Yahoo's Adventure with ATS

Presented For The Apache Foundation By
LINUX FOUNDATION

Who are we?

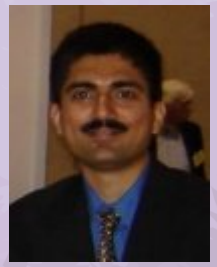
APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

Kit Chan

- Principal Engineer @ Yahoo
- Working in Media group
- Apache Traffic Server Committer

Vijay Prashanth Hosahithlu

- Product Manager @Yahoo
- Working in Edge Services group



Presented For The Apache Foundation By
LINUX FOUNDATION

http://www.strongchurch.org/wp-content/uploads/2013/06/corkscrew.jpg

1998 - 2002

History - Inktomi

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

- TS 2.0 - 1998, 3.0 - 1999, 4.0 - 2000
- Customers - AOL, @Home
- Interesting Use Case - Transcoding images to smaller sizes for AOL dialup users

Presented For The Apache Foundation By
LINUX FOUNDATION

2002 - 2010

History - YTS

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

- Inktomi Acquired by Yahoo - late 2002 / early 2003
- Renamed to YTS - Efforts resumed around late 2005
- By Feb 2010, served 30 billion objects, 400 terabytes a day for Yahoo

YAHOO!

Presented For The Apache Foundation By
LINUX FOUNDATION

2009 - 2010

History - ASF

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

- Preparation - 700K lines of code change, 9 Months
- Apache Incubator in July 2009
- TLP in April 21, 2010

Presented For The Apache Foundation By
LINUX FOUNDATION

Improvement Opportunities

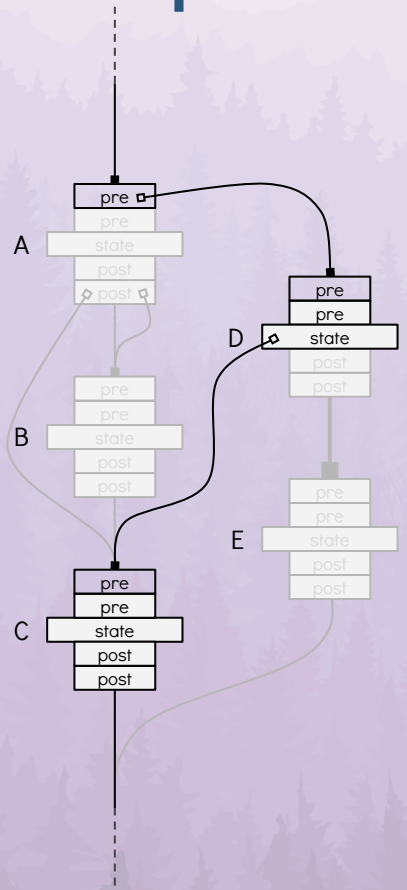
APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

- Performance - concurrent connections
- Long tail latency - lock design
- Extendability on state machine
- Programmability - continuation, asynchronous model, plugin architecture

Presented For The Apache Foundation By
LINUX FOUNDATION

Experiment with Coroutine

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014



- Generalized subroutine allowing multiple entry points
- Context Switch done explicitly by function call and much faster
- Synchronous Programming for Plugins
- Allow lock-free environment

