IML Roadmap and Development Community

Joe Grund

IML Team Lead

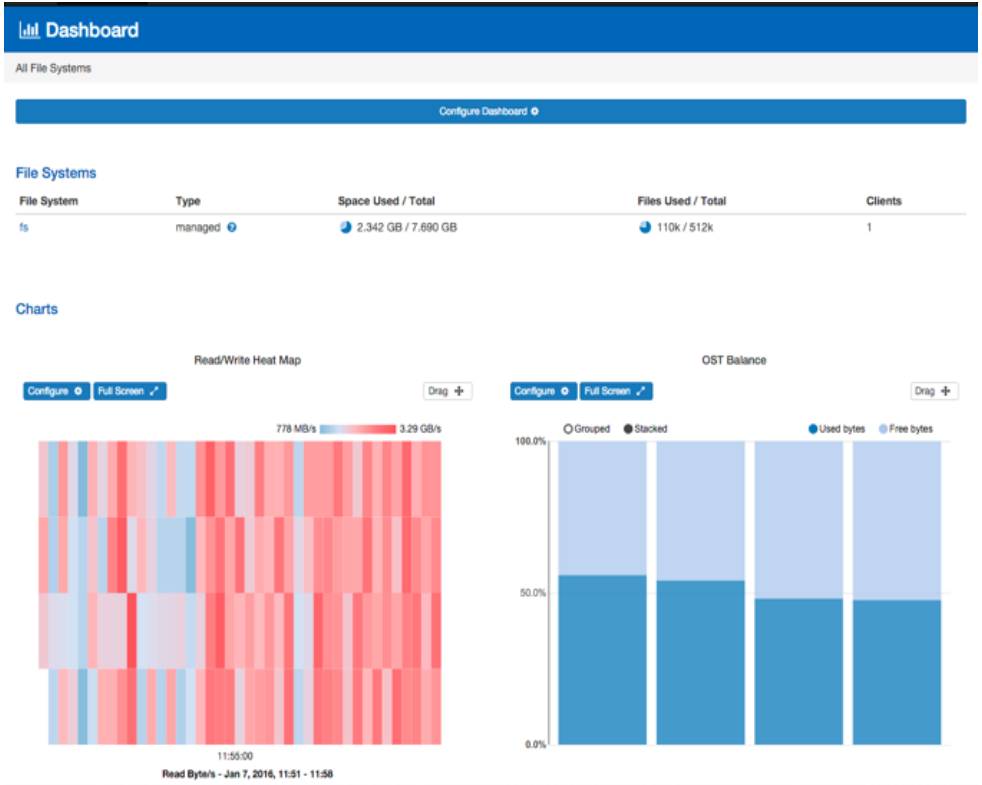
joe.grund@intel.com

Agenda

- IML Background / Overview
- Roadmap
  - 4.1 Release
  - 4.x Series
- Contributing to IML

