Building High Performance Apps with Altinity Stable Builds® for ClickHouse

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Let's make some introductions

Us

Database geeks with centuries of experience in DBMS and applications

You

App developers and business leaders looking to learn about real-time analytics*

ClickHouse support and services including Altinity.Cloud
Authors of Altinity Kubernetes Operator for ClickHouse
and other open source projects

ClickHouse is a SQL Data Warehouse

Understands SQL

Runs on bare metal to cloud

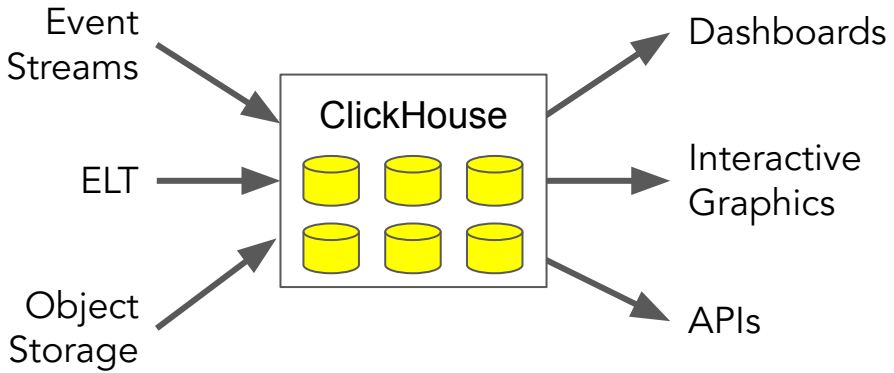
Shared nothing architecture

Stores data in columns

Parallel and vectorized execution

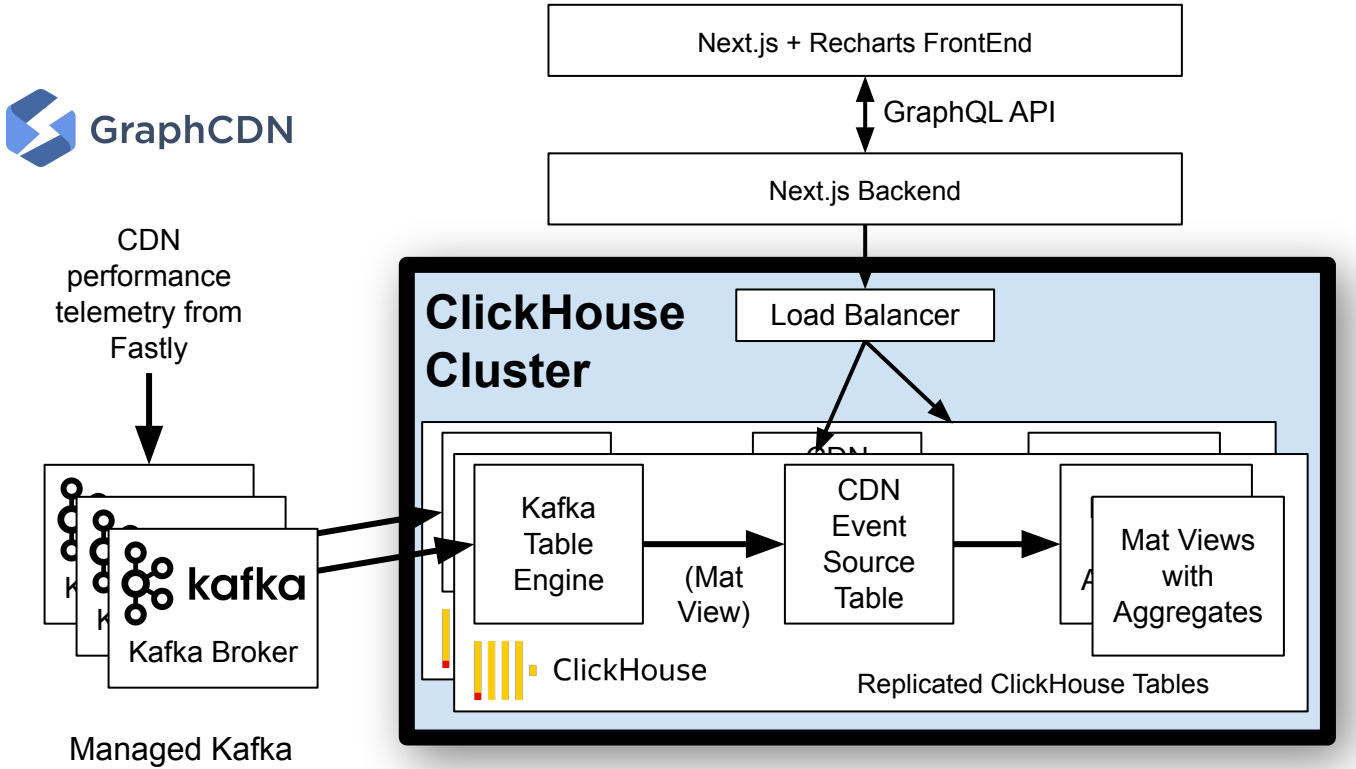
Scales to many petabytes

Is Open source (Apache 2.0)



It's the core engine for real-time analytics

ClickHouse is the center of the analytic stack



Key questions for any app running ClickHouse

Where can I find production ready ClickHouse versions?

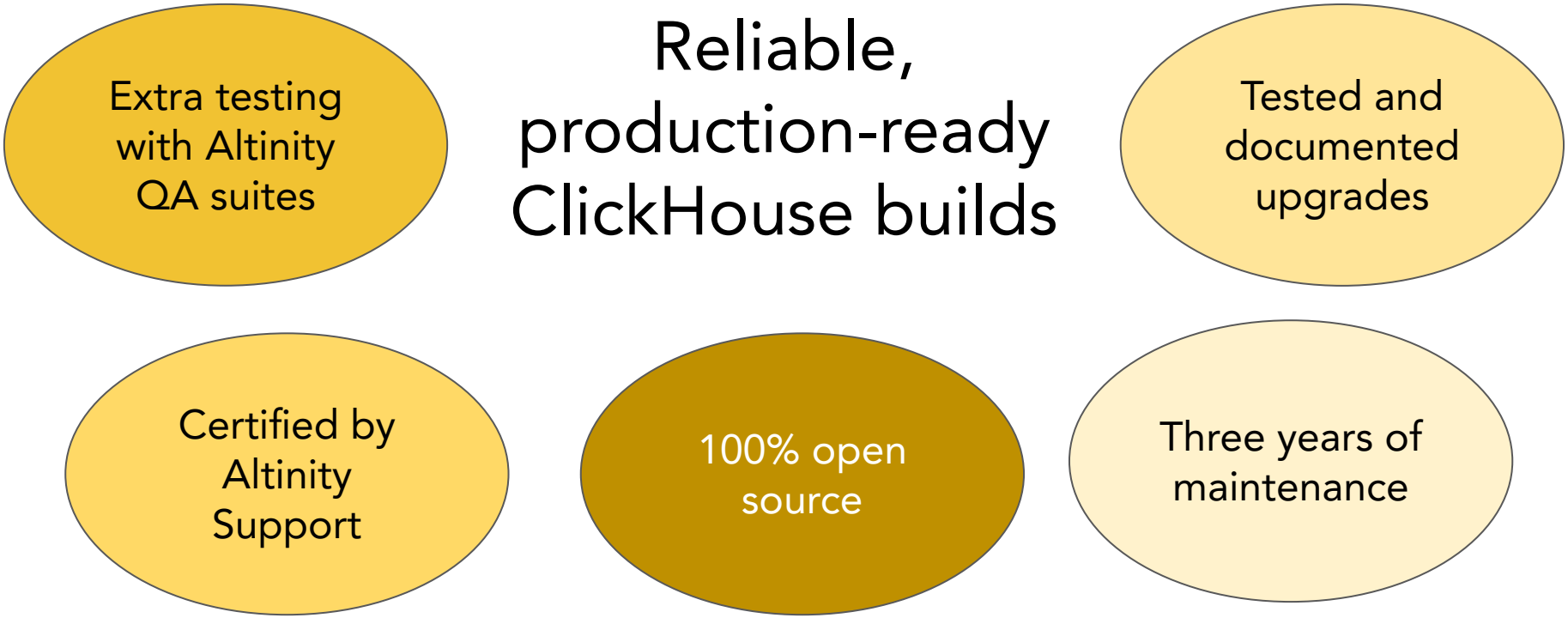
What if there's a bug or a security problem?

