



NIS

Network Information Service

CIS 68C2-01

UNIX Network Administration

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

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

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

NIS Domains

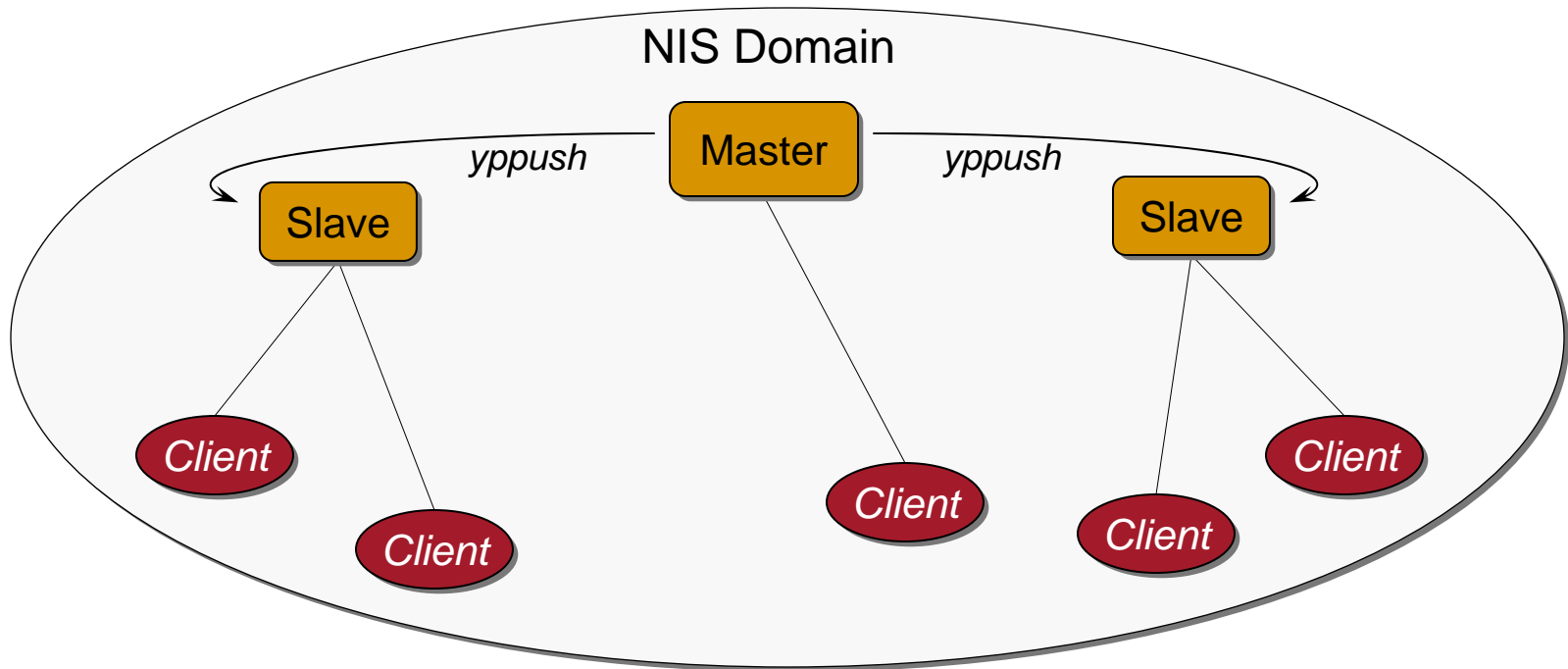
□ NIS Domains

- ✗ 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

NIS Domains

□ NIS Domains

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



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**

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/ypservers**
- ✗ Slaves pull data from master using **ypxfr** command
 - ✗ Data is pulled
 - ✗ Periodically via cron jobs
 - ✗ Or when requested by master via **yppush**

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
- ✗ **yppasswdd** – 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>