Quantum

StorNext 4.7.0
Dual Robot Support
(aka Multi-Robot Support)

Tony Catano,
StorNext SM Developer

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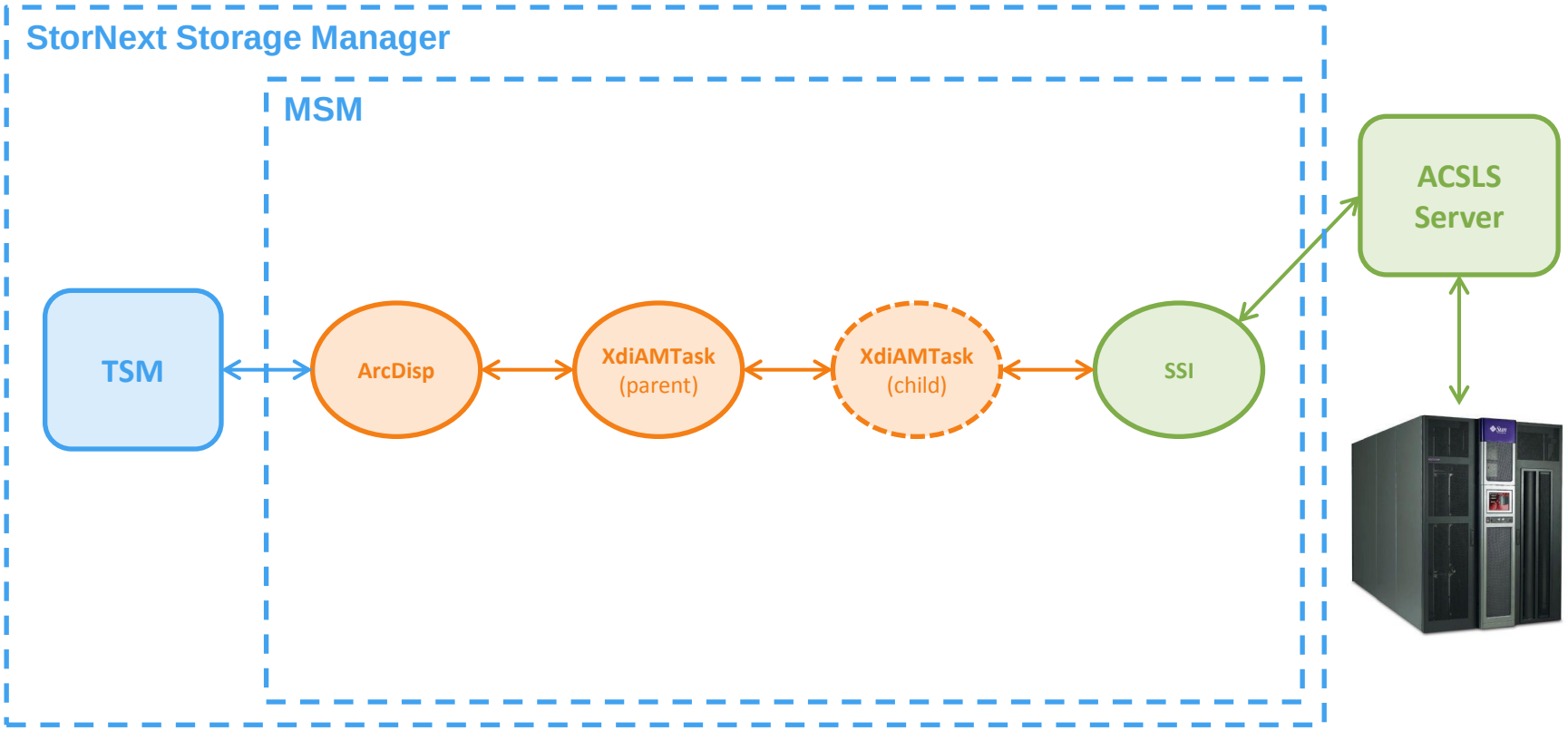
Background

- StorNext customers report underutilization of robots in their ACSLS SL8500 libraries
- HBO, Danish Broadcasting
- Bug 35871 / SRs 1336560, 1390454

Analysis

- Analysis reveals that XdiAMTask forks one child process at a time for each library command