How do I know it's safe to upgrade?

How long does support last?

Introducing Altinity Stable Builds® for ClickHouse

What are Altinity Stable Builds?

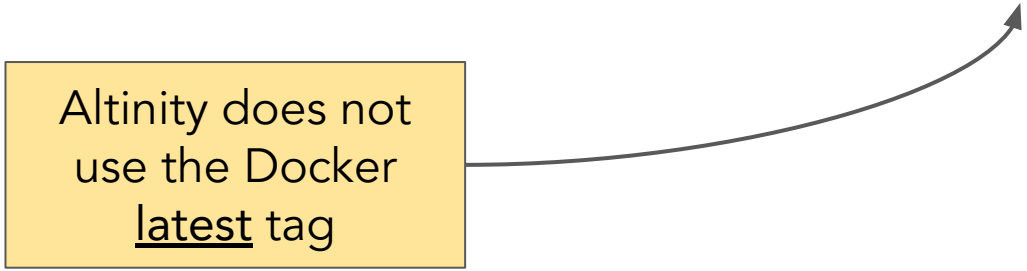


How do you install Altinity Stable Builds? (Ubuntu)

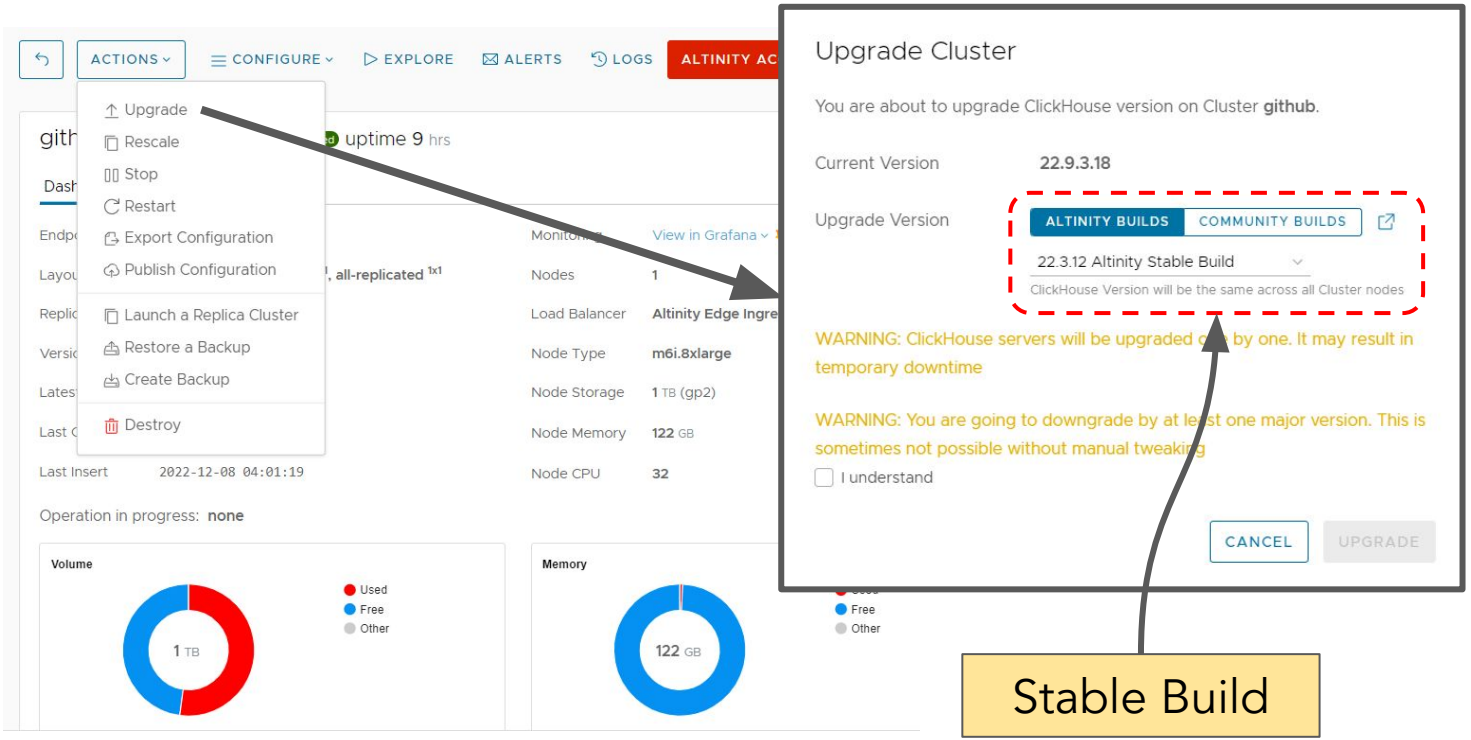
```
sudo mkdir -p /usr/share/keyrings
curl -s https://builds.altinity.cloud/apt-repo/pubkey.gpg |\
 sudo gpg --dearmor >
/usr/share/keyrings/altinity-dev-archive-keyring.gpg

sudo sh -c 'echo "deb
[signed-by=/usr/share/keyrings/altinity-dev-archive-keyring.gpg]
https://builds.altinity.cloud/apt-repo stable main" >
/etc/apt/sources.list.d/altinity-dev.list'


sudo apt-get install -y clickhouse-server clickhouse-client
sudo systemctl start clickhouse-server
```