Presented For The Apache Foundation By
LINUX FOUNDATION

2010 - 2013

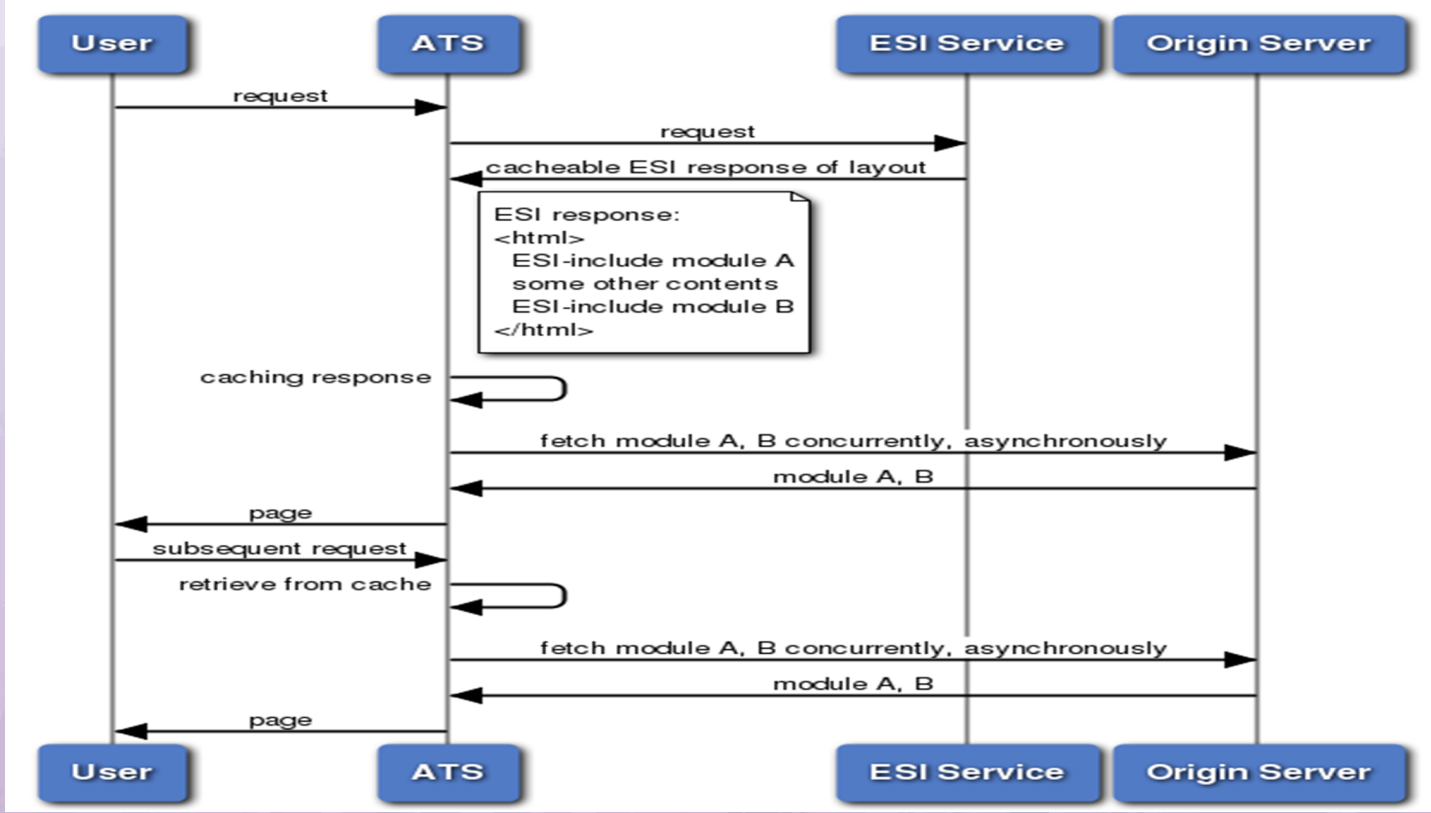
YTS/ATS keeps growing in Yahoo!

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

- 6000+ nodes running YTS, 300+ nodes running ATS
- Varied use cases including reverse proxy, forward proxy; caching; SSL termination; ESI; DoS protection
- Squid, Nginx also with significant use

