TVM & THE APACHE SOFTWARE FOUNDATION

MARKUS WEIMER

MEMBER, APACHE SOFTWARE FOUNDATION

ARCHITECT, MICROSOFT ML PLATFORM

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Why I am here

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Why I am here

Pays me to be here

MARKUS WHO?

- Newcomer to TVM ☺️
- ML researcher and developer, worked on
  - CofiRank
  - Data Parallel SGD
  - Apache REEF
  - ML.NET
- Member of the Apache Software Foundation
  - Inaugural PMC Chair for REEF
  - Mentor for mxnet, HiveMall, Nemo

Here to help the TVM community get into The Apache Software Foundation

Intro about the ASF

The Apache Way

Community choices

Next steps

AGENDA

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THE APACHE SOFTWARE FOUNDATION

Open.

The Apache Software Foundation provides support for the Apache Community of open-source software projects, which provide software products for the public good.

Innovation.

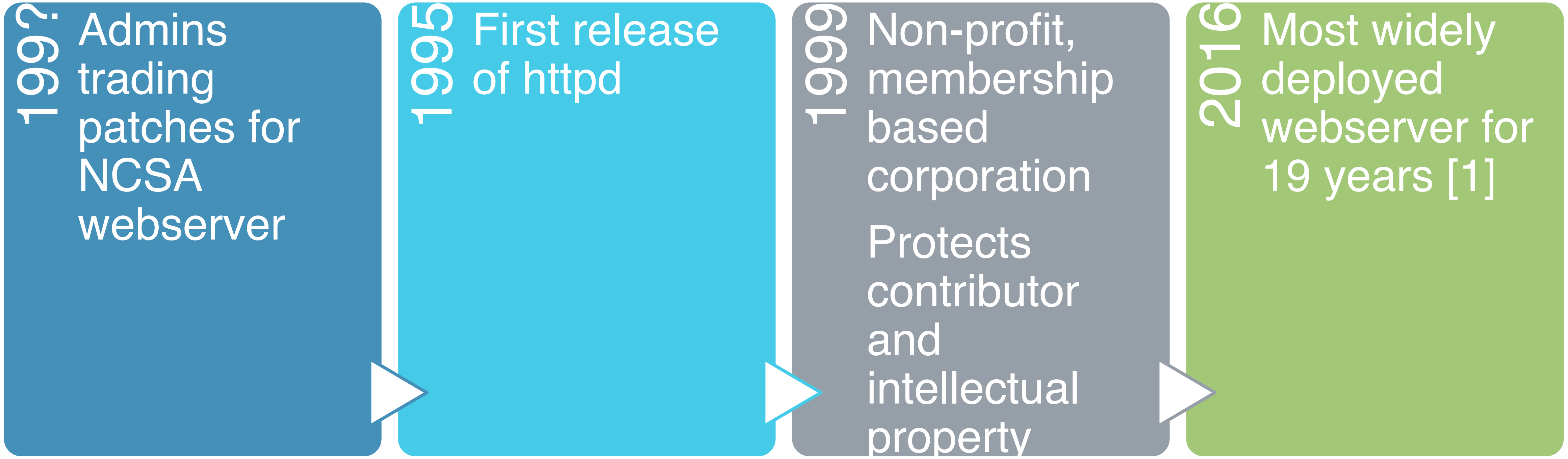
The Apache projects are defined by collaborative consensus based processes, an open, pragmatic software license and a desire to create high quality software that leads the way in its field.

Community.

We consider ourselves not simply a group of projects sharing a server, but rather a community of developers and users.