How do you install Altinity Stable Builds? (Docker)

```
mkdir $HOME/clickhouse-data

docker run -d --name clickhouse-server \
  --ulimit nofile=262144:262144 \
  --volume=$HOME/clickhouse-data:/var/lib/clickhouse \
  -p 8123:8123 -p 9000:9000 \
  altinity/clickhouse-server:22.3.15.34.altinitystable
```



Plus they are automatically available in Altinity.Cloud



Where can you get information about stable builds?

Altinity Stable Builds Life-Cycle Table

The following table lists Altinity Stable builds and their current status. Community builds of ClickHouse are no longer available after Community Support EOL. Contact us for build support beyond the Altinity Extend Support EOL.

Release Notes	Build Status	Latest Version	Release Date	Latest Update	Support Duration	Community Support End-of-Life*	Altinity Extended Support End-of-Life**
22.8	Coming Soon	22.8.x.x	15 Feb 2023	15 Feb 2023	3 years	31 Aug 2023	31 Aug 2025
22.3	Available	22.3.15.34	15 Jul 2022	29 Dec 2022	3 years	31 Mar 2023	31 Mar 2025
21.8	Available	21.8.15.7	11 Oct 2021	15 Apr 2022	3 years	31 Aug 2022	31 Aug 2024
21.3	Available	21.3.20.2	29 Jun 2021	10 Feb 2022	3 years	31 Mar 2022	31 Mar 2024
21.1	Available	21.1.11.3	24 Mar 2021	01 Jun 2022	2 years	30 Apr 2021	31 Jan 2023
20.8	Available Upon Request	20.8.12.2	02 Dec 2020	03 Feb 2021	2 years	31 Aug 2021	02 Dec 2022

https://docs.altinity.com/altinitystablebuilds/

Why not just use ClickHouse community builds?

You can!

