Managing Voyager in Small Libraries
Supporting Your Server
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This Is Me

✈️ Supporting “servers” since mid-80’s
✈️ Supporting Voyager servers for eleven years
✈️ Not a real sysadmin (I’m a librarian!)
✈️ Supported Solaris Voyager O.S.*
✈️ Know nothing about split servers other than there are special configuration considerations

* Switching to Linux this summer.
My Rules of Engagement

- Never make a change on a Friday
- Always understand what you are doing
- Don’t do anything you don’t need to do
- Never rush into something; THINK first
- Make backup copies of files you change
- Make one change at a time
- Don’t start a land war in Asia 😊
What Are We Going to Cover?

★ Things that I’m glad I know
★ Things that I have wished I’d known
★ Things that I think are important
★ There’s nothing worse than feeling helpless...
★ ... or clueless
★ ... or useless
Agenda

★ You Should Know...
★ We’re Talking Now!
★ Processes
★ Kissing Your Server
★ When Things Go Right
★ When Things Go Wrong
Stuff You Should Know

- Basic O.S. commands (handout)
- vi Unix editor; vi = “visual” (handout)
- Starting and stopping “things” (handout)
- PuTTY (secure “Telnet”)
- WinSCP (secure “FTP” for uploading/downloading files and more!)
- Your configuration, software versions, etc.
Our Major Players

- Apache – Web Server
- Tomcat – Java virtual machine
- Voyager – ExLibris ILS software
- Oracle - rdbms (database software)
- Operating System - Solaris, Linux, Windows...
- Clients - Cataloging, Acquisitions, Circulation...
Terminology

- **File** – bits on disk or tape
- **Program** – executable, binary
- **Script** – ASCII file (editable) talks to shell
- **Shell** – command interpreter (UI); talks to kernel
- **Kernel** – core or key components of the O.S. (includes process mgmt.); talks to hardware
Terminology

★ Database – a system that organizes, stores, and retrieves large amounts of data.
★ Oracle – RDBMS
★ VGER instance – Oracle application
★ Tablespace – database data storage
★ Database schema – object ownership associated with a unique “username” (e.g., csmdb)
Terminology

★ / – “root” directory of the server
★ /m1 – base directory for Voyager
★ /m1/voyager – all Voyager files on the Unix server are under this directory
★ /m1/voyager/xxxdb – database directory containing all database-specific files
★ Use WinSCP to look around the file structure
Voyager versus Root User

★ Login via console or remotely.
★ Always be aware of who you are! who am I command
★ Use the `pwd` command to find out where you are.
★ Most work is done as voyager user.
★ Be very, very careful when you’re root user.
★ voyager and root users each have their own `crontabs`...
Questions?
Talking To Your Server

★ When you log in, you are said to be at the command line or command prompt. This is where you enter UNIX commands:

$dateFri Mar 1 22:59:28 EDT 2011
$uptime 10:59PM up 259 days, 9:44, 5 users, load average: 3.81, 14.27, 13.71
$hostname gonzo

★ You can combine commands in a file called a script that allows you to run them one after another.
Scripting Essentials

- Scripting allows you to automate tasks.
- If you do it more than once, use a script.
- If you script it, document your script.
- If you don’t have a doc system, start one.
- If you change something, document it.
Unix shell scripting is not difficult to get started with. If you regularly run a command manually, just put it into a script with a meaningful name and run the script instead - fewer keystrokes, fewer errors, easier to remember. A script can be just one command, it doesn't have to be long or complex. If you're ever written a DOS batch file, you can write a Unix shell script - more easily, in fact, because Unix has so many more commands which do useful things than DOS does.
Example of Korn Shell Script

#!/bin/ksh

date

uptime

hostname

★ To run: ./example.ksh

★ Note the file must be executable!
File Permissions

★ When you first create a shell script, it will usually not be executable. Use the `chmod` command with the `+x` option to add the execute permissions

```bash
chmod +x example.ksh
```