Source: https://www.apache.org/

HISTORY: APACHE HTTPD



1992? Admins trading patches for NCSA webserver

1995 First release of httpd

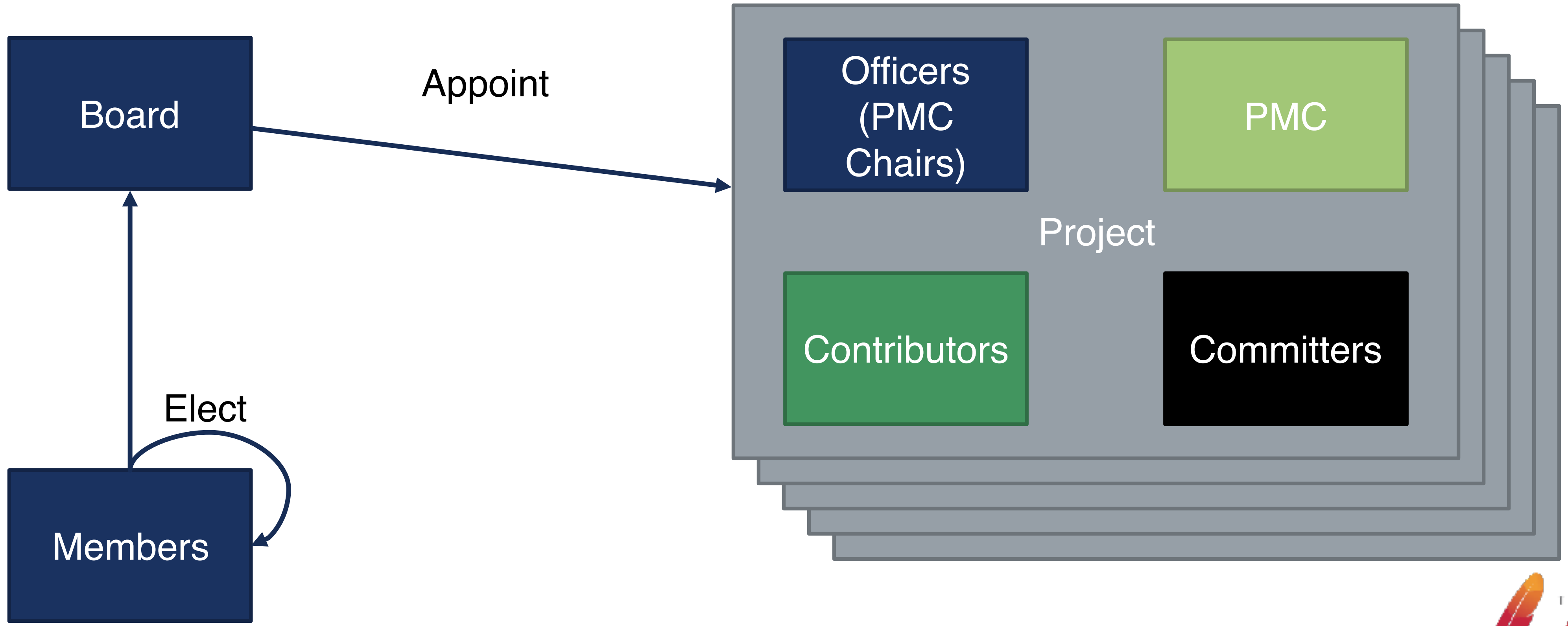
1999 Non-profit, membership based corporation

Protects contributor and intellectual property

2016 Most widely deployed webserver for 19 years [1]

[1] http://news.netcraft.com/archives/2016/04/21/april-2016-web-server-survey.html

WHAT IS THE ASF? -- A NON-PROFIT COOPERATION



Source for the numbers: `http://www.infoworld.com/article/3079813/open-source-tools/the-apache-foundations-incredible-rise.html`