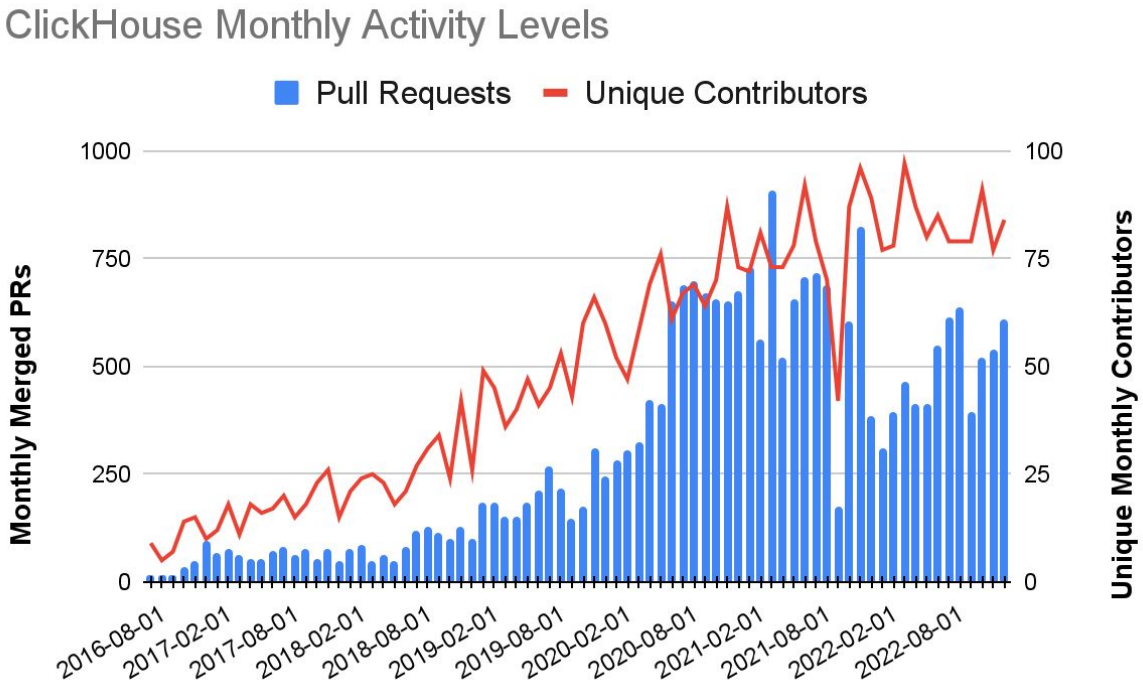
See instructions at https://clickhouse.com/docs/en/install/

But…

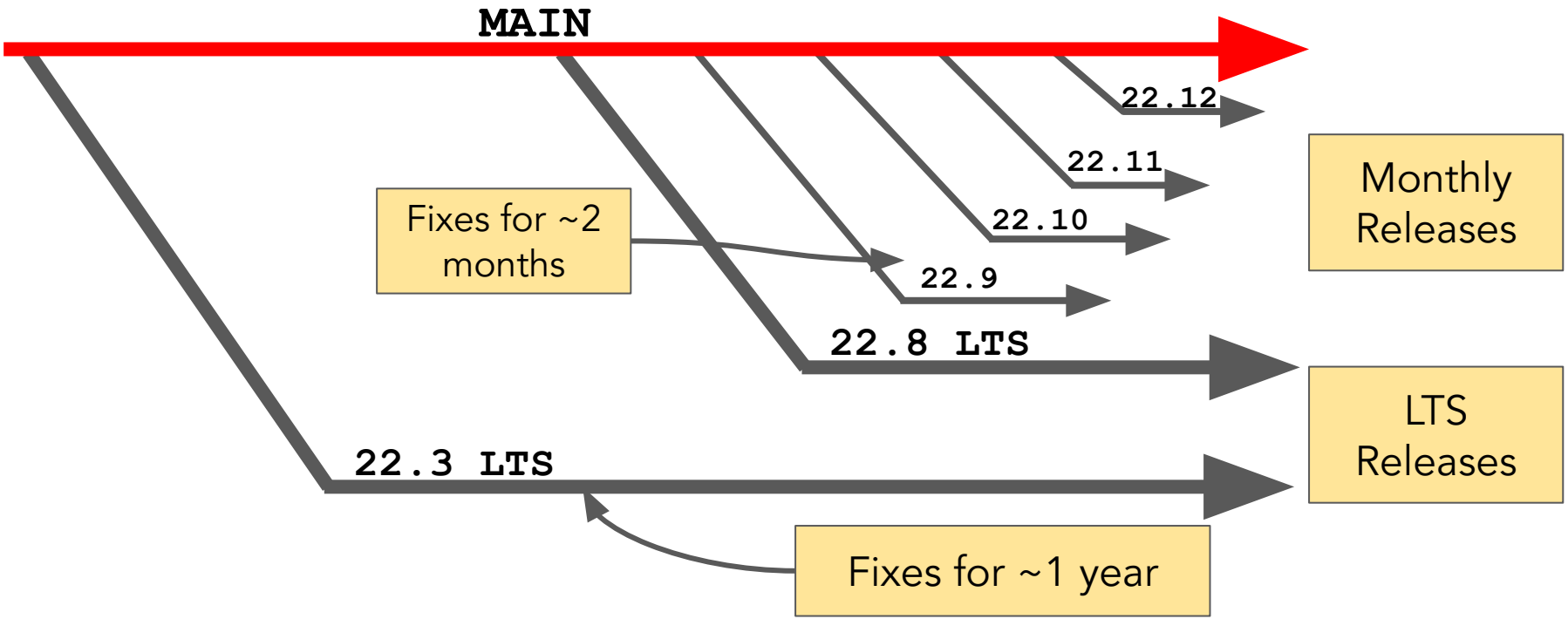
ClickHouse evolves quickly and not all releases are stable

