

CHRIS A. MATTMANN

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PRIMARY RESEARCH OR PRACTICE AREA(S):

- BIG DATA/DATA SCIENCE
- OPEN SOURCE
- REMOTE SENSING OF THE EARTH

PREVIOUS EXPERIENCE (IF RELATED TO WORKSHOP FOCUS)

- ONE OF THE ORIGINAL DEVELOPERS OF NUTCH, HADOOP, LUCENE/SOLR, TIKA
- BROUGHT NASA'S FIRST PROJECT, OODT, TO THE ASF

RELATED WORK (PROJECTS SPECIFIC TO WORKSHOP WITH WEB-SITES)

- [HTTP://OODT.APACHE.ORG](http://oodt.apache.org)

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SURVEY OF COMMONALITY WITH OTHER DISCIPLINES
WORKSHOP 2 - JULY 25, 2013
INDIANAPOLIS, INDIANA

Developing Open Source Software for NASA

Chris A. Mattmann
Senior Computer Scientist, NASA
Adjunct Assistant Professor, USC
Member, Apache Software Foundation

And you are?



- Senior Computer Scientist at NASA JPL in Pasadena, CA USA
- Software Architecture/ Engineering Prof at Univ. of Southern California

Credit: Daniel Goode, JPL/Caltech

- Apache Board of Directors/Member involved in
 - OODT (PMC), Tika (PMC), Nutch (PMC), Incubator (PMC), SIS (PMC), Gora (PMC), Airavata (PMC), cTAKES (PMC), Any23 (PMC)

Some projects I work on



U.S. National Climate Assessment
(pic credit: Dr. Tom Painter)



SKA South Africa: Square Kilometre Array
(pic credit: Dr. Jasper Horrell, Simon Ratcliffe)

What most people do



Credit : <http://goo.gl/h1Adj>



Credit : Universal Pictures, Amblin Entertainment

What I'm interested in doing

- Leveraging massive amounts of developers all over the world



- Being part of something “bigger” Credit: <http://goo.gl/pjwBW>

But what about?

- NASA FAR Supplement
- NPR 2210.1C
- My center's interests?
- What my project manager told me?
- What someone in the next cube told me?

But what about?



...you think that's *air* you're breathing?

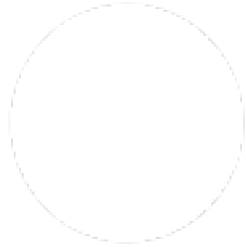
25-Jul-13

DASPOS-JDCL13

Credit: Warner Bros. Pictures,
Warner Bros. Pictures, Village
Roadshow Pictures

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My “simplified” version



Key: The duration of each arrow and step can vary, which is generally what makes people NOT believe this is possible.

Don't go it alone



Community building

Get social

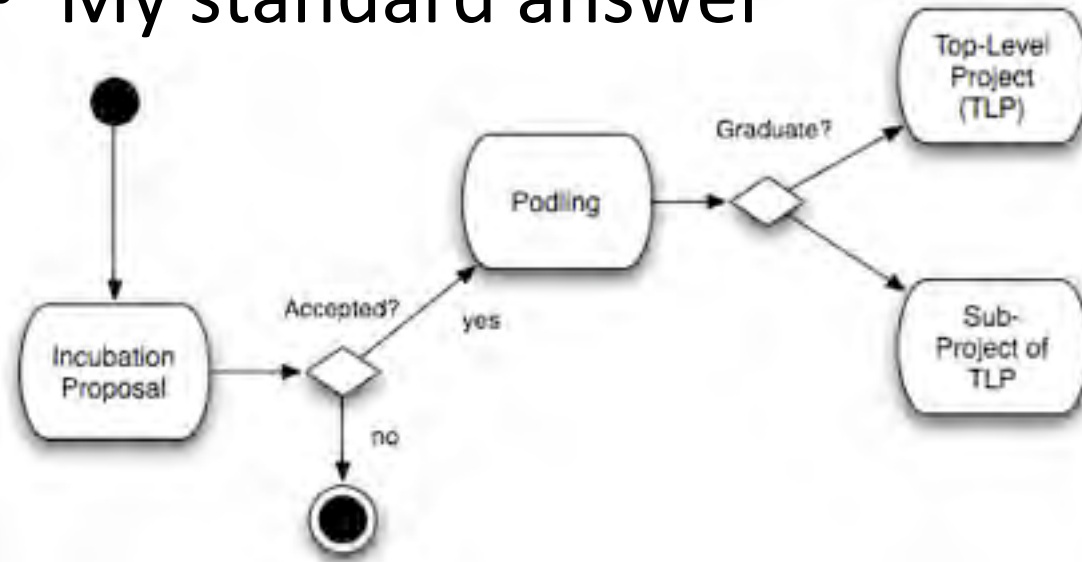
No one organization controls
the software

Gain merit, earn the commit bit,
guide the software to its fruition

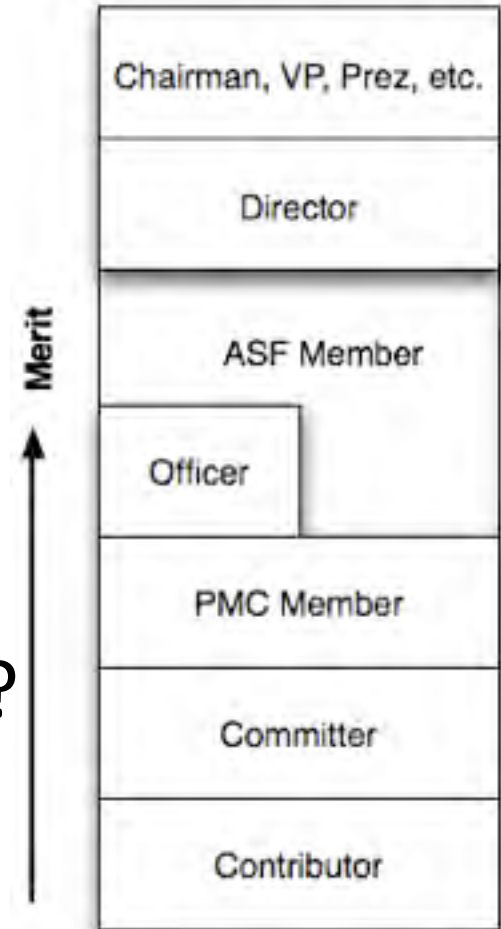


So you want to start _____ Software

- My standard answer



Why wouldn't Apache work for us?