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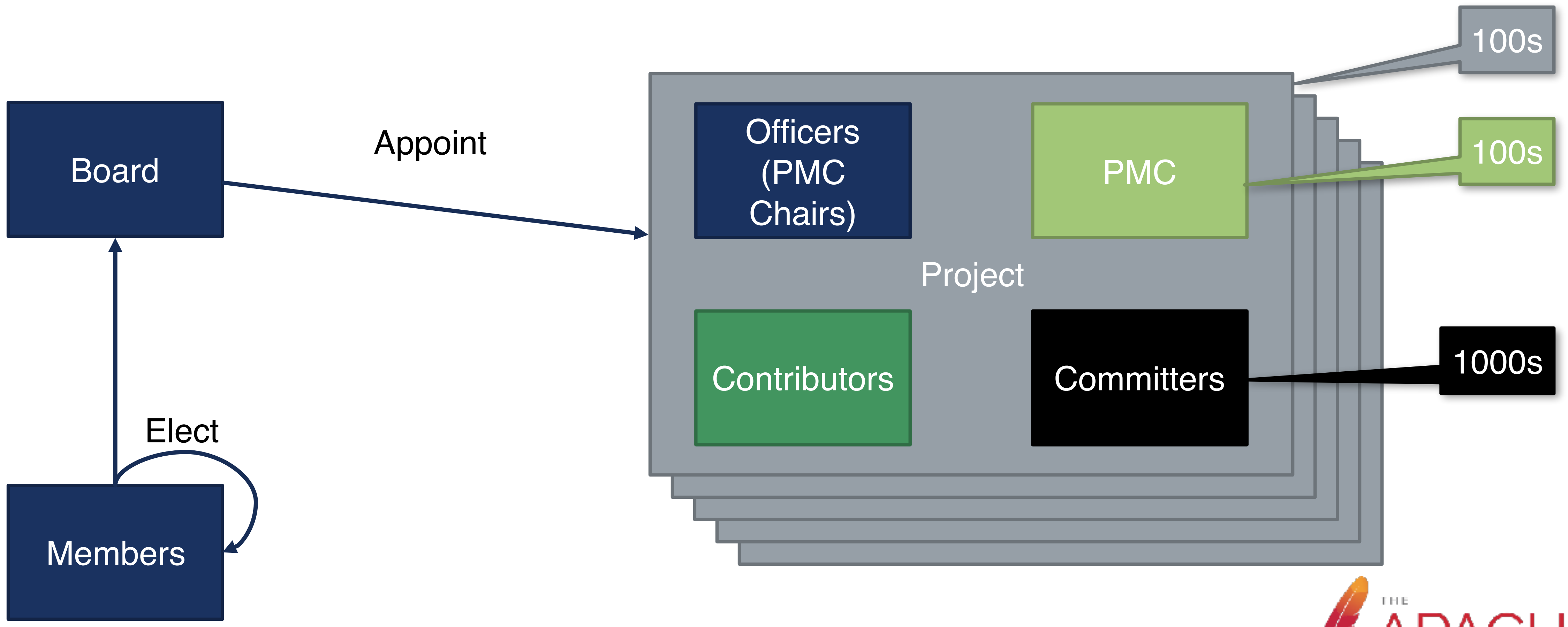

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PROJECT LIFECYCLE

Incubatio
n

- Curriculum to learn responsibilities/procedures necessary to protect foundation: Diverse community, accept new contributors, develop “in the open”
- Searching for a purpose and a role in the ecosystem.

Mature

- More users/legacy/visibility
- Massive ego; “conquered the web”, etc.
- Propose new abstraction/interface, rather than deep changes to core function

Attic

- Project retirement stage
- Code still available, may be “complete”, but community has moved on

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CORE PRINCIPLES

- Collaborative software development
- Respectful, honest, technical-based interaction
- Consistently high quality software
- Commercial-friendly standard license
- Faithful implementation of standards
- Security as a mandatory feature

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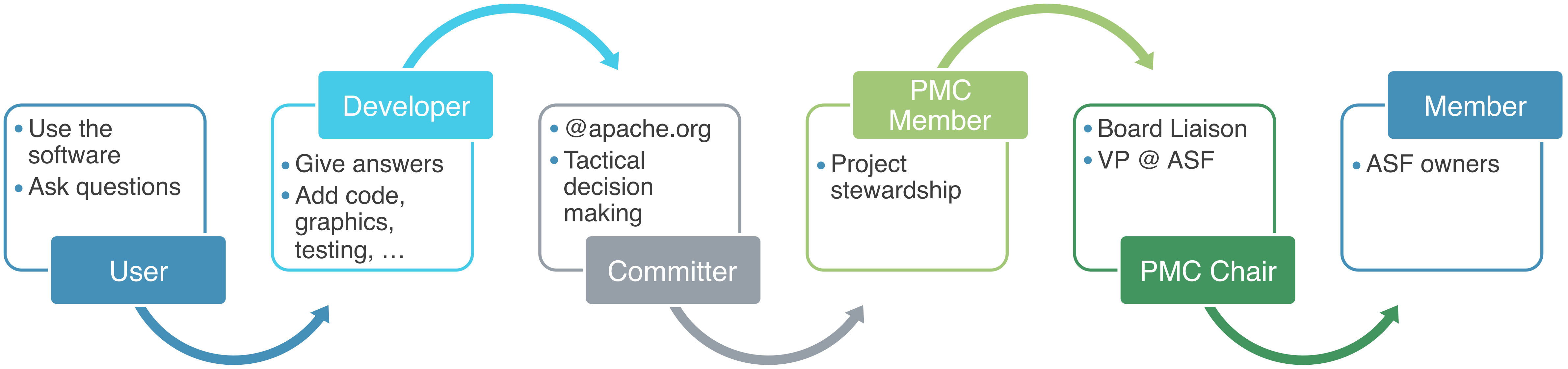
$\left.\begin{array}{l}\text{Collaborative software development}\\ \text{Respectful, honest, technical-based interaction}\end{array}\right\}$ Community over code