Community support is limited for new releases

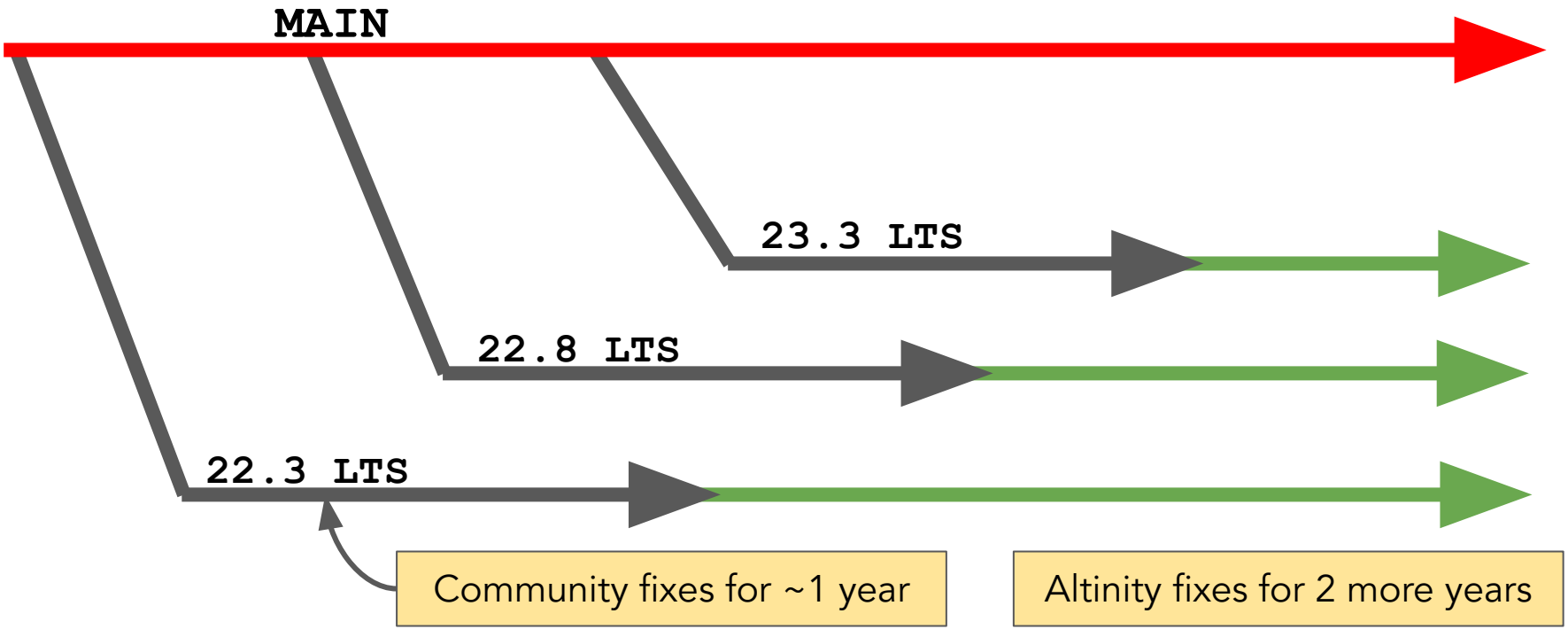
What does it mean to “evolve quickly?”



How do ClickHouse releases work?