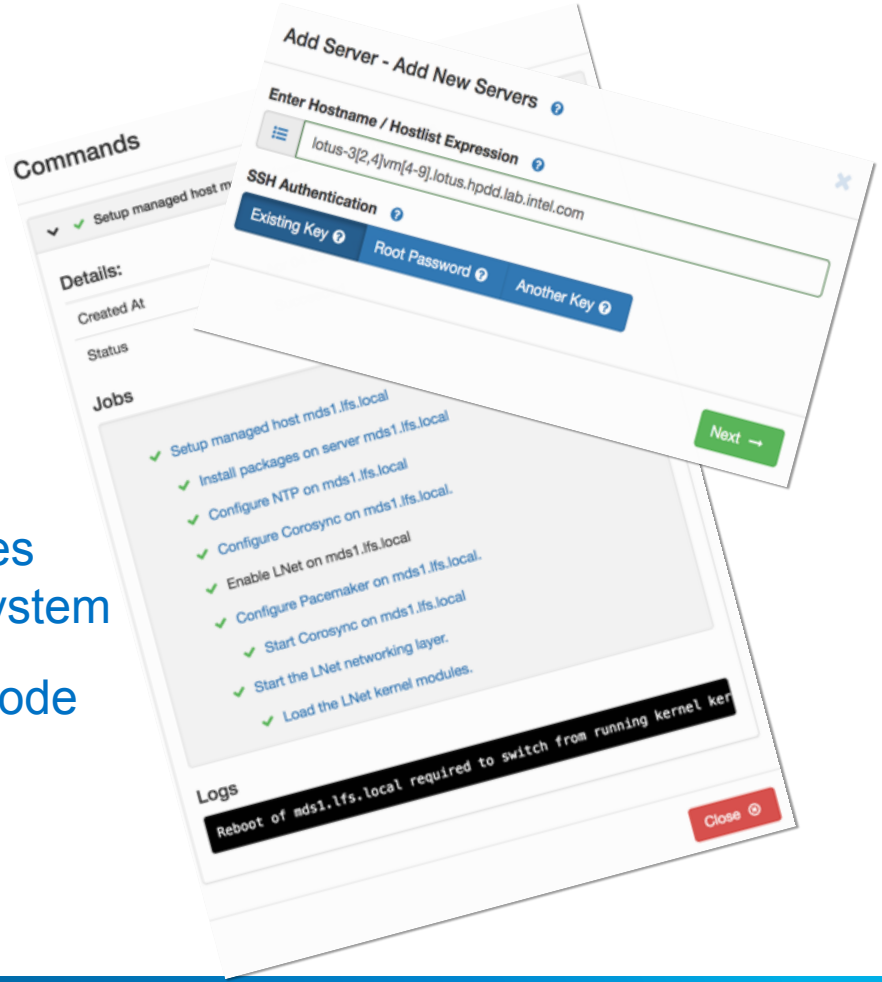
Background

- Intel® Manager for Lustre (IML) is an open source suite of tools for deploying, managing, and monitoring Lustre
- IML simplifies Lustre administration with intuitive interfaces and near real-time feedback
- Works with new and existing Lustre installations
- Monitors performance and system health



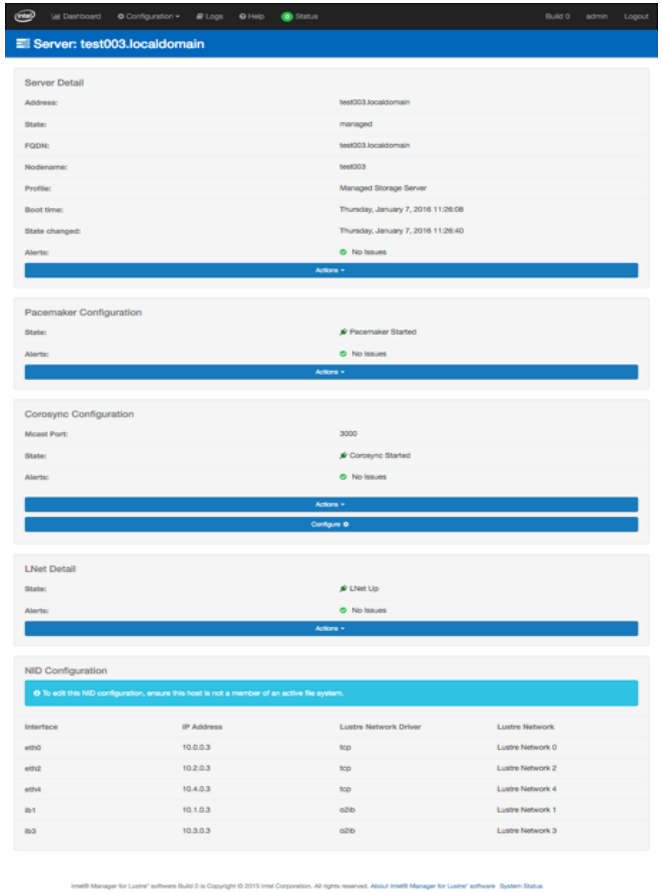
Deployment

- Deploy Lustre filesystems from one centralized location
- Near-realtime feedback
- Bring filesystem online from first principles or deploy monitoring for an existing filesystem
- Deploy specialized assets, HSM agent node
- Add more assets over time