★ Use the `ls -l` command to list a file’s permissions

★ 3 permissions levels: read, write, execute
chmod Command

- Used to set/modify a file's permissions.
- Read the man pages!
- You can change the entire permission pattern of a file in a single go using one number:
  - `chmod 755 example.ksh` *(755: I don't mind if other people read or run this file, but only I should be able to modify it)*
Critical Task Scripts

★ Master Script (or scripts):
- Shuts down services
- Runs backup
- Rotates logs
- Brings services back up
- Runs Circ and Acq jobs
- Loads patrons
Other “Less Critical” Scripts

★ Log CPU, memory, disk and pagefile stats with mpstat, vmstat, iostat and sar respectively, to warn you if anything hits 90% of capacity.

★ Look for errors or warnings in critical Oracle and System log files.

★ Report on /data and /mfhd.data file sizes (regen warning).

★ Rotate logs/reports
Nice-To-Have Scripts

- Cleanup of rotated log/report archive directories
- OPAC is up
- Email is working
- Any other tasks you do frequently...
Backup Script

- Backups are mandatory (in your contract!)
- Full easier to recover from than incremental.
- “Cold” is best where you shut down everything.
- Use tape rotation.
- Rotate tapes off-site.
- Listen to Ex Libris and follow their advice.
- Monitor your backup logs daily.
Cron

- cron is a unix, solaris utility that allows tasks (such as running a script!) to be automatically run in the background at regular intervals by the cron daemon. These tasks are often termed as cron jobs.

- crontab (CRON TABLe) is a file which contains the schedule of cron entries to be run and at specified times.
Crontab Commands

★ `crontab -e` Edit your crontab file, or create one if it doesn’t already exist.
★ `crontab -l` Display your crontab file.
★ `crontab -r` Remove your crontab file.

★ **Note:** If you inadvertently enter the crontab command with no argument(s), do not attempt to get out with Control-d. This removes all entries in your crontab file. Instead, exit with Control-c.
Crontab

A crontab file has five fields for specifying day, date and time followed by the command to be run at that interval.

* * * * *          command to be executed
- - - - -          
| | | | |           +------- day of week (0 – 6) (Sunday=0)
| | | | |           +------- month (1 – 12)
| | | | |           +------- day of month (1 – 31)
| | | | |           +------- hour (0 – 23)
| | | | |           +------- min (0 – 59)
Cron Output

★ By default cron jobs send an email to the user account executing the cronjob.

★ To collect the cron execution log in a file:

```
30 18 * * * rm /home/someuser/tmp/* > /home/someuser/cronlogs/clean_tmp_dir.log
```

★ ExL: DO NOT CRON REGENS!
Cron Example: OPAC Test

# Check the status of the OPAC. Every day at 5:07am, email Tim and Laura the results
#
07 5 * * * /usr/local/utils/TestCatalog.pl | mailx -s 'Voyager OPAC status' tim@coalliance.org lguy@mines.edu Panderse@mines.edu
#
#!/m1/shared/bin/perl
#
# TestCatalog.pl  2010/03/02  Ken Herold
# Hamilton College
# See if OPAC is available
#
use LWP::UserAgent;

$uri = "http://voytest.coalliance.org";
$ua = LWP::UserAgent->new;
$response = $ua->get($uri);
$status = $response->status_line;

if ($status =~ m/200/) {
    print "OPAC is OK\n";
}

if ($status =~ m/503/) {
    print "OPAC is DOWN\n";
}

exit(0);
Weekly Restart Crontab Example

# Reboot the server 8:00am every Sunday
# Changed to init 6 as per ExL 11/2009
0 8 * * 0 /usr/sbin/init 6
#
Questions?
Getting to Know All About You

★ Each system and end-user task is contained within a process. The system creates new processes all the time and processes die when a task finishes or something unexpected happens.

