernel and initrd from the tftp server including all necessary drivers available in initrd.
6. Once loaded the HANA server mounts the nfsroot volume via network interface eth0 (vlan 127).
7. Finally, the HANA server runs through the default Linux init process to complete the startup.

Problem

At the time of the PXE boot process of the UCS servers, the Linux init process stops for approximately 8 minutes when the network interfaces are activated. Afterwards, the startup process continues without any further issues.

When the HANA server runs through the default Linux init process, it reads the network configuration files as well and re-activates the network interfaces. The reason is the boot option **onboot** is set to **yes** by default. This means the HANA server sends an additional DHCP request to the management server and loses the file handler for the nfsroot volume at the same time which stops the init process to continue.

There are no error messages visible in the console. In case you enter the boot options **debug initcall_debug**, you notice the NFS server stopped to respond for approximately 8 minutes with this log message generated. An example of the error message "nfs: server 192.168.127.11 not responding, still trying" in the boot log information.

Solution

Change the configuration file **/etc/sysconfig/network/ifcfg-eth0** and add the option **ONBOOT='no'**.

This is an example of the **ifcfg-eth0** file:

```
#  
# NFS Boot Network  
#  
BOOTPROTO='none'  
STARTMODE='nfsroot'  
IPADDR='192.168.127.109/24'  
ONBOOT='no'  
MTU='1500'  
USERCONTROL='no'
```

Related Information

- SUSE Documentation: "[PXE Booting NFS or iSCSI Roots for a Diskless Environment](#)"
- SUSE Documentation: "[SLES Administration - The Linux Boot Process](#)"
- [Technical Support and Documentation - Cisco Systems](#)