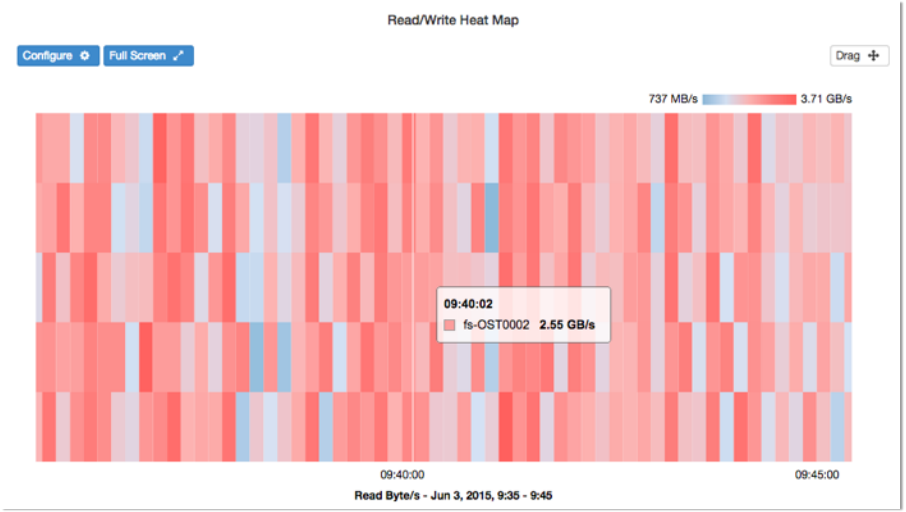
Management

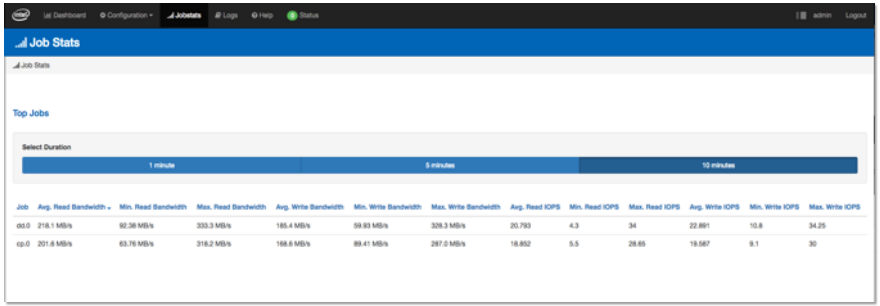
- Configure / change state of Lustre and related components
  - Uses state-machine to reach end state from different starting points
    - Starting LNet, state machine ensures packages are installed + kernel modules loaded before bringing LNet up
- Handle recovery situations fencing, failover
  - Uses Corosync / Pacemaker, with PDUs / IPMI



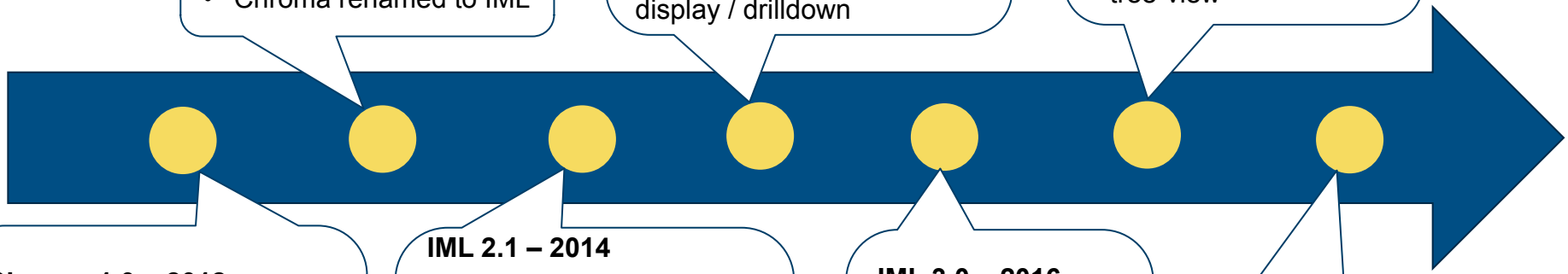
Monitoring

- Holistic system metrics
  - Rich visualizations
  - Drill into filesystem, target, server
  - Find and monitor top jobs
- Aggregate logs across cluster
- HSM Copytool activity monitoring
- Alerts to cluster issues
  - GUI / Email / API
- Searchable command / event / alert log / history





Development History



Chroma 1.0 – 2012

- Bare Metal install
- Start / Stop / Add / Remove FS and targets
- GUI, REST, CLI interfaces
- HA over Lustre targets

IEEL 1.0 – 2013

- Chroma renamed to IML

IML 2.1 – 2014

- Heatmap visualization.
- Job stats collection and display
- Hierarchical Storage Management (HSM) support and display
- Custom profile Support
- Near realtime support

IML 2.2 – 2015

- ZFS Monitored mode support
- Enhanced parallel server deployment
- Enhanced command display / drilldown

IML 3.0 – 2016

- Pacemaker / Corosync config
- NID config
- Queryable status
- Architectural improvements

IML 3.1 - 2016

- ZFS support for managed mode.
- Near realtime jobstats monitoring
- tree-view

IML 4.0 - 2017

- First open source release
- Tracks Lustre LTS
- appliance -> services

Roadmap

4.1 Roadmap (Active Development)

- Increase scalability of device detection
- Increase modularity of components
- Start moving towards separate management / monitoring code paths
- Targeting GA Q2 2018

