NIS (or YP)

Network Information System
(used to be called Yellow Pages)

Distribute information to a local group of machines
One master server with files, changes the files there, push the changes to slave servers.
Slave servers: often one or two per subnet. Get information from master server.
Clients: Call any server and ask.

Easier than changing the same file in several dozen machines
The data from a file is stored in a database format (dbm) and is map.

Information usually includes the following important files:
password, group, hosts, mail aliases, netgroups
and also the following (rarely used files):
networks, services, rpc, protocols

Machines are organized into groups called domains.
Machines in a domain must be trusting and are usually centrally administered.

YP Domains and Clients

The group of machines is given a name, this is called the nis domain name (that is different from your IP domain name)
`/etc/defaultdomain`: contains this name

The command `nisdomainname` is used to examine or set the domain name.

At boot time the command:
`nisdomainname ‘cat /etc/defaultdomain‘`
sets the domain name from the file.

A yp client finds a server in its domain and asks questions.

Setting up a YP client (NIS)

1) edit (create) `/etc/defaultdomain`,

2) `chmod a+x /etc/rc.d/rc.yp`
uncomment the lines about `ypbind`
uncomment other if using additional yp services

3) make sure `/var/yp` is a directory

4) If your yp server is not on the same cable, edit `/etc/yp.conf` to have the server's name or number. If it has the name you must either have the name in `/etc/hosts` or have DNS running (you have got to find out the number).

5) Set up the `/etc/nsswitch.conf` and other files to use nis.

6) Either reboot or start by hand

Starting by hand (especially for testing):
Use the following commands: (from `rc.yp`)

`nisdomainname` your NIS domain name
`/usr/sbin/ypbind`

NIS file formats

`/etc/nsswitch.conf` defines the lookup order
It is re-read everytime a lookup is done.

Example:

```
passwd: files nis
hosts: dns nis files
aliases: nis dbm
```

For each item list what is used (in order). Entries for the files, for nis, for dns (hosts only) nisplus and local data bases.

+ format compatibility:

```
passwd: compat
group: compat
```

In each of the files you may place a + where you want the NIS information included.

You can also use the netgroup format.

`/etc/yp.conf` – format allows several lines of
`server host_name domain_name`
Allows you to specify a ypserver.
Support for multiple domains.

Setting up a YP Master Server

1) Edit `defaultdomain`, and make sure `/var/yp` is a directory

2) chmod `rc.yp` and uncommenting the yp server lines, (protect with `if -e`) for `/var/yp/`*domainname*

3) Make sure you have real files for password, groups, netgroup, services, protocols.
Do not have the + entries (you have the real files, so using yp is circular).

3a) setup the domain name (by hand)
3b) as root run `ypinit -m`
(on Linux it is in `/usr/lib/yp`)

The databases are built and stored in the `/var/yp/`*domainname* directory.

4) Start `ypserv`

Setting up a YP Slave Server

Follow the steps above except use
`ypinit -s` *ip.name.of.master.server*
Name the master server for your domain.

NIS utilities

NIS used database (dbm) format.
A database is called a map
(e.g., password map).

`ypwhich`: what server am I talking to

`ypset`: use this server

`ypcat`: print what yp has in the named map

`ypmatch`: find a specified pattern in a named map

`yppush`: master server sends copies of the named map to the slave servers

`ypxfr`: slave server gets the named map from the master server

`ypmake`: rebuilds the named map from the corresponding file

Netgroup

`/etc/netgroup` — form: `name` tuple list
(on one line, use back-slash as line continuation)

```
print4 (lab84,-,cecsnet) (lab86,-,cecsnet)
file1 (lynx,-,cecsnet) (panther,-,cecsnet)
combined print4 file1 (cougar,-,cecsnet)
```

Some programs/files allow netgroups:

`print4` allows/denys something with 2 machines

Format is (machine name, user name, yp domain name)

The - indicates all users.

Typical tactic: use netgroups on all printers, control access from your yp server by changing the tuple lists.

Usage varies by application:

```
@print4     print4     +@print4
```