Altinity Stable Releases extend LTS support to 3 years

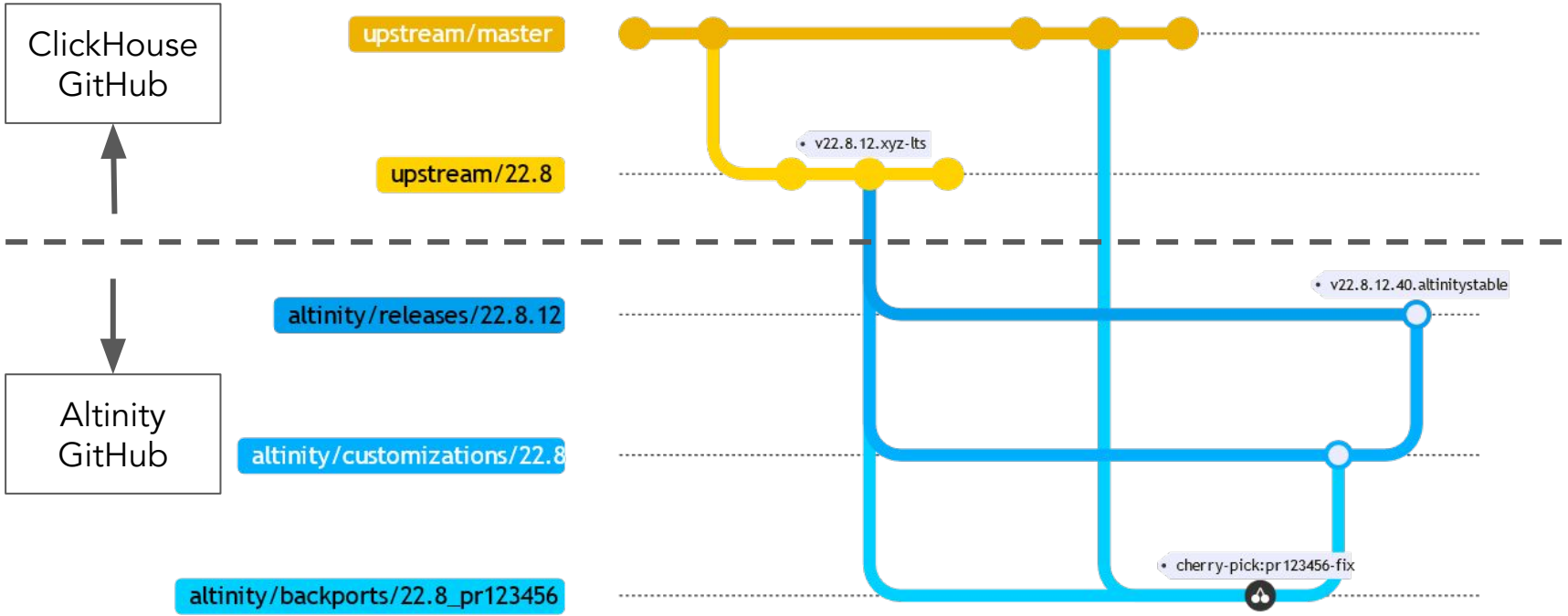


Why does Altinity focus on LTS builds?