Presented For The Apache Foundation By
LINUX FOUNDATION

Use Case - ESI

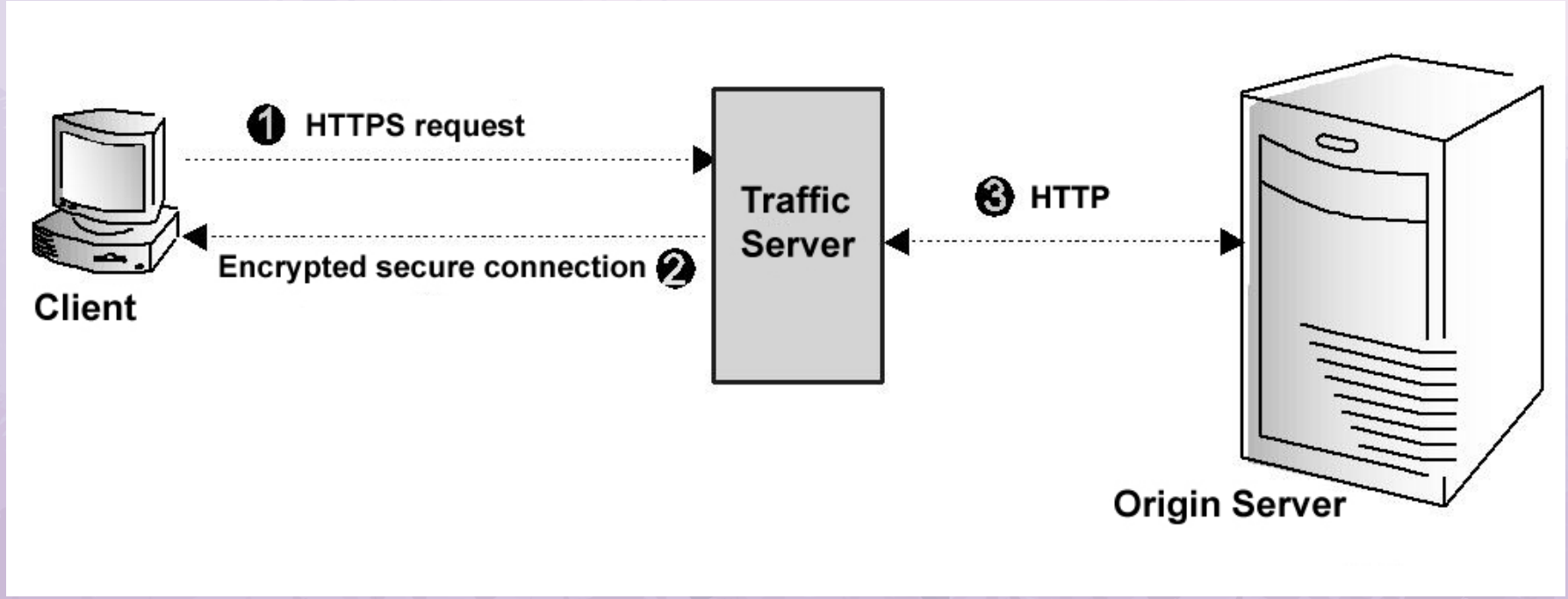


APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

Presented For The Apache Foundation By
LINUX FOUNDATION

Use Case - SSL Termination

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014



http://docs.trafficserver.apache.org/en/latest/_images/ssl_c.jpg

Presented For The Apache Foundation By
LINUX FOUNDATION

2010 - 2014

ATS keeps growing better

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

- Performance improvements: 64-bit, gzip, SSL session tickets
- Stability improvements: Memory management, Custom logging
- Cache enhancements: Clustering, SSD
- Protocol support: Web sockets, NPN, SPDY
- Security enhancements: PFS, HSTS