Scope

- `libzfs` integration
  - https://github.com/intel-hpdd/intel-manager-for-lustre/issues/535
- ZED integration
  - https://github.com/intel-hpdd/intel-manager-for-lustre/issues/536
- Reactive Architecture
  - https://github.com/intel-hpdd/intel-manager-for-lustre/issues/533
- Full Modularity
  - https://github.com/intel-hpdd/intel-manager-for-lustre/issues/534

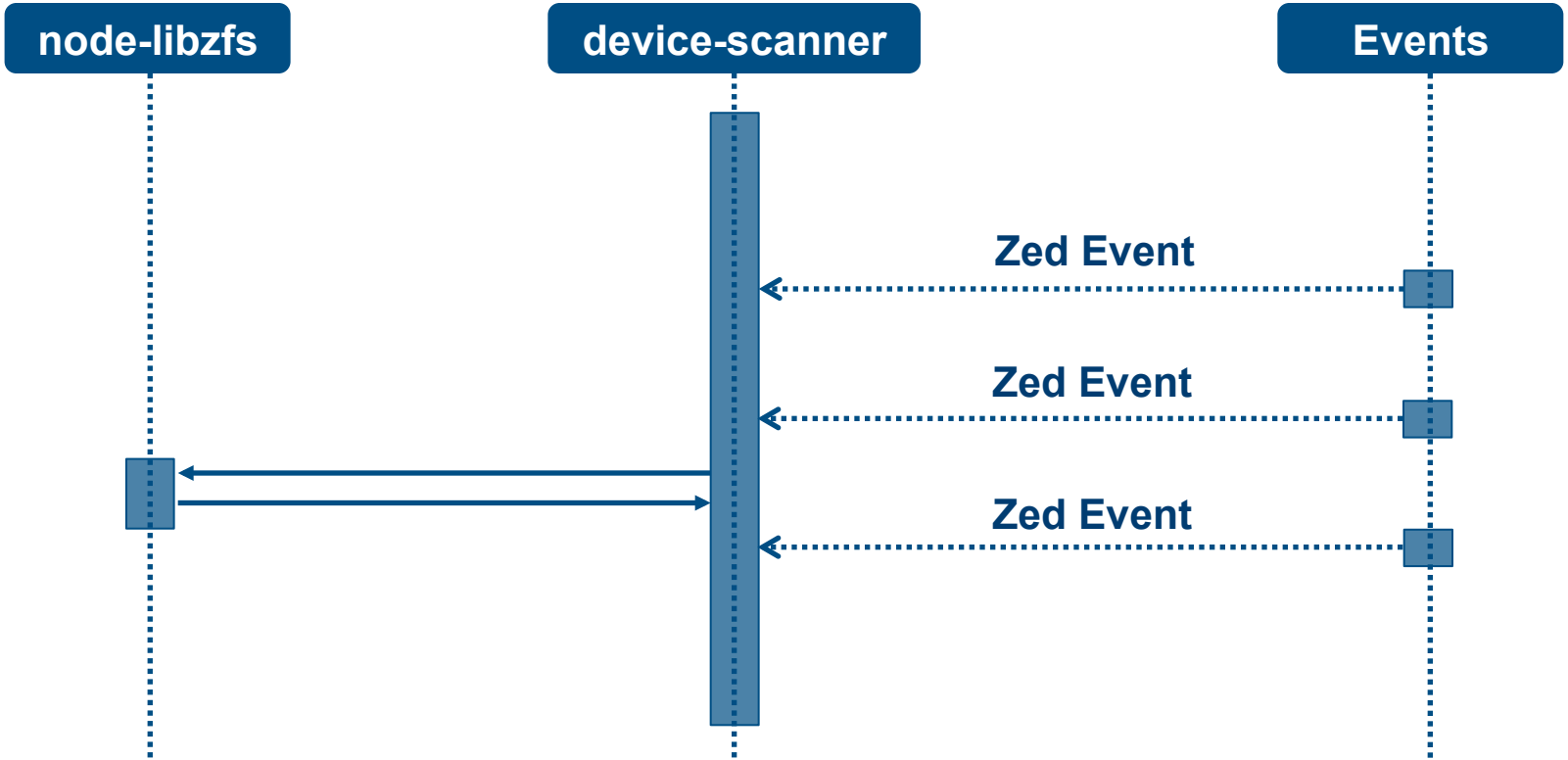
libzfs integration

- IML looking to utilize libzfs in 4.1 release for multiple purposes
  - Lower level interface over invoking commands / parsing CLI output
  - Fine grained collection of pools / datasets / props / VDEV tree
    - easy to collect more data later
  - Useful for monitoring + upcoming management enhancements