MERITOCRACY AND ROLES



MERITOCRACY AND ROLES

AUTHORITY IN APACHE

Be easy to work with	Don’t be a sycophant Disagree respectfully Focus on the technical details
Implied, occasionally explicit aversion to “leaders”	Roles are responsibilities; authority necessary to perform function e.g., releases are lock-free; a struggling RM can (should) be preempted Leads rotate, authority partitioned to subdomains

Explicit consensus

- Releases, new committers / PMCs, rules changes, …
- `[DISCUSS]`, `[VOTE]`, `[VOTE][RESULT]` email threads

Implicit consensus

- Code changes, documentation, …
- Given by absence of veto

Veto powers

- Every committer has veto powers against code changes based on technical reasons
- Pro tip: never argue whether the reasons are technical

CONSENSUS DRIVEN DEVELOPMENT

VOTING

- `+1:` I want this to happen
- `+0:` Meh
- `-0:` Ewh, really?
- `-1:` No way. Veto (where possible)

- Binding: The vote counts
  - E.g. PMC votes on release (majority vote)
- Non-binding
  - E.g. User votes in a release

Voting should be relatively rare. The goal is that the project proceeds by **consensus**, and its members negotiate outcomes with one another. The votes `(+1,-1, …)` are sometimes used in discussions to express opinions outside of a `[VOTE]` thread.

As public as possible:

`user@`	for usage questions
`dev@`	for development discussion
`private@`	for personal and legal matters

Easy to search and archive

E-Mails follow RFC 3676

Plain text, Markdown where needed

Quoting with `>`

COMMUNICATIONS

“If it didn’t happen on the mailing list,

it didn’t happen”

THE APACHE® SOFTWARE FOUNDATION

LESSON: THE APACHE PROCESS LEADS TO BETTER SOFTWARE

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LESSON: THE APACHE PROCESS LEADS TO BETTER SOFTWARE

"If it isn't on the mailing list, it didn't happen"

- The bad:
  - Higher latency per issue: Discussing things over email takes longer
  - This can be trained and gets get better over time.

LESSON: THE APACHE PROCESS LEADS TO BETTER SOFTWARE

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  - Documents the decision process, not just the outcome
  - Every developer (even the shy ones) have equal influence.

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  - Documents the decision process, not just the outcome
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- The phenomenal:
  - Quality goes up (code as well as discussion becomes part of your CV)
  - Throughput goes up (less blockage, uncertainty)