Presented For The Apache Foundation By
LINUX FOUNDATION

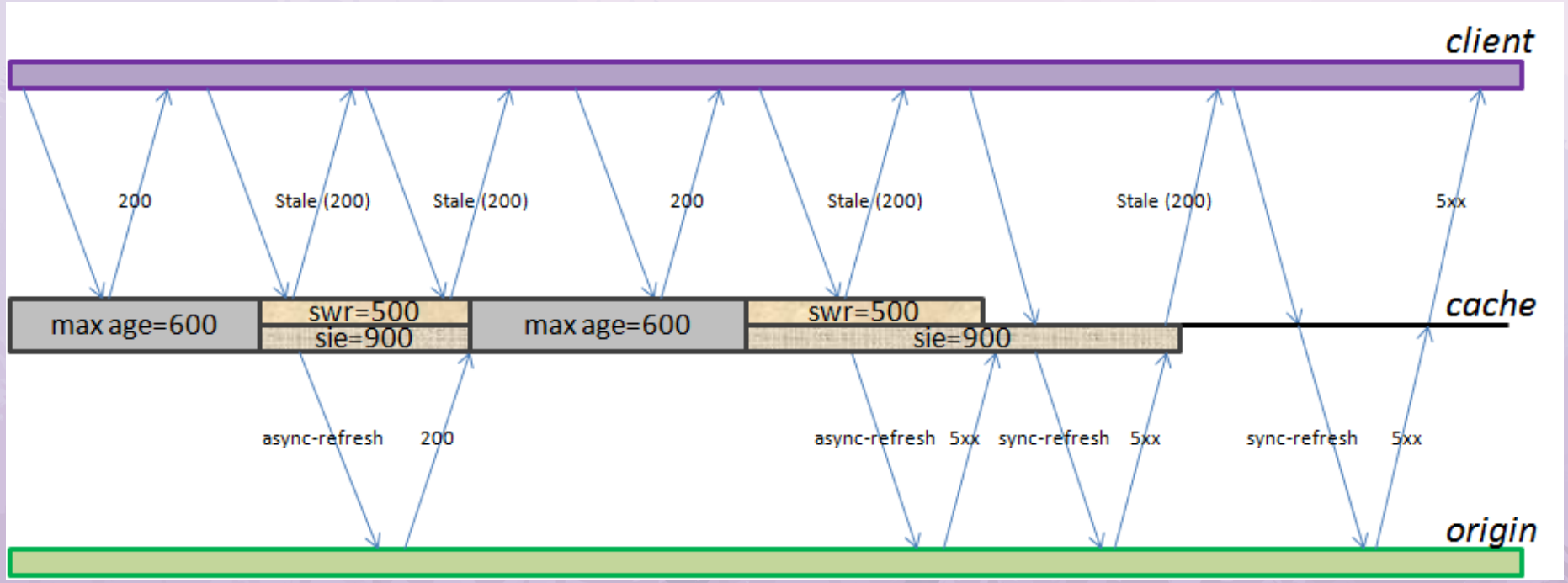
YTS/ATS becomes one in Y!

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

- ATS standardized as the recommended caching proxy
- Additional plugins: Stale While Revalidate, Stale If Error, CARP, SSL Session Reuse
- 4500+ nodes running YTS, 9500+ nodes running ATS and growing...

Use Case - SWR, SIE

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014



Presented For The Apache Foundation By
LINUX FOUNDATION

ATS in Yahoo Today

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

- Hosted on thousands of nodes
- Handles hundreds of thousands of requests per second
- Serves hundreds of gigabits per second
- Committers: 2
- Contributors: 6 and growing

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

How should Business work with Open Source Software?

Presented For The Apache Foundation By
LINUX FOUNDATION

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

1) Open Source and Business Challenges & Opportunities

Presented For The Apache Foundation By
LINUX FOUNDATION

Time to Market/Cost of Development

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

http://www.sellbetter.ca/wp-content/uploads/2012/09/time-management.jpg

http://www.todayifoundout.com/wp-content/uploads/2010/02/gold-dollar-sign.jpg

Presented For The Apache Foundation By
LINUX FOUNDATION

https://na.theiia.org/services/quality/PublishingImages/quality-blocks1.png

Innovation

http://innovationpov.com/wp-content/uploads/2011/05/innovationbulb.jpg

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

Presented For The Apache Foundation By
LINUX FOUNDATION

People/Talent

http://avancos-global.com/wp-content/uploads/talent.jpg

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

Presented For The Apache Foundation By
LINUX FOUNDATION

2) Understand the Open Source Culture

http://fmgators.ymcacassclay.org/files/2013/07/Volunteers-Needed-2.jpg

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

Presented For The Apache Foundation By
LINUX FOUNDATION

Continuous/Incremental Improvement

http://thenewtechnologist.files.wordpress.com/2012/10/incremental-innovation.jpg

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

Presented For The Apache Foundation By
LINUX FOUNDATION

Communications

http://pepperltd.com/wp-content/uploads/2014/01/Internal-Communications.jpg

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

Presented For The Apache Foundation By
LINUX FOUNDATION

3) Come up with an approach/strategy on using Open Source in my business

Open Model in adopting with ATS in a big company

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

- Centralized Model
  - Could become bottleneck for organizations with multiple teams using ATS
- Open Model
  - All are encouraged to contribute directly
  - Central team to nurture the collaborative culture
  - Central team controls version of ATS to be used
  - Central team communicates internally on latest features, patterns, and configuration tips

Presented For The Apache Foundation By
LINUX FOUNDATION

Other tips in adopting OSS/ATS

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

- No forking allowed
- No Hacks/No Quick-fixes*

- Communication is very important!

