



JumpStart™: NIS and sysidcfg

By Rob Snevely - Enterprise Technology Center

Sun BluePrints™ OnLine - October 1999



<http://www.sun.com/blueprints>

Sun Microsystems, Inc.
901 San Antonio Road
Palo Alto, CA 94303 USA
650 960-1300 fax 650 969-9131

Part No.: 806-3751-10
Revision 01, October 1999

Copyright 1999 Sun Microsystems, Inc. 901 San Antonio Road, Palo Alto, California 94303 U.S.A. All rights reserved.

This product or document is protected by copyright and distributed under licenses restricting its use, copying, distribution, and decompilation. No part of this product or document may be reproduced in any form by any means without prior written authorization of Sun and its licensors, if any. Third-party software, including font technology, is copyrighted and licensed from Sun suppliers.

Parts of the product may be derived from Berkeley BSD systems, licensed from the University of California. UNIX is a registered trademark in the U.S. and other countries, exclusively licensed through X/Open Company, Ltd.

Sun, Sun Microsystems, the Sun logo, The Network Is The Computer, Sun BluePrints, JumpStart and Solaris are trademarks, registered trademarks, or service marks of Sun Microsystems, Inc. in the U.S. and other countries. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. in the U.S. and other countries. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc.

The OPEN LOOK and Sun™ Graphical User Interface was developed by Sun Microsystems, Inc. for its users and licensees. Sun acknowledges the pioneering efforts of Xerox in researching and developing the concept of visual or graphical user interfaces for the computer industry. Sun holds a non-exclusive license from Xerox to the Xerox Graphical User Interface, which license also covers Sun's licensees who implement OPEN LOOK GUIs and otherwise comply with Sun's written license agreements.

RESTRICTED RIGHTS: Use, duplication, or disclosure by the U.S. Government is subject to restrictions of FAR 52.227-14(g)(2)(6/87) and FAR 52.227-19(6/87), or DFAR 252.227-7015(b)(6/95) and DFAR 227.7202-3(a).

DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID.

Copyright 1999 Sun Microsystems, Inc., 901 San Antonio Road, Palo Alto, Californie 94303 Etats-Unis. Tous droits réservés.

Ce produit ou document est protégé par un copyright et distribué avec des licences qui en restreignent l'utilisation, la copie, la distribution, et la décompilation. Aucune partie de ce produit ou document ne peut être reproduite sous aucune forme, par quelque moyen que ce soit, sans l'autorisation préalable et écrite de Sun et de ses bailleurs de licence, s'il y en a. Le logiciel détenu par des tiers, et qui comprend la technologie relative aux polices de caractères, est protégé par un copyright et licencié par des fournisseurs de Sun.

Des parties de ce produit pourront être dérivées des systèmes Berkeley BSD licenciés par l'Université de Californie. UNIX est une marque déposée aux Etats-Unis et dans d'autres pays et licenciée exclusivement par X/Open Company, Ltd.

Sun, Sun Microsystems, le logo Sun, The Network Is The Computer, Sun BluePrints, JumpStart, et Solaris sont des marques de fabrique ou des marques déposées, ou marques de service, de Sun Microsystems, Inc. aux Etats-Unis et dans d'autres pays. Toutes les marques SPARC sont utilisées sous licence et sont des marques de fabrique ou des marques déposées de SPARC International, Inc. aux Etats-Unis et dans d'autres pays. Les produits portant les marques SPARC sont basés sur une architecture développée par Sun Microsystems, Inc.

L'interface d'utilisation graphique OPEN LOOK et Sun™ a été développée par Sun Microsystems, Inc. pour ses utilisateurs et licenciés. Sun reconnaît les efforts de pionniers de Xerox pour la recherche et le développement du concept des interfaces d'utilisation visuelle ou graphique pour l'industrie de l'informatique. Sun détient une licence non exclusive de Xerox sur l'interface d'utilisation graphique Xerox, cette licence couvrant également les licenciés de Sun qui mettent en place l'interface d'utilisation graphique OPEN LOOK et qui en outre se conforment aux licences écrites de Sun.

CETTE PUBLICATION EST FOURNIE "EN L'ETAT" ET AUCUNE GARANTIE, EXPRESSE OU IMPLICITE, N'EST ACCORDEE, Y COMPRIS DES GARANTIES CONCERNANT LA VALEUR MARCHANDE, L'APTITUDE DE LA PUBLICATION A REpondre A UNE UTILISATION PARTICULIERE, OU LE FAIT QU'ELLE NE SOIT PAS CONTREFAISANTE DE PRODUIT DE TIERS. CE DENI DE GARANTIE NE S'APPLIQUERAIT PAS, DANS LA MESURE OU IL SERAIT TENU JURIDIQUEMENT NUL ET NON AVENU.