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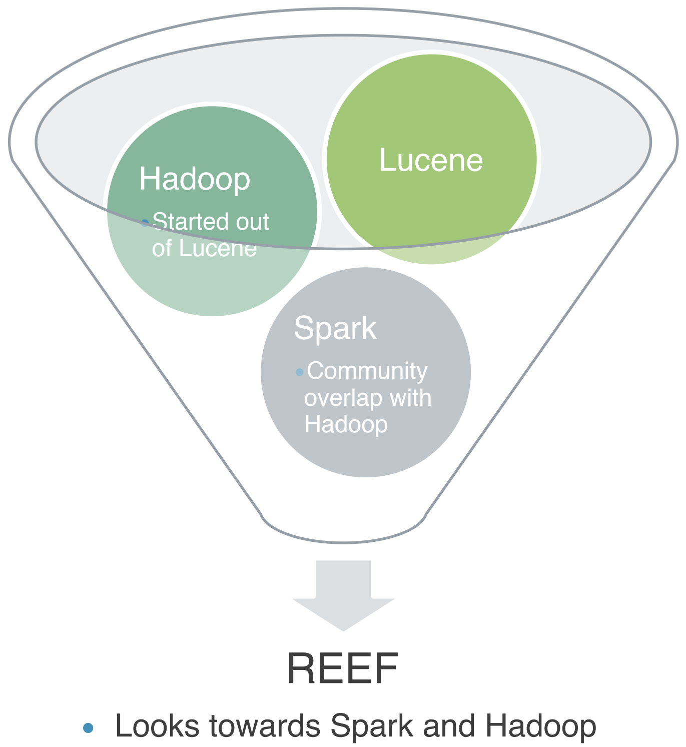
PROCESS HISTORY

- As communities form, they make their own rules
- In practice, people copy / merge the rules from past projects
- REEF copied from Spark and Hadoop, which in turn spawned from Lucene



CTR VS. RTC

CTR VS. RTC

Commit then review (CTR)

- Every committer does the code changes they see fit.
- Other committers review and undo changes.

- Stabilization happens during release.
- Messy commit log

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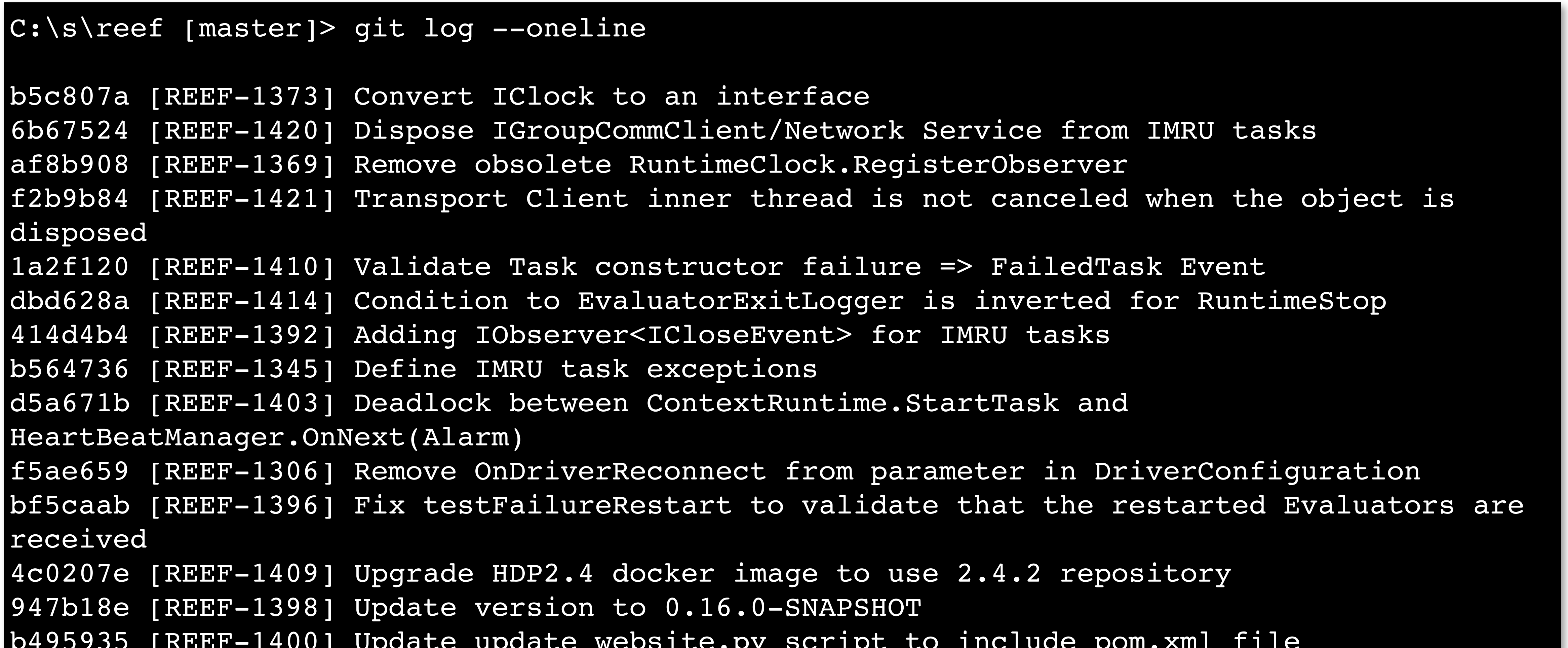
Review then commit (RTC)

- Every change is reviewed by another committer.
- Every change is merged by another committer.