★ Make list of processes by running: `ps -ef`

★ Look for processes owned by the users oracle, voyager and elgweb (Apache's httpd).
The `ps` command is used to list all running processes:

```bash
  ps  -ef
```

Important system processes are owned by root. Root starts an Apache process, but then it forks off children owned by "nobody" to actually accept connections. Oracle consists of several worker processes, plus the listener, and specific connections made by Voyager processes. Voyager itself usually runs a permanent Z39.50 server for each database and one WebAdmin daemon, plus a svr process for each connected client, some of which spawn a keysvr process.
Useful Process Commands

★ ps -ef | grep voyager
★ ps -ef | grep ora_
★ ps -ef | grep http
★ ps -ef | grep java
Questions?
Intentionally Killing Your Server

★ It’s useful to see what “death” looks like in the browser, in the client, and when you do a `ps -ef` command on the server
★ You can kill Oracle, Apache, Tomcat, Voyager
★ Scripts located in /etc/init.d
★ See the handout with list of commands
★ Run `ps -ef` when server is up for baseline comparison purposes
★ I don’t suggest you kill your O.S. 😊
Apache – the Web Server

★ If broken you’ll get a browser display error
★ Check Apache using the command:
  `ps -ef | grep httpd`
★ If it is running you’ll see six or so lines of identical httpd processes
★ If you only see your grep process try to restart it:
  `/etc/init.d/httpd2 start`
Apache Logs

★ /m1/shared/apache2/logs/xxxdb
★ access_log
★ error_log
Apache Down!
Tomcat – Java Virtual Machine

★ Apache hands off requests to the vwebv Tomcat process.
★ The vwebv Tomcat process hands off to the vxws process. The vxws process takes the data from opacsvr and hands it back to vwebv.
★ If Tomcat is broken you’ll see a page with a 500 or 502 or 503 error code, or a WebVoyáge-branded error page.
Tomcat Logs

★ /m1/voyager/xxxdb/tomcat/vwebv/logs
★ /m1/voyager/xxxdb/tomcat/vxws/logs

★ Note logs are OVERWRITTEN at restart!
Tomcat Down!

Service Temporarily Unavailable

The server is temporarily unable to service your request due to maintenance downtime or capacity problems. Please try again later.
Voyager – ILS Software

★ If down you’ll get a page with a 50x error in your browser.
★ You’ll get a connection refused error when attempting to login to a client.
★ You won’t see opacsvr, keysvr processes running.
Voyager

🌟 The “xxxdb” structure is repeated for each database, including traindb

🌟 Key directories:

- `/m1/voyager/xxxdb/ini` – The configuration files including `voyager.env`
- `/m1/voyager/xxxdb/data` – The keyword files
- `/m1/voyager/xxxdb/mfhd.data` – The holding keyword files
- `/m1/voyager/xxxdb/log` – The log files for the specific database
- `xxxdb/tomcat/vwebv/context/vwebv/ui` – root directory for skins
Don’t Touch

★ /m1/voyager/bin/2007.x.x – The server binaries (including WebVoyáge & WebAdmin binaries)
★ /m1/voyager/lib/2007.x.x – The server libraries
★ /m1/voyager/xxxdb/sbin – The server scripts
Voyager Logs

★ Voyager Server Logs
  – /m1/voyager/xxxdb/log/log.voyager
  – /m1/voyager/xxxdb/log/z3950svr_access.log

★ Voyager Deleted Records Logs
  – /m1/voyager/xxxdb/rpt/delete.item
  – /m1/voyager/xxxdb/rpt/delete.bib
  – /m1/voyager/xxxdb/rpt/delete.mfhd

★ Locations of upgrade/patch logs vary
Voyager Housecleaning

Things to clean up, IF files are no longer needed

- Directories:
  - xxxdb/rpt
  - xxxdb/log
  - xxxdb/edi
  - xxxdb/tmp
- /m1/incoming
- /m1/upgrade/v<version>/voyYYY
Voyager Down!

