

Managing an Ever Increasing Number of Linux-PCs at DESY

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Abstract

An ever increasing number of computer systems - mainly PCs - require elaborated management strategies and tools. In the contribution to CHEP'01 we will present and discuss new concepts and developments concerning directory services and asset management. We will in particular report on first experiences with systems currently being implemented.

Keywords: PC, Linux, Management, LDAP, NIS/YP, DCE, Asset Management

1 Introduction

At DESY as well as everywhere in HEP Linux, running on Intel-based commodity PCs, plays a major role in all areas of computing. The HERA experiments perform software developments, data processing (online and offline), and analyze mainly under Linux which is centrally supported [1]. The rapid increase of machines, governed by Linux-PCs requires a revised support, administration, and service strategy by DESY's IT-division: The consolidation of central Unix directory services which need to deal with a large number of clients. A system which allows to store and access information of all machines in a fast and convenient way (asset management).

2 Unix Directory Services

DESY's IT-division provides central Unix directory services for most of the machines in the computer center and on site. Four products are applied:

- NIS/YP is used for account data, net-groups, and auto-mounter maps.
- Account (registry) data are stored in a DCE registry.
- LDAP is used for e-mail address and telephone number lookup.
- DNS provides name service.

As a result of the rapid increase of machines in the past, the current set-up becomes unsuitable to handle the large number of clients. For the distribution of account data and netgroups NIS/YP is used. Two aspects are most critical: Firstly, a relatively small number of NIS/YP-servers is exploited by many clients. Moreover, NIS/YP-servers run parasitically on mail-, AFS-, and file-servers. Secondly, some NIS/YP-clients use a broadcast mechanism to determine a NIS/YP-server which therefore needs to operate on the same subnet. Others utilize a list of servers, but usually rely on the first one only. Both aspects lead to a partly unstable and not scalable set-up with a few overloaded servers of which some reside outside the computer center beyond central control. It is planned to improve the situation by introducing dedicated hardware as NIS/YP-servers and by methodically distributing clients to servers: Rack-mountable *Sun Netra X1* workstations offer a cost efficient, highly scalable hardware solution. Two network interfaces per unit allow to set up a failsafe system. Installation has started. It is also planned to use the Netra-cluster for other central services such as LDAP, bootp, and font-services.

To set up homogeneous standardized services which are platform independent, LDAP has a good potential for a general solution. It could offer a hierarchical, object-oriented approach which allows for a scalable and secure solution with good performance. A key issue would be to distribute replicated directories to various servers for increased performance and failsafe operation, similar to the NIS/YP approach. However, recent tests with Open-LDAP at DESY Zeuthen have indicated performance and scalability problems [2]. Further studies are needed.

3 Asset Management

In the IT-context technical resources such as computers and network devices as well as software products are called assets. They may consist of sub-assets, e.g. a PC might contain additional hard-disks, a second network interface, and an operating system which was purchased independently. The key to asset management is a centrally located easy-to-use repository. This repository contains demographic information, inventory, portfolio, contract, and process data as well as hardware, configuration, and installation information of all assets.

The asset management system, DESY currently implements [3], exploits *Peregrine's* product *AssetCenter*, a suite of integrated asset management applications:

- Asset Management tracks the different stages of an asset starting with design, acquisition, installation, support, upgrade, and ending with retirement.
- Procurement Management manages the internal fulfillment process for assets, including ordering, sourcing, and delivery.
- Lease Management manages periodic contracts such as software licenses.
- Cost Management analyzes, controls, and reports financial information for all assets.

AssetCenter supports the implementation of processes as work-flows which allows to automate what was previously done manually. The *AssetCenter*-server provides a front-end to an underlying Oracle database. The user interface is either a Windows-95/2000/NT native client or a web browser which accesses a Windows-based server. DESY's central installation service for all Unix platforms will make use of the asset management system in two ways:

- During preparation a work-flow sets up the installation server and configuration files.
- During the actual installation process the PC will primarily access the installation server as well until a basic system runs. The asset management will be accessed by means of a script-able Perl-based command line interface in a later stage.

A typical scenario to obtain a Linux desktop PC from the user's point of view could look as follows: The user connects to the asset management by using a web browser and fills a web form with his demographic data and the requested set-up. His group administrator is then automatically asked to check the order and provide additional data such as network information. The order will be passed to high level managers for approval before being sent out to a vendor. The PC could then be delivered directly to the user's office. Hardware specific data such as MAC-address and serial number are completed by IT-personnel. The PC is ready for installation. The preparation step is triggered by the asset management itself. The user needs to insert a boot-floppy and switch on the PC. He/she is asked for a receipt after the installation.

4 Conclusions

The ever increasing number of machines, in dominantly Linux-PCs, at DESY require re-structuring of the central Unix services, primarily of NIS/YP. Installation of dedicated, highly scalable hardware has started. An asset management system is being introduced to make the entire process from the ordering to the installation of Linux-PCs more efficient.

References

- [1] K. Woller et al., "After the First Five Years: Central Linux Support at DESY", CHEP'01, Beijing, P. R. China, 2001.
- [2] W. Friebel, "LDAP as a Replacement for NIS", HEPiX, Paris, France, April 2001.
- [3] J. Kreutzkamp et al., "Introducing (IT) Asset Management at DESY", CHEP'01, Beijing, P. R. China, 2001.