- Always releasable software
- Extremely clean commit log

- Used by every Big Data project in Apache

CTR VS. RTC



```
C:\s\reef [master]> git log --oneline

b5c807a [REEF-1373] Convert IClock to an interface
6b67524 [REEF-1420] Dispose IGroupCommClient/Network Service from IMRU tasks
af8b908 [REEF-1369] Remove obsolete RuntimeClock.RegisterObserver
f2b9b84 [REEF-1421] Transport Client inner thread is not canceled when the object is
disposed
1a2f120 [REEF-1410] Validate Task constructor failure => FailedTask Event
dbd628a [REEF-1414] Condition to EvaluatorExitLogger is inverted for RuntimeStop
414d4b4 [REEF-1392] Adding IObserver<ICloseEvent> for IMRU tasks
b564736 [REEF-1345] Define IMRU task exceptions
d5a671b [REEF-1403] Deadlock between ContextRuntime.StartTask and
HeartBeatManager.OnNext(Alarm)
f5ae659 [REEF-1306] Remove OnDriverReconnect from parameter in DriverConfiguration
bf5caab [REEF-1396] Fix testFailureRestart to validate that the restarted Evaluators are
received
4c0207e [REEF-1409] Upgrade HDP2.4 docker image to use 2.4.2 repository
947b18e [REEF-1398] Update version to 0.16.0-SNAPSHOT
b495935 [REEF-1400] Update update website.py script to include pom.xml file
```

JIRAS, CODE REVIEWS AND COMMITS

- Design discussions happen on JIRA (yay!)
  - People are comfortable and encourage many open JIRAs
  - Example [MapReduce-279] (YARN) was open for 3.5 years.
  - Often, the committer closes issue (2nd best option)
- Code reviews happen on GitHub
- Commit messages link back to both.
  - Committer who does the merge also rebases to current `master`
  - Commits are squashed to create a linear commit history
  - "True history" is preserved on GitHub

COMMIT MESSAGES

- Valid Markdown
- Link to JIRA
- Link to Pull Request
- Useful one-line summar

```
[REEF-1410] Validate Task constructor failure => FailedTask
Event

This addressed the issue by
  * Fixing heartbeat failure if task fails to start.
  * Adding a test to verify Task failure message.

JIRA:
  [REEF-1410](https://issues.apache.org/jira/browse/
REEF-1410)

Pull Request:
  This closes #1019
```

RELEASE MANAGER CREATES A BRANCH, BEGS FOR HELP

MAJORITY OF PMC VOTES, BECOMES THE NEXT RELEASE (FOUNDATION RULE)

VERSION ASSIGNED DURING THE VOTE

RELEASES

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NEXT STEPS

WRITE A PROPOSAL

FORM AN INITIAL PMC AND COMMITTER GROUP

SEND THE PROPOSAL TO THE APACHE INCUBATOR

THANKS FOR YOUR TIME!

- weimer@apache.org
- Markus.Weimer@Microsoft.com
- @markusweimer
- http://markusweimer.com

RESOURCES

- https://www.apache.org/foundation/how-it-works.html
- https://wiki.apache.org/hadoop/HowToContribute
- https://wiki.apache.org/hadoop/HowToCommit
- http://www.catb.org/~esr/faqs/smart-questions.html
- https://issues.apache.org/jira/browse/HADOOP (YARN/MAPREDUCE/HDFS/...)
- http://producingoss.com/ (Karl Fogel, Subversion)
- http://www.infoworld.com/article/3079813/open-source-tools/the-apache-foundations-incredible-rise.html