Presented For The Apache Foundation By
LINUX FOUNDATION

Benefits of adopting OS

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

- Properties are empowered to make changes
- Any engineer/team can contribute
- Quality improves because of more reviews from experienced people in the industry
- Voluntary help and collaboration increases
- Hiring & retaining top talent improves

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

Q & A

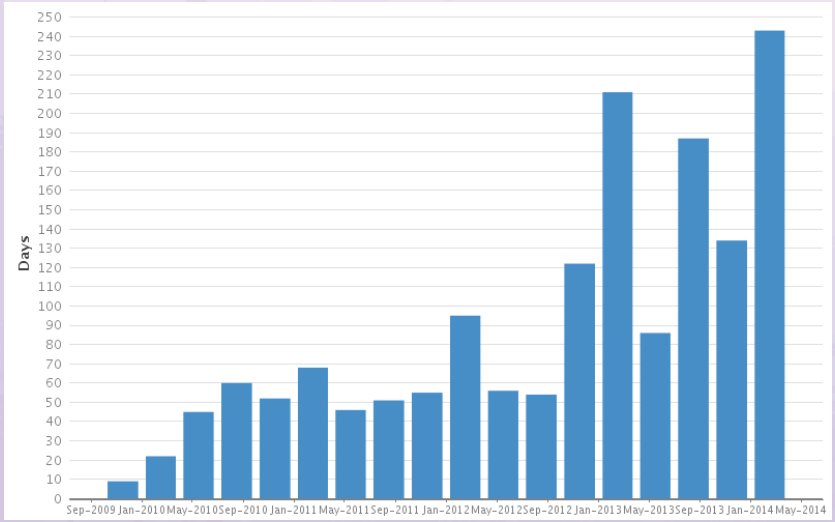
Presented For The Apache Foundation By
LINUX FOUNDATION

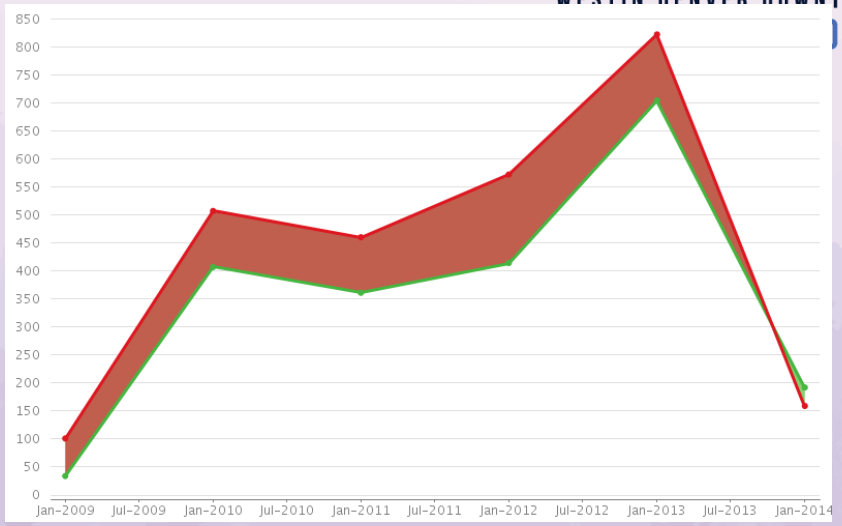
OS Metrics: ATS

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

Presented For The Apache Foundation By
LINUX FOUNDATION

OS Metrics: ATS





Issue resolution time:
increasing since Q4 2012

Issues created vs resolved:
reversed trend in Dec 2013

APACHECON DENVER
WESTIN DENVER DOWNTOWN
Presented For The Apache Foundation By
LINUX FOUNDATION

OS Metrics: ATS

APACHECON
DENVER
WESTIN DENVER DOWNTOWN
APRIL 7-9, 2014

Project	Apache Traffic Server	nginx	Squid Cache	Varnish
Initial Commit	over 4 years ago	over 11 years ago	about 18 years ago	about 8 years ago
Contributors (Past 12 Months)	68 developers	23 developers	46 developers	18 developers
Commits (Past 12 Months)	1,746 commits	604 commits	1,586 commits	1,168 commits

Presented For The Apache Foundation By
LINUX FOUNDATION