ZED Integration

- IML looking to use ZED in 4.1 release for multiple purposes
  - Discovery of pool / dataset / property / VDEV changes
    - This is currently a manual scanning process
    - Will allow for closer to realtime changes to propagate
    - Better scaling
- Surfacing alerts in the IML GUI / API
  - Alerting on critical events across a cluster
  - Searchable history of all events across a cluster

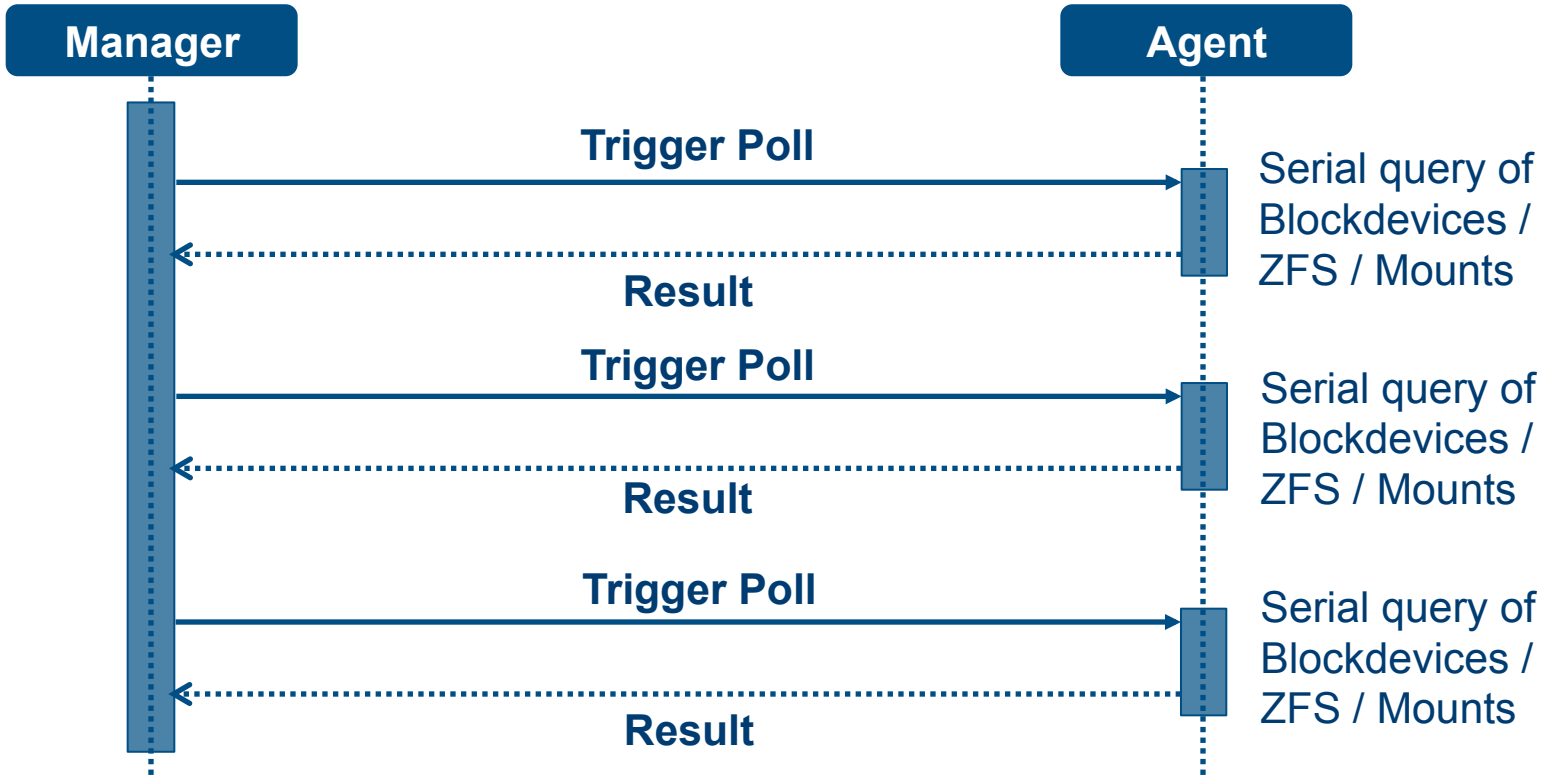
ZED Integration



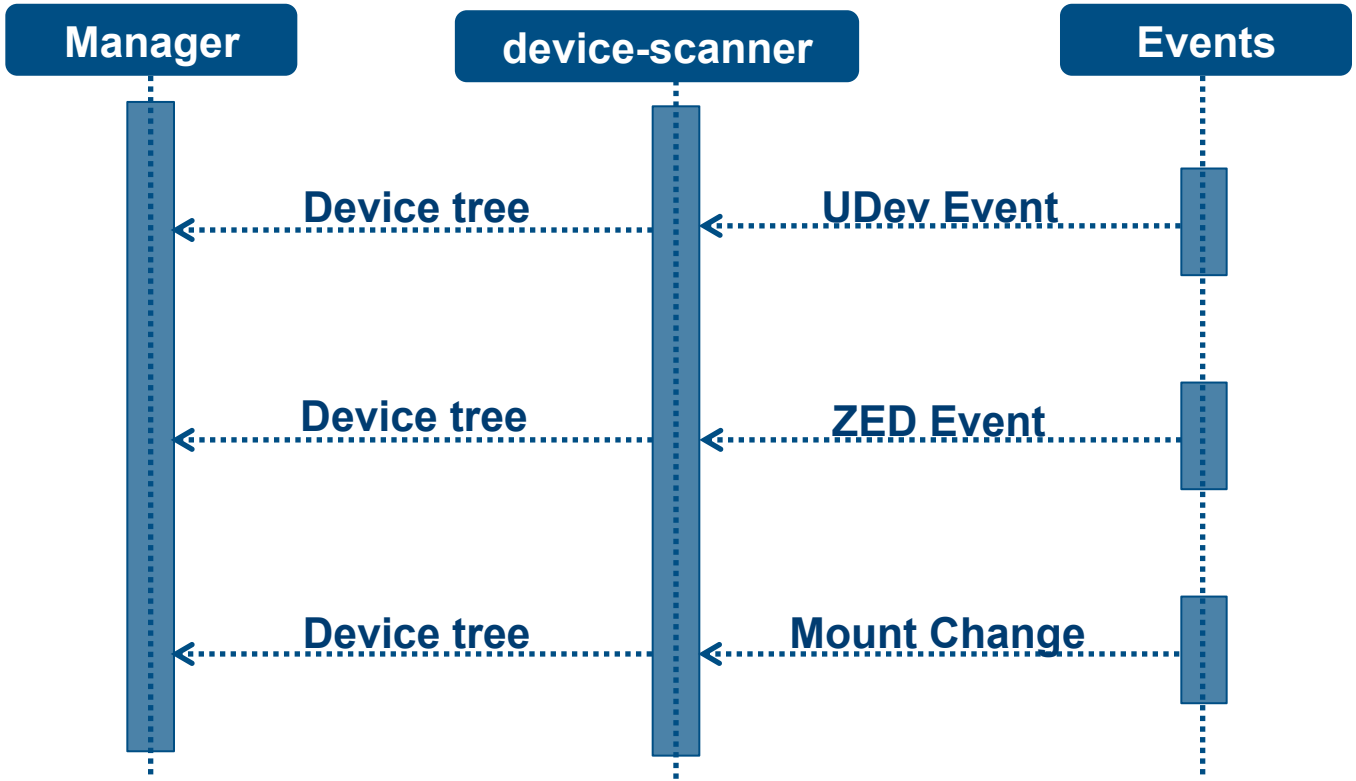
Reactive Architecture

- IML looking to flip device discovery from push to pull
  - Adds further scalability
  - Has lower resource usage
  - More responsive
  - Previous iteration used polling + serial introspection of devices

