



# NIS

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## *Network Information Service*

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CIS 68C2

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

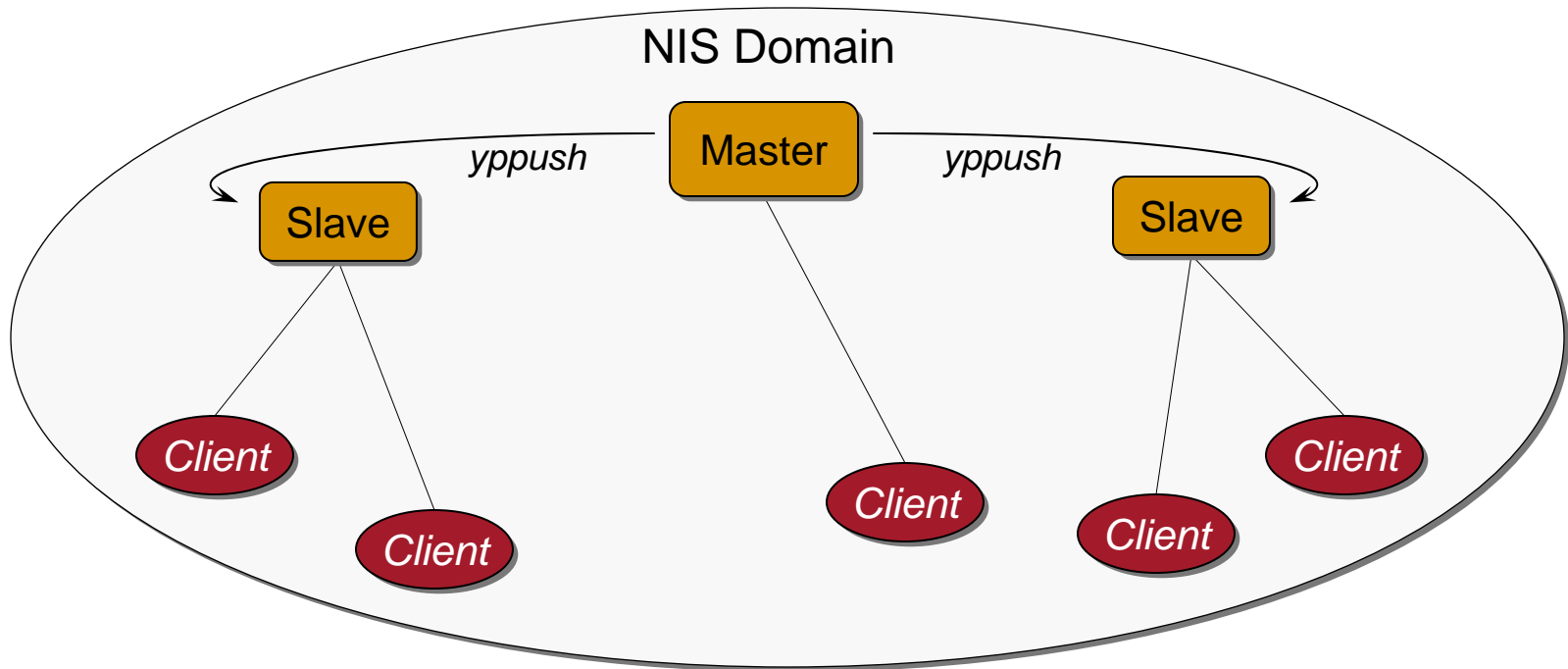
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- NIS Domains
  - ✗ Servers and clients operate within a single NIS domain
    - ✗ No relation to DNS domains
    - ✗ Set with the **domainname** command
  - ✗ Domains are not hierarchical
  - ✗ Multiple domains may exist within a network
    - ✗ Must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

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- 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

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## □ 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

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## □ See Also

- ✘ USAH - Page 521-532

- ✘ Linux NIS HOWTO

  - ✘ <http://www.linux.org/docs/ldp/howto/NIS-HOWTO/index.html>