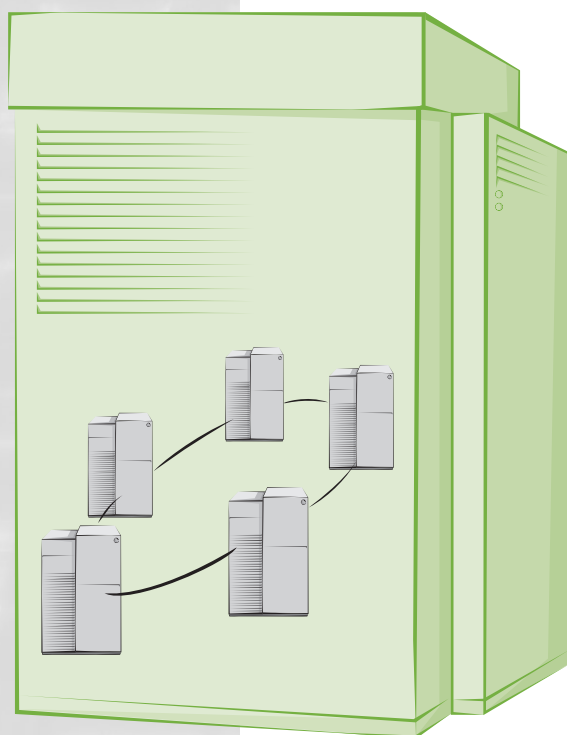


# SUSE

## LINUX ENTERPRISE SERVER – OPTION PACK: DATA CENTER SERVER



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## OVERVIEW

SuSE Linux Enterprise Server Data Center Server (SLES/DC) is a SLES operating environment that is suitable for data centers. It is supposed to facilitate the integration in the infrastructure of data centers of large enterprises.

This is accomplished by means of the integration of existing components to form a SLES “Option Pack” or “Personality” resulting in added value for the product, the maintenance, and the support agreements.

## AIMS

The following requirements were specified for a typical data center environment:

- Automatic installation of the system
- Single sign-on for administrators
- Secure automatic procedures across multiple systems
- Access protection
- System monitoring

## VALUE PROPOSITION

The Data Center Option Pack is an operating concept for SuSE Linux servers that can be used on a stand-alone basis or be embedded in an existing infrastructure.

The value gain for the customer consists of the automation and quality assurance of the productive operation in a “lights off” data center environment. Though being set up according to uniform criteria, the production systems are flexible in their individual configuration.

The systems are capable of being remotely administered from a single point of control in a secure and reliable manner. The automation renders the administration describable, contrivable, and comprehensible.

A single sign-on system for the entire environment or defined parts thereof allows the easy authorization of administrators for maintaining individual applications or the base system. Due to the segregation of tasks, administrative operations can be delegated to various specialized administrators.

Furthermore, secure automatic procedures can be implemented for groups of similar machines, thus substantially facilitating routine checks or updates of multiple servers.

The target customers are defined as enterprises running large numbers of Linux servers (more than 15-20 servers) with high demands on the quality of the administration, such as multi-shift environments, enterprises already running Unix or mainframe server environments, and environments with an organizational differentiation e.g. between operating system and application operating.

## COMPONENTS

SLES/DC consists of a Control Server and the production servers. The Control Server should be scalable for up to 32 production servers (a typical rack full of 1HE systems). The Control Server is the central access point for the servers, serves as boot and installation server, and administers the boot and configuration information for the infrastructure. The production servers are generic SLES systems with SLES/DC-specific add-ons that, however, do not have a major effect on the system properties.

## NETWORK BOOT

The systems can be booted via the network using PXE. The following boot modes can be selected for each system:

- Installation
- Maintenance/rescue system
- Production
- Integrity check (optional)