Service Temporarily Unavailable

The server is temporarily unable to service your request due to maintenance downtime or capacity problems. Please try again later.
Oracle

★ When Oracle goes down the ramifications are severe. This is where your data are stored.
★ Check to see if your Oracle listener is up:
  - lsnrctl status
★ Or look for processes owned by the user oracle in the output of:
  - ps -ef | grep ora_
Oracle VGER Instance

★ Multiple voyager databases share common instance
★ The VGER instance background processes:
  pmon          smon
  lgwr          dbw0 (formerly dbwr)
  ckpt          reco
  arch0         s000 & d000
  qmnc          cjq0

★ ps - ef | grep ora_ look for pmon, smon, lgw, dbw0
Indexes

★ All about searching

★ Types of Indexes

– Voyager indexes = Primary indexes
  Actually an Oracle table (bib_index)

– Oracle indexes = Secondary indexes
  bib_index_code_norm_disp_idx

– Keyword indexes = Keyword indexes
  External to Oracle

– Headings keyword indexes
  Utilize Oracle Context
When to Regen Keyword Indexes

★ 2 GB file size limit of dynamic.dc
★ Soft threshold (formula):
   If size of your dynamic.dc file compared to your
   xxxxdb.1.dc is 50% or greater, a keyword regen probably is needed
★ Run this command:  ls  -la
Why Regen

- Corrupted keyword files
- You see keysvr error messages in log.voyager
- Degraded performance in keyword searching (the formula)
- Opac, cat, bulkimport issues
- Regen ETA = 1 hour per 100,000 records.
Oracle Logs

★ Instance – level logging:
  Solaris/AIX
    $ORA_LOG/alert_VGER.log
  Windows
    D:\oracle\admin\VGER\bdump\alert_vger.log

★ Oracle networking logs:
  – $ORA_NET/..../log/sqlnet.log
  – $ORA_NET/..../log/listener.log
Oracle/Oracle Listener Down!

System Error

An unexpected system error has occurred. Please report this error to your library. We regret the inconvenience.

This page will redirect to the system start page shortly.

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Voyager Cataloging

Voyager is not available.

OK
Questions?
When Things Go Right – OPAC Tech Flow

1. Web Client Starts
2. Connect to server at known port
3. Apache Daemon communicates with vwebv (Tomcat)
4. Vwebv communicates with server at known port
5. Apache Daemon communicates with vxws
6. JDBC Connection is made to Oracle
7. Connection to Oracle made via Oracle Listener
8. Dedicated connections are made btw Listener and Oracle Database
9. Connection to Opac Server Pool
10. Individual Opac Server makes separate connection
11. Binary logs into Oracle (see server tech flow)
12. Oracle spawns a server process
13. Control returned to the client
When Things Go Right – Client Tech Flow

1. Start a client
2. Next connect to server
3. Inetd runs The Script
4. The Script runs the binary
5. Binary logs into Oracle
6. Oracle spawns a server process
7. Successful connect returned to binary
8. Binary attempts to start a keyserver
9. Control returned to the client
When Things Go Wrong

★ Determine what is **actually** wrong (PC or server?)
★ Are there error messages?
★ What changed?
★ Can you replicate it?
★ Test (check cables, different PCs, different Windows users, etc.)
★ Experience helps
★ Common sense helps too
When Things Go Wrong

★ Ex Libris recommends weekly server reboot.

★ If you are having problems and your uptime is over 30 days, do a reboot.

★ Use `w` to check uptime and who's logged in: `voyager: / => w`

★ Use `df -k` command to check available disk space.

★ Look at last night’s backup log!
Can You?

- Can you PuTTY into the server?
- Is Oracle running? `ps -ef | grep ora_`
- Check dir/file permissions for: `sbin,bin,rpt,data`
- Can you log into sqlplus?
  - Look at `voyager.env` for USERPASS
- Can you run: `tnsping VGER 3`
- Look for errors in `log.voyager`, the Oracle `alert_VGER.log`, the tomcat/apache logs, etc.
- Try the ASCII OPAC (config issue?)
Client Problems?

★ What changed? What happened?
  – Application Timed Out
  – Connection Refused
  – Unable to save this record
  – Run time error

★ Check voyager.ini file on the PC
★ Try a different PC
★ Try a different Windows user
Browser Problems?

★ The browser on your PC connects to most web servers on port 80; that is probably the port it uses to get to your production WebVoyage.