Please
Recycle



Adobe PostScript

JumpStart™: NIS and sysidcfg

In the Solaris™ 2.1 release, Sun Microsystems introduced `auto_install`, which is now known as, JumpStart™. JumpStart technology allows automation of the install process, while simultaneously allowing specific customization of a Solaris operating environment installation. This has three major benefits for I.T. professionals:

- It simplifies custom installations of Solaris software, including adding or deleting of specific software packages, disk partitioning, and other non-Solaris software as well.
- It provides a simple way to help ensure that a set of machines are all installed exactly the same.
- It saves time.

The specific requirements of the JumpStart profiles depend on the environment the machines are used in. There are as many different environments as there are Sun customers. However, this article focuses on getting a machine to the point where you can use the install profile of your choice in a totally automated way. Getting to that point is common to virtually all Solaris operating environment installations.

Booting a Machine off the Net

Two information services are required to boot a machine off the net for an installation: `ethers` and `bootparams`. The information for either or both of these can be located either in a NIS map or a file contained in `/etc` on the Solaris operating environment installation server.

ethers

Ethers is the Ethernet (MAC) address of the machine and that machine's hostname. For a machine with the hostname `sephora`, the entry in the `ethers` file or `ethers` NIS map would look as follows:

```
8:0:20:8e:e8:71 sephora
```

Why do you need this in the first place? The machine's only hardware-level unique identifier is this Ethernet address. The map entry says this piece of hardware also has an IP address, which is represented by its hostname, `sephora`.

```
# ypmatch sephora hosts
192.29.208.127 sephora
#
```

Using the information in `ethers` you can now tell a machine what its IP address is given its specific Ethernet address.

bootparams

Because we are getting all the information and file systems off of a file system on the network, we must tell `sephora` where to mount these file systems from. That is the function of `bootparams`. `sephora`'s `bootparams` entry looks as follows:

```
sephora
root=wessex-208:/export/share/build/s998/s998_u3/11/
Solaris_2.7/Tools/Boot
install=wessex-208:/export/share/build/s998/s998_u3/11
boottype=:in rootopts=:rsize=32768
```

However, you don't need to enter this information yourself because the `add_install_client` script does it automatically and puts the info into `/etc/bootparams`.

Now that we have the two network information files we need to boot, should this information be placed in NIS maps? While there is no truly right or wrong answer, the best practice is not to put this information in NIS maps, unless you have an environment with multiple install servers serving the same network *and* you have access to only one of the install servers. This forces a bit of order and makes the people responsible for both install servers work together and creates fewer problems

with both servers trying to respond to the same request. In most cases, you just have `/etc/ethers` and `/etc/bootparams` files and set `/etc/nsswitch.conf` to use them. Make the following changes to the `/etc/nsswitch.conf` file:

`ethers: files`

`bootparams: files`

Now you can boot the machine off the net. However, to have a complete hands-off installation, you need a few more pieces. When the Solaris software boots up it wants to know several pieces of information in order to put a machine on the net. If you are running NIS, you probably already have IP address information in a hosts map. There are a few other maps you will need. One is `netmasks.byname`. This tells the machine how its netmask should be set. The format for the map entry is:

NetworkAddress Netmask

You can specify this by class A, class B, or class C address.

So all of the following are valid:

192.0.0.0	255.255.255.0 # Class A Address
192.29.0.0	255.255.255.0 # Class B Address
192.29.206.0	255.255.255.0 # Class C Address

However, you should only set the NetAddress as high as the network class address you have. If your company has its own Class B address for example, and, all nets have the same netmask, then you could just have one entry

192.29.0.0 255.255.255.0

Several changes were made between the Solaris 2.5.1 release and Solaris software 2.6 and beyond.

Solaris™ 2.5.1 Software

When you boot Solaris 2.5.1 software, you will be asked for the following information:

■ Terminal Type:

You will be asked this only if a keyboard and monitor are NOT attached to the machine, and you must provide a response at the console. The boot process will suspend until this question is answered. There is no NIS map to configure this. This prohibits complete hands-off installation of Solaris 2.5.1 software if you do not have

a keyboard and monitor attached to the system. The good news is that this was changed in the Solaris 2.6 release and beyond. If the keyboard and monitor are attached then a Sun Terminal Type is presumed.

■ Country/Locale:

Information needed for your localized version of Solaris software. This can be handled by a NIS map called locale.byname. The entry in the map is just one line and is one of the valid locale values for Solaris 2.5.1 software. So for the English locale the value is C.

Below is the language and locale map values.

TABLE 1 Locale Map Values

Language	Valid Locale Value
Chinese	zh
English (default)	C
French	fr
German	de
Japanese	ja
Korean	ko
Latin American	es
Swedish	sv
Taiwanese	zh_TW

■ Timezone:

What timezone are you in. This can be handled by the creation of a timezone.byname map. The entry would look like this.