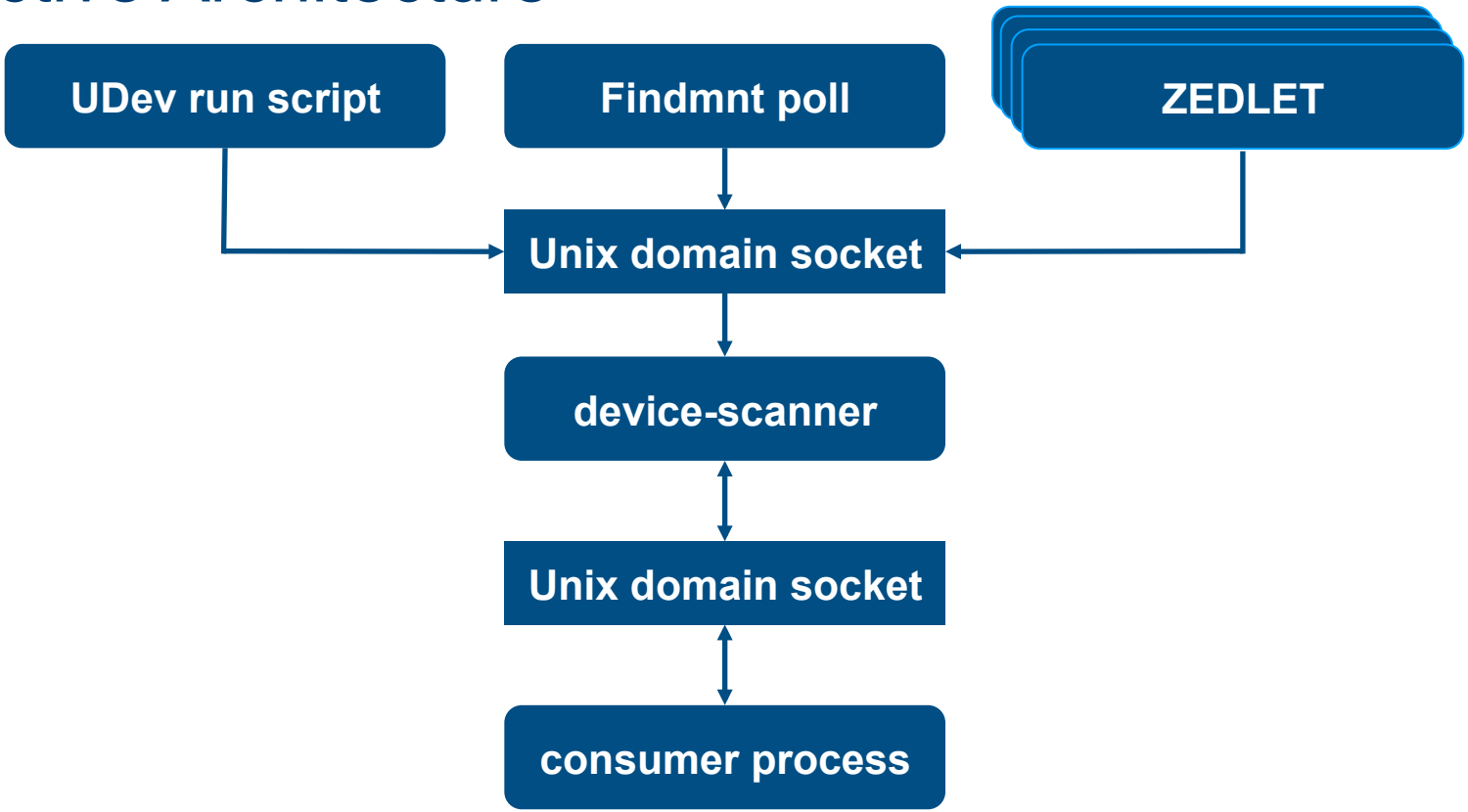
Reactive Architecture



Reactive Architecture



Reactive Architecture



Modularity

- IML looking to deliver itself completely via RPM
  - No more tarball
  - Ship everything via Fedora Copr
- Benefits
  - Semver minor updates via yum update
  - Components evolve independently
- Those not wanting continuous deployment can disable upgrades / perform offline install / upgrade.

4.x Series Roadmap

- Proposed enhancements post 4.1
- Items may be scoped / de-scoped by priority and community feedback
- Prioritize before starting next release
  - IML 4.2 prioritization process to start in coming weeks
- Target quarterly IML enhancement releases
- As needed compatibility + bugfix releases

Enhanced Deployment

- IML should make it even easier to setup Lustre
  - Deploy to large scale clusters with minimal operator intervention
    - Describe ideal cluster state
    - Expose variants as scalable UI widgets
    - Deploy installation in parallel with a single click

Timeseries DB

- IML Should make it easy for users to consume + display stats
  - Use a popular TSDB to collect stats
    - Enable well known API + integration into 3rd party dashboards
    - Better perf / ability to locate stats separately from main db

Use Database Change Events

- IML should use database change events
  - Reduce overhead
  - Push at manager layer
  - Eliminate long-polling, use change events at DB level

Deprecate Storage Plugin

- IML should support more storage arrays as first class citizens
  - Bring functionality in-house for well known plugins
  - Simplify architecture significantly
  - Tightly integrate storage arrays into all of IML

