

NIS

Network Information Service

CIS 68C2

UNIX Network Administration

Updated: 10/22/2002

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1

NIS

□ Overview

- ✗ Network Information Service - NIS
 - ✗ Formerly: Yellow Pages - YP
- ✗ Client/server database provides central point of control for UNIX administrative files
 - ✗ Supported databases
 - ✗ passwd, groups, hosts, rpc, services, netid, protocols, mail, netgrp, shadow, publickey, networks, ethers, bootparams, printcap, amd.home, auto.master, auto.home, auto.local, passwd.adjunct, timezone, locale, netmasks
- ✗ Widely supported by UNIX vendors
 - ✗ Client support also available on many other platforms

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2

NIS Servers

- Master Server
 - ✗ Single master server maintains authoritative records
 - ✗ Records originate from standard system files
 - ✗ Eg. /etc/passwd, /etc/hosts
 - ✗ Must run **ypserv** daemon
 - ✗ Responds to network queries for records
- Slave Server(s)
 - ✗ One or more authoritative servers
 - ✗ Reduces load on master
 - ✗ Increases chances that at least one server is available
 - ✗ Copies database from master server

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3

NIS Clients

- NIS Clients
 - ✗ Network client apps make NIS queries
 - ✗ If configured in **/etc/nsswitch.conf**
 - ✗ Must run **ypbind** daemon
 - ✗ Performs database queries for a client
 - ✗ Sends IP broadcast to locate some server within the NIS domain
 - ✗ Does not cross networks
 - ✗ At least one server per physical network must exist
 - ✗ Found server becomes **bound**
 - ✗ The bound server will be used for queries
 - ✗ Red hat allows binding a server to avoid broadcast

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NIS Domains

- NIS Domains
 - ✗ Servers and clients operate within a single NIS domain
 - ✗ No relation to DNS domains
 - ✗ Set with the **domainname** command
 - ✗ Domains are not hierarchical
 - ✗ Multiple domains may exist within a network
 - ✗ Must be administrated separately

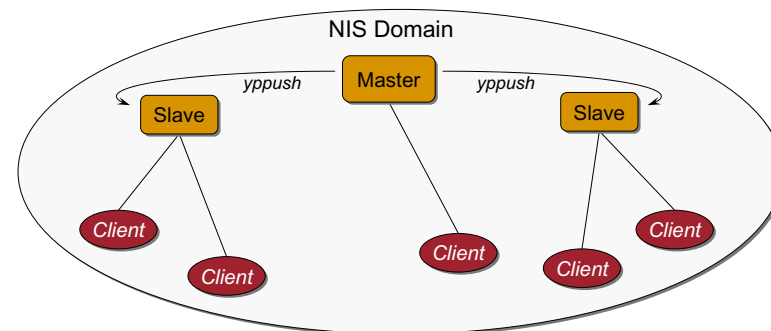
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NIS Domains

- NIS Domains
 - ✗ Consist of a master server, any number of slave servers, and clients



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NIS Database

- NIS Database
 - ✗ DBM databases created from system files
 - ✗ **Makefile** defines rules to update DBM files whenever necessary
 - ✗ Run **make** command while in **/var/yp** directory
 - ✗ Databases stored in the directory **/var/yp/NISdomain**
 - ✗ Each database is searchable only by a single *key*
 - ✗ Requires files to have several hashed translations called maps
 - ✗ Eg. **/etc/hosts** file translates into these hashed databases:
 - ✗ **hosts.byname**
 - ✗ **/etc/hosts** file searchable only by **name**
 - ✗ **hosts.byaddr**
 - ✗ **/etc/hosts** file searchable only by **IP Address**

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NIS Database

- NIS Database Transfer
 - ✗ Master runs **yppush** command to instruct slaves to obtain a copy of database
 - ✗ Used by **/var/yp/Makefile**
 - ✗ Slave servers listed in **/var/yp/ybservers**
 - ✗ Slaves pull data from master using **ypxfr** command
 - ✗ Data is pulled
 - ✗ Periodically via **cron** jobs
 - ✗ Or when requested by master via **yppush**

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NIS Configuration

- Overview – Master configuration
 - ✗ Set NIS **domainname**
 - ✗ Edit **all** rule in **/var/yp/Makefile**
 - ✗ Start **portmap** daemon
 - ✗ Edit configuration files (optional, as needed)
 - ✗ **/var/yp/securenet** and **/etc/ypserv.conf**
 - ✗ Run **ypinit -m**
 - ✗ Start **ypserv** server daemon
 - ✗ From **/var/yp**, run **make**
 - ✗ Run **yppasswd** daemon so users can change passwords

NIS Configuration

- Overview – Slave configuration
 - ✗ Set NIS **domainname**
 - ✗ Start **portmap** daemon
 - ✗ Edit configuration files (optional, as needed)
 - ✗ **/var/yp/securenet** and **/etc/ypserv.conf**
 - ✗ Run **ypinit -s master**
 - ✗ Start **ypserv** server daemon
 - ✗ Setup **cron** entries to transfer maps periodically
 - ✗ See **/usr/lib/yp/ypxfr_***

NIS Configuration

- Overview – Client configuration
 - ✗ Set NIS **domainname**
 - ✗ Start **portmap** daemon
 - ✗ Start **ypbind** server daemon
 - ✗ Add **nis** service switch to lines in **/etc/nsswitch.conf**
 - ✗ Minimal **hosts**, **passwd** and **group** file are needed for boot

NIS Command Summary

- Administrative
 - ✗ **ypinit** – initializes servers, must be run to once to use NIS
 - ✗ **domainname** – sets NIS domain name; must be set to use NIS
 - ✗ Red Hat – assign **NISDOMAIN** variable in **/etc/sysconfig/network** file for boot time binding to an NIS server
 - ✗ **yppush** – instructs slaves to update their copies of databases
 - ✗ **ypxfr** – transfers data (pull from master by slave)
- Daemons
 - ✗ **ypserv** – server daemon – runs only on NIS server(s)
 - ✗ **ypbind** – client daemon – runs on all systems using NIS services
 - ✗ **yppasswd** – server for **yppasswd**, **ypchfn**, **ypchsh**

NIS Command Summary

- Diagnostic and Query
 - ✗ **ypwhich** – outputs name of bound NIS server
 - ✗ **ypcat** – outputs an entire NIS served map
 - ✗ **ypmatch** – outputs single entry from NIS map
 - ✗ Function and syntax is like **grep**
- User Commands
 - ✗ **yppasswd, ypchfn, ypchsh**
 - ✗ Changes passwd, finger, and shell info in passwd database

NIS Limitations

- Limitations
 - ✗ Somewhat insecure
 - ✗ Any host can serve / view NIS data
 - ✗ Slave databases can be out-of-date
 - ✗ Must poll periodically using **cron** for updates
 - ✗ Not suitable for very large networks
 - ✗ Only allows a single configuration of data
 - ✗ Clients can fixate on one server
 - ✗ Query response time is decreased
 - ✗ Not particularly efficient
 - ✗ Entire database is transferred from master to slaves

Additional Information

- See Also
 - ✗ USAH - Page 521-532
 - ✗ Linux NIS HOWTO
 - ✗ <http://www.linux.org/docs/ldp/howto/NIS-HOWTO/index.html>