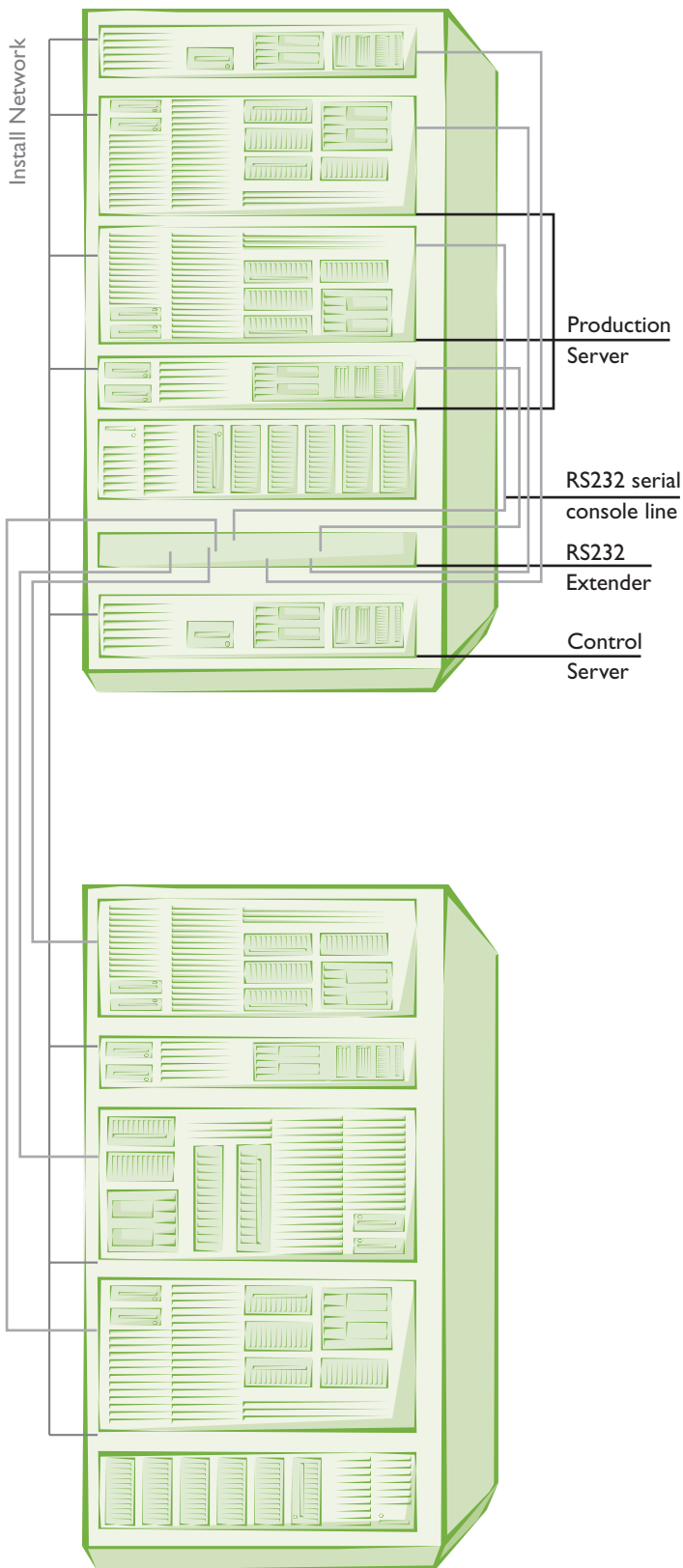


Image 1: Configuration example with Control Server (top rack at the bottom) and production servers

“Production” boots the system’s own disk, the other modes boot special initial ramdisks from the installation system.

The maintenance system comprises all system tools required for analyzing and repairing the system on the production server from the booted ramdisk. The system contained in the SLES distribution appears to be suitable for this purpose.

“Integrity check” is a security functionality that applies a procedure resembling the program “tripwire” to the main system files without using programs (that might have been changed) on the production system. This functionality is vital especially for systems with advanced security requirements.

## INSTALLATION

The installation is largely automated and is configured and controlled by the SuSE installation tool ALICE\*. For SLES/DC the servers merely require a few additional standard packages as well as local configuration settings that are performed by means of modules integrated in ALICE.

## SYSTEM MAINTENANCE

Supported by tools, SLES patch CDs can be placed on the Control Server, and the production servers can automatically run the SuSE tool YOU\*\*. A release system selects the patches that need to be installed from the bulk of available patches.

## USER ADMINISTRATION

The administration users are set up via LDAP and authenticated on all systems by means of Kerberos tickets. The use of SSH allows single sign-on for the entire system.

\* Advanced Linux Installation and Configuration Environment

\*\* YaST Online Update

## CONSOLE ACCESS

The serial console of the servers is connected to the Control Server by way of a multiport card (optionally by way of a network terminal server). The access to the console is realized by means of a mapping of dedicated SSH users to the individual serial ports on the Control Server (using minicom or a similar program as login shell).

## MONITORING

All servers log to the Control Server using syslog. Here the logs are consolidated and alerts are issued if necessary. A web interface displays the server environment to authorized administrators, can be used to toggle the boot mode, and allows access to the log files of the individual servers.

Optionally, a heartbeat\* can be implemented on the serial console in the form of a module integrated in the running mgetty. Thus, the system availability can be checked on a low hardware level (no running network required).

Optionally, an SNMP daemon can be integrated for querying the most important system parameters from the interface (only status red/green).

## HARDWARE INTEGRATION

Required hardware components: a network adapter capable of PXE booting (e.g. Intel e100) and a serial port for the console. For standard hardware, checklists should be generated for the hardware setup (e.g. common IBM xSeries models).

In some cases this documentation is generated by the SuSE Hardware Certification department when checking the systems on request of the hardware manufacturer.

\* Control signal

\*\* Advanced Linux Installation and Configuration Environment

## DISTRIBUTED COMMANDS

In connection with the Kerberos authentication, shell commands can be executed manually by the administrator or automatically in regular intervals by the Control Server. For this purpose, wrappers are needed that execute the commands on the selected server and summarize the output and the results in a clear form.

## SYSTEM INTEGRATION TOOLS

With the help of tools, new systems are to be copied from existing systems in such a way that little effort is required for the installation of a new server. SuSE installation tool ALICE\*\* base objects, PXE objects, the console port, and technical users are set up or deactivated automatically by means of scripts.

## CONTROL SERVER

The Control Server is a preconfigured, highly automated SLES installation that provides the Kerberos server, LDAP directory, installation server, and terminal server for the console access. As a dual-homed system, it can also be implemented as a firewall for the systems (the “outward” side pointing to the administrators and the “inward” side to the production systems).

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