US/Pacific Eng.Sun.COM # Sun West Coast

You can also find the listings of all timezone in /usr/share/lib/zoneinfo.

■ Date:

What is the correct date and time. The only way to handle this in the Solaris 2.5.1 release is by declaring a host the timehost. To make the machine with the hostname voug the timehost, you would make the following changes in the NIS hosts table and remake the map.

Old Entry

192.29.208.126 voug

New Entry

192.29.208.126 vouge timehost

Do this only if all machines in that NIS domain are in the same timezone. Getting the date and time from a machine over the net is fine, but the time will be delayed by a greater amount the more network hops the timehost is from the machine being installed.

Making the above changes will allow the most hands-off installation of Solaris 2.5.1 software.

New Functionality in Solaris™ 2.6 Software and Beyond

While configuring hands-off installation is possible with the Solaris 2.5.1 release, it lacks a certain degree of flexibility. Many of these issues have been addressed in the Solaris 2.6 software and beyond through the use of a `sysidcfg` file.

There are six primary functions provided by the `sysidcfg` file that we will cover here. These six functions in cooperation with a `netmasks` map enable complete hands-off installation of Solaris 2.6 and Solaris 7 software. These are: `system_locale`, `timezone`, `terminal`, `name_service`, `timeserver`, and `root_password`.

Note – If you have an environment where Solaris 2.5.1 software is mixed with Solaris 2.6 software and beyond, you can keep the above NIS maps in effect, and the `sysidcfg` file will override any NIS maps that might be used.

To use a `sysidcfg` file, a couple of rules must be followed: First, the file must be placed in a directory that is exported at least to the machine(s) that will be using it. The filename must be `sysidcfg`. And you must give another argument, `-p MACHINE:/path/to/sysidcfg/directory`, to `add_install_client`. So the command line to add the machine `sephora` using a JumpStart profile and the `sysidcfg` file would look like as follows.

```
add_install_client -c vouge:/export/jumpstart -p harpers:/
export/sysidcfg/sephora sephora sun4u
```

Both of the arguments point to the directories where the files reside and not to the files themselves. In this example, the rules file for the JumpStart profile is in `/export/jumpstart` on the machine `vouge`, and the `sysidcfg` file is in

`/export/sysidcfg/sephora` on the machine `harpers`, and both of these directories are exported to the machine `sephora`. For information on exporting files systems look at the man pages for `share` and `dfstab`.

sysidcfg File Entries Format

`system_locale=en_US`

This sets the locale to the 8 bit US/English locale. The list of locales reside in the `/usr/lib/locale` directory.

`timezone=US/Pacific`

This sets the timezone to Pacific Standard Time and includes the use of Daylight Savings Time. The list of available timezone resides in the `/usr/share/lib/zoneinfo` file.

`teminal=xterms`

This sets the default terminal type for the console. If you use, `xterms` as your terminal of choice you probably want to set this to `xterms` or `vt100`. A list of all valid terminal types can be found in the `/usr/share/lib/terminfo` directory.

`name_service=NIS`

This sets the name service to use. There are only four valid choices. The values are `NIS`, `NIS+`, `OTHER`, and `NONE`. The two most common would be `NIS` (Network Information Services, also known as `YP`), and `NIS+`, which is a new version of the network information nameservice that includes enhancements in security, and the administration of the service.

`timehost=localhost`

This sets the date and time of the machine. If `localhost` is specified it is assumed that the machine has the correct time. Additionally, a different machines hostname or IP address could be used and this would alleviate the need to define a single timehost in the `NIS` hosts map for all machines in that `NIS` domain.

`root_password="13 character encryption for a password found in the /etc/shadow file"`

If this value is set, the encrypted entry is put into the `/etc/shadow` file on the installed machine as root's password. This prohibits the machine from stopping at boot up after installation and asking for a root password. However, I do not recommend using it for a couple of reasons. First, having all machines with the same root password is not good security policy. Also, the encrypted entry is left in the

sysidcfg file on the server, making it easier to grab the encryption key for cracking. The encrypted entry is placed on the newly installed machine in `/etc/sysidcfg` and the file is readable by the world. Again making it easier to grab the encrypted entry for cracking. If you choose to use this feature, make sure that the `sysidcfg` file on the server is removed after the machine has been installed or at least make sure that the `root_password` entry is removed. And be sure to change the permissions to 600, readable only by root, on the `/etc/sysidcfg` file on the newly installed machine.

Now you have all the information you need to do complete hands-off installations of Solaris software. This will help ensure that the machines in your environment are more uniform in their installation and most importantly save you time.

Author's Bio: Rob Snevely

Rob is a member of Sun's Enterprise Technology Centers technical staff. He has over 10 years experience in UNIX system administration, networking, and performance tuning. His major responsibilities include architecting and designing data center and network architectures.