Hardware Data at rest encryption key management

- IML should allow use of hardware encryption across cluster
  - Allow user to encrypt / decrypt all drives or just subset
  - Ability to store pins in a decentralized store
  - Ability to share encrypted pins between nodes for redundancy + HA

Lustre Snapshot Management

IML should be able to manage Lustre snapshots via GUI

- Schedule snapshots for filesystems at some regular interval
- Ad-hoc snapshot on filesystem(s)
- View / delete previous snapshots
- Rollback to a given snapshot
- Rename a snapshot
- Take snapshot at key points (i.e. Lustre upgrade)

Full ZFS Management

- IML should provide full ZFS management
  - Show the list of all pools and datasets
  - Provide drill-down navigation to elicit more detail on a selected target
  - Show the status of pools and datasets
    - Where imported, mounted, error conditions, configuration
  - Management
    - Create zpools / datasets
    - Update volume display to easily setup devices, e.g. RAID-Z
    - JBOD enclosure GUI

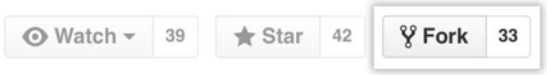
I18n Support

- IML should have an easy facility for i18n
  - IML text currently English, but IML is used all over the world
  - Need a way to support non-native English speakers
    - Ideally in a way that allows end-user contribution/translation
      - Modify/contribute `*.po` files consumed by services
  - Help Wanted!

Contributing to IML

How to get started - Contributing

1. Signup for github.com account if you don't have one
2. Navigate to the repo you are interested in under our organization https://github.com/intel-hpdd/
3. Fork the repo to your personal Github



4. Clone the desired repository locally

```
git clone git@github.com:my-user/GUI.git
```

How to get started - Contributing

5. Set upstream to `intel-hpdd` repo

```
git remote add upstream git@github.com:intel-hpdd/GUI.git
```

6. Create new working branch

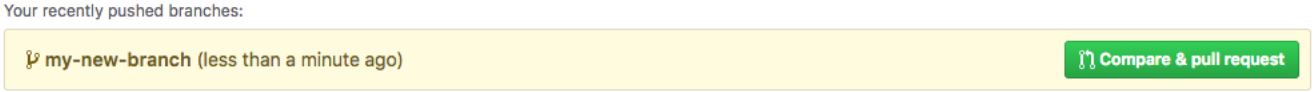
```
git checkout -b my-new-branch
```

7. Make edits, commit + push

```
git commit –s
git push origin my-new-branch
```

How to get started - Contributing

8. Visit your repo in Github GUI, click pull request button



9. Checks will run against CI provider
10. Organization members review, request changes or land

Help Wanted

- Check Github issues for help wanted opportunities
  - https://github.com/issues?utf8=%E2%9C%93&q=is%3Aopen+is%3Aissue+archived%3Afalse+user%3Aintel-hpdd+label%3A%22help+wanted%22
  - Easy to implement, team guidance
- Open an issue / submit a PR
  - Use a release train model, pull in work once it's done
  - Want your feedback on useful enhancements
  - Milestones are public
    - https://github.com/intel-hpdd/intel-manager-for-lustre/milestones

Get in Touch

- Many ways to reach out
  - Join us on gitter.im for any questions
    - https://gitter.im/intel-hpdd/intel-manager-for-lustre
  - Request any issues / enhancements on the IML Repo
    - https://github.com/intel-hpdd/intel-manager-for-lustre/issues/new
  - Checkout our docs
    - https://intel-hpdd.github.io/Online-Help/
  - We have extensive docs on contributing
    - https://intel-hpdd.github.io/Online-Help/docs/Contributor_Docs/cd_TOC.html

Closing

- IML is a project with a long history and continues advancing
  - IML 4.0 was first open source release in Oct 2017
  - Five maintenance updates to 4.0 release
  - IML 4.1 targeted for Q2 2018
  - IML 4.2, next release; prioritization shortly
- We are actively seeking contributors
  - Open tickets or PRs for enhancements / bugfixes
  - Get involved in IML's future!

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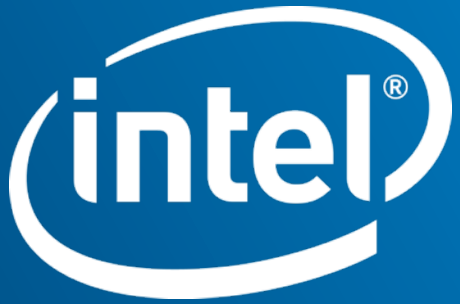
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