Worried about loss of “control”?



Community
over
code
equals
TheApacheWay

Three +I's is what it's all about

25-Jul-13

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What that loss of control buys my

- “Hit the Ground Running, Day 1”
- Work done upfront for modern, agile software release and infrastructure support
- Sustainability and Diversity
- Notoriety
- R-E-S-P-E-C-T

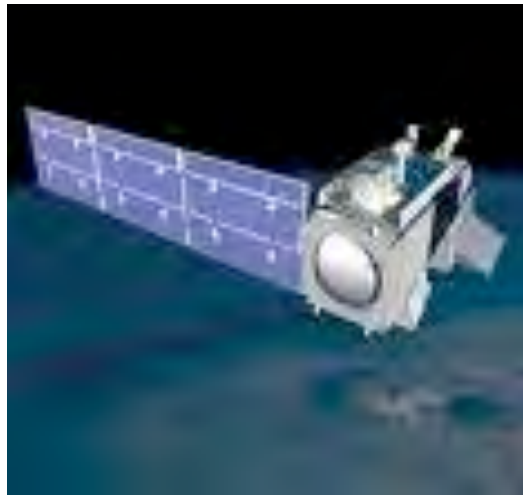


This wouldn't work for MY mission

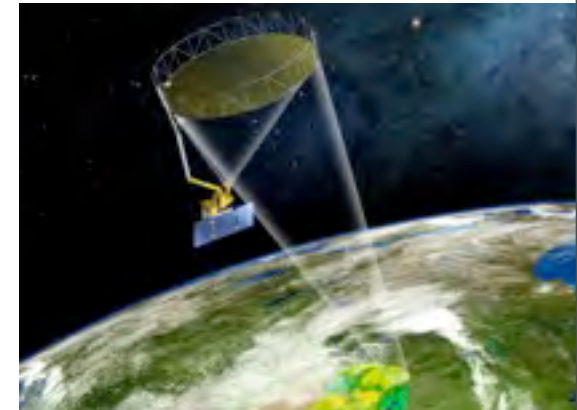
- It already has



Credit: OCO 1/2 and ACOS Team



Credit: NPP Team



Credit: SMAP team

Because of this: Apache OODT

- Entered “incubation” at the Apache Software Foundation in 2010
- Selected as a top level Apache Software Foundation project in January 2011
- Developed by a community of participants from many companies, universities, and organizations over the last decade with 100s of FTEs of investment
- Used for a diverse set of science data system activities in planetary science, earth science, radio astronomy, biomedicine, astrophysics, and more



OODT Development & user community includes:



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What Apache OODT lets us do

- *How do we handle 700 TB/sec of data coming off the wire when we actually have to keep it around?*
 - Required by the Square Kilometre Array
- *Joe scientist says I've got an IDL or Matlab algorithm that I will not change and I need to run it on 10 years of data from the Colorado River Basin and store and disseminate the output products*
 - Required by the Western Snow Hydrology project
- *How do we compare petabytes of climate model output data in a variety of formats (HDF, NetCDF, Grib, etc.) with petabytes of remote sensing data to improve climate models for the next IPCC assessment?*
 - Required by the 5th IPCC assessment and the Earth System Grid and NASA
- *How do we catalog all of NASA's current planetary science data?*
 - Required by the NASA Planetary Data System

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Image Credit: <http://www.jpl.nasa.gov/news/news.cfm?release=2011-295>

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What we're up against as "Govt"



Google

facebook

twitter

VS.



- Our NASA “challenges” are game-changing and unique
 - But we’re not handing out iPad 3s when there is a successful delivery (and if you are, then please speak to me after this talk)
 - So we have to really compete via our challenges

The last thing we want to do

- Is scare off the next generation of SUPER talented engineers



- Open Source and the feeling of working on awesome challenges and at the same time being part of something bigger (“open source”) – now THAT is WIN

This pretty much sums it up

- In a MUCH cooler way than I ever could

www.youtube.com/watch?v=u6XAPnuFjJc

(credit: RSA Animate)

- Here's what we're after:
 - Purpose
 - Mastery
 - Autonomy

From the Ivory Tower

- A few recommendations (if I had it my way)



Pick up a shovel...and help
dig the hole

Consensus not unilateral

- “I know you're out there. I can feel you now. I know that you're afraid. You're afraid of us. You're afraid of change. I don't know the future. I didn't come here to tell you how this is going to end. I came here to tell you how it's going to begin. I'm going to hang up this phone, and then I'm going to show these people what you don't want them to see. I'm going to show them a world ... without you. A world without rules and controls, without borders or boundaries; a world where anything is possible. Where we go from there is a choice I leave to you.”

Credit: http://en.wikiquote.org/wiki/The_Matrix

Disclaimer

- Opinions are my own.
- Being here? WOW.
- Questions?
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 - chris.a.mattmann@nasa.gov