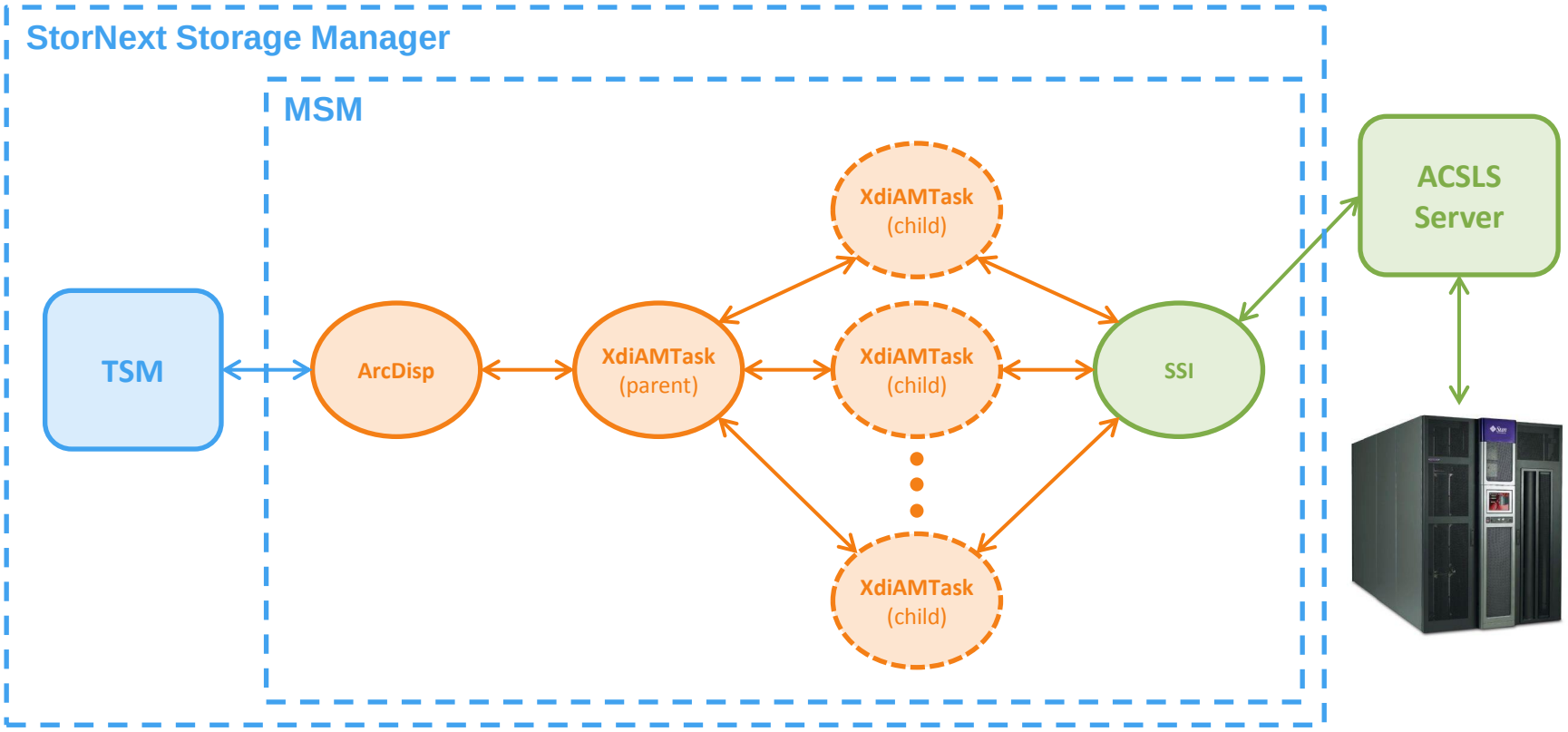


Plan of Action

- Modify XdiAMTask to process concurrent library commands, primarily mounts and dismounts
- Should effect improved utilization of robotics in multi-robot / multi-drive libraries
- Focus on ACSLS libraries but also add preliminary support for SCSI libraries
- Keep library audit commands restricted to one at a time
- Make max number of concurrent library commands configurable

Solution

- XdiAMTask is updated to fork multiple child processes to issue concurrent commands to library



ASC API Challenge

- Oracle supplies the ASC API for a client to interface with the ACSLS server (via the SSI process)
- ACS API creates dedicated socket for communication from a client process to the SSI process
- The Problem: XdiAMTask child processes sometimes received unexpected responses from SSI process due to child inheriting parent's dedicated socket
- Conversion of XdiAMTask to use a threading model with dedicated "listening" thread would take too long to implement
- Instead implemented code changes to remove all use of the ASC API by the parent XdiAMTask
- XdiAMTask child processes now use the ASC API exclusively

Configuration

- New configuration values added to StorNext to limit number of concurrent commands to any single library

```
ACSLS_QUEUE_COUNT   (default 8)
SCSI_QUEUE_COUNT    (default 2)
```

- Configuration values tunable in

```
/usr/adic/MSM/config/envvar.config
```

- Absolute max number of concurrent commands set internally to 12.
- Any configured value greater than 12 will fall back to 12.

Configuration

- Number of concurrent mount and dismount commands is further bounded by the number of configured drives and state of the drives
- StorNext will issue mount commands only up to the number of available drives and queue the rest internally
- StorNext will issue dismount commands only for mounted drives

Performance Tests

- Ran performance tests on an 8-robot 12-drive SL8500
- Each test run issued 44 mount-dismount commands
- Compared mount-dismount execution times running one command at a time vs. running 11 concurrent commands

```
 1 Command at a Time:  2458 secs (40.97 mins)
11 Concurrent Commands: 352 secs (5.87  mins)
```

- 7x performance improvement in our controlled test environment!

Go Quantum!