★ If you get an error that you can’t reach the server, make sure it isn’t your PC’s Internet connection or the network itself.
Log files

★ In general logs are more useful for diagnosis than prevention.
★ Default output often voluminous and includes spurious errors and warnings, and may simply be not meaningful.
★ Oracle high-water log (in the Oracle home directory) can be useful for Oracle tuning.
Important Logs

- log.voyager
- alert_VGER.log (oracle)
- error_ and access_ logs (apache)
- catalina.out (tomcat)
- /var/adm/messages (solaris)
  - grep -i warning /var/adm/messages*
- Upgrade logs if post-upgrade
- /var/adm/sulog (for su attempts)
- z3950svr_access.log
Using Tail in *Real Time*

- `tail -f log.voyager`
- press Enter key twice
- replicate your issue
- review log.voyager in “real time”
- look for WARNING, ERROR, UNABLE
More About Logs

Upgrade logs (version dependent)
- /m1/incoming/v720/vik/logs/voyager_installation.log
- /m1/incoming/patch/voy723_Files/logs/PatchLog.voy723
- /m1/voyager/upgrade/2007.2.0/xxxdb/upgrade/log.xxxdb.upgrade
- /m1/voyager/utility/2007.2.0/xxxdb/log.xxxdb.regen
- /m1/incoming/v720/voy<VER>_Files/logs/PatchLog.voy<VER>

Software logs
- /m1/voyager/xxxdb/tomcat/vwebv/logs/catalina.out
- /m1/voyager/xxxdb/tomcat/vxws/logs/catalina.out
- /m1/voyager/xxxdb/log/log.voyager
- /m1/shared/apache2/logs/alert*
- /oracle/app/oracle/admin/VGER/bdump

Find Command
- find /m1/incoming/v720 -type f -name "*[LI]log*" -ls
Logwatch

★ Will catch things like failed ssh attempts, su attempts and what commands were run with su and sudo, give you a snapshot of filesystem free space, etc.

http://sourceforge.net/projects/logwatch/files/
Be Proactive: Disk Usage

- The `df` (disk free) command can be used to look at available disk space
  - `df -k`
  - `df -h` (h=human readable)
- The `du` command can be used to see disk usage for specific files and directories
  - `du -dk /m1/* | sort -n | tail`
Memory

★ The `vmstat` command reports statistics about kernel threads, virtual memory, disks, traps and processor activity.

★ Check `/var/adm/messages` (a system log file) for swap errors.
“Tuning”

Oracle has “tuning.”

It’s all about resource allocation.

Tuned per hardware configuration (RAM, disks, # bytes/records) & contract.

Badly tuned shared memory, pagefiles, swap space, tablespace, bandwidth, etc. can all cause issues...

Your O.S. is tuned, too!
R U Firewalled?

- Incoming and outgoing packets MUST be allowed through your firewall(s), routers(s), & server(s)
- What’s your timeout?
- Did your I.T. folks make a change?
Stay Current!

⭐ Patch your O.S. (ExL will not do this for you)
  – MUST stop Apache, Voyager, & Oracle first
  – Check vendor’s web site.
⭐ Keep your Voyager version current.
⭐ Keep 3rd party software (Tomcat, etc.) current.
⭐ Make sure your hardware is under warranty.
⭐ Consider an IT infrastructure support firm.
Security is Important

- Keep current with patches
- Monitor your logs
- Enforce strong passwords and change them often
- Use firewalls, SSH (PuTTY), WinSCP
- Have good backups
- Physical security: no passwords on post-its!
You’re Not Alone: Resources

⭐ Voyager-L
  – http://voyager.ship.edu/voyagerl/
  – http://listserv.nd.edu

⭐ Voyager Administrators’ List
  – voyager-administrators@googlegroups.com

⭐ eService Knowledgebase
  – http://support.exlibrisgroup.com
You’re Not Alone: Support

- Voyager client build number.
- Windows OS and service pack.
- Username/password for module as well as server.
- Specific replication steps (including examples).
- Exact error messages.
- Date and time problem occurred.
- Server address (IP#) you are pointing to.
Questions?
Thank you for attending!

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