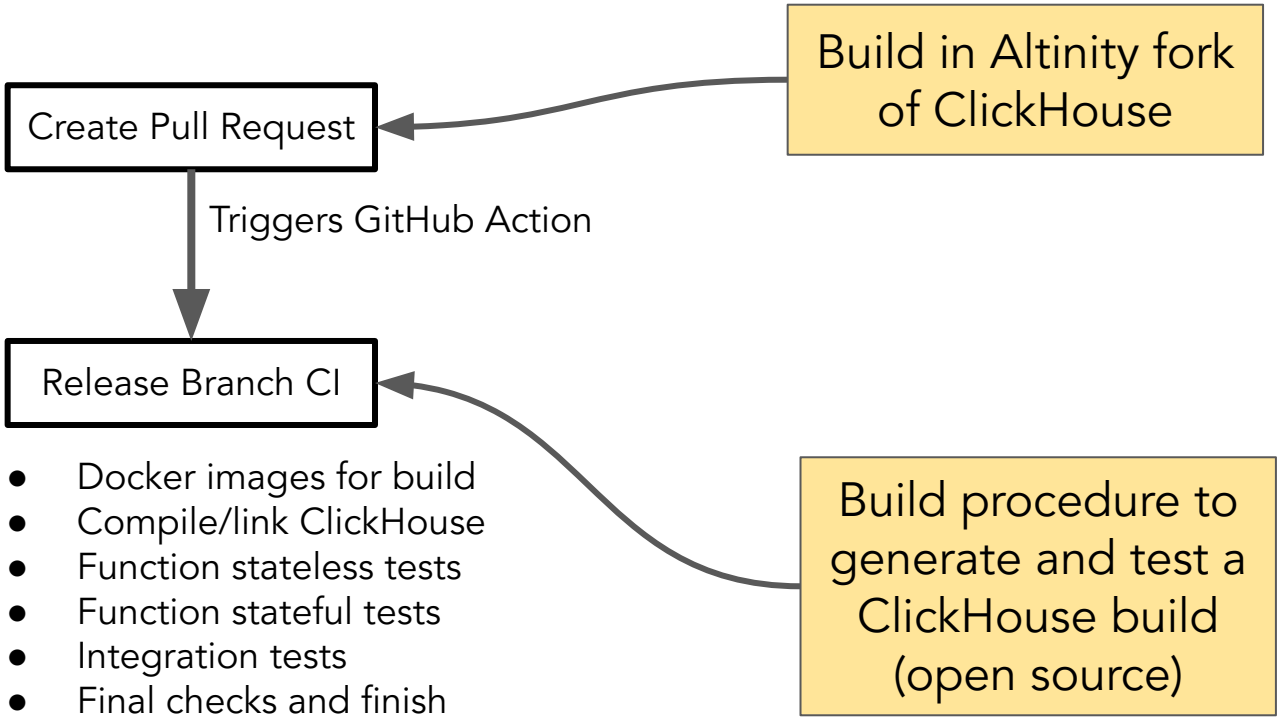
Major ClickHouse installations upgrade *at* most once every 6 months

Aligns Stable Builds with community support policies

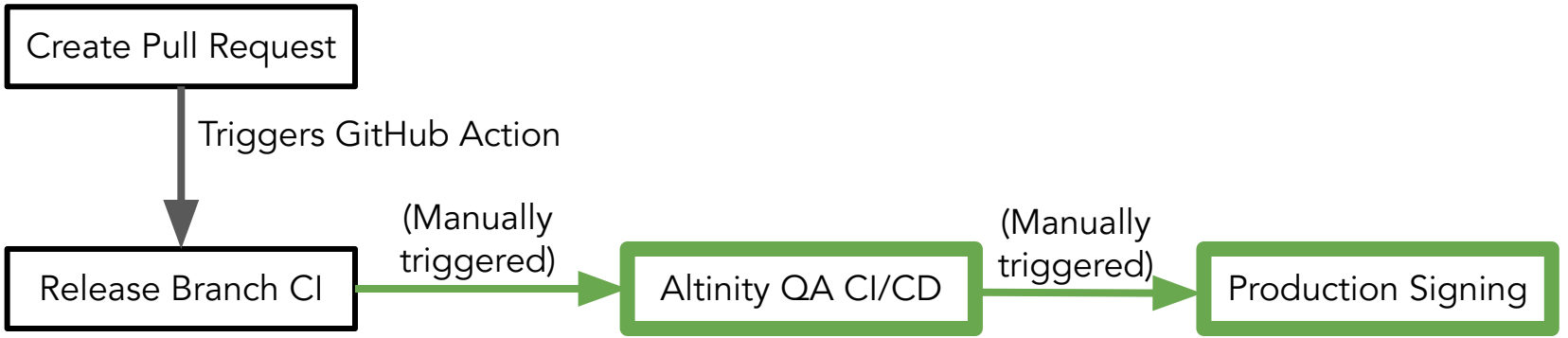
How do we manage changes to make LTS builds work?



How do ClickHouse builds work?



How does Altinity verify and release a Stable Build?



- Docker images for build
- Compile/link ClickHouse
- Function stateless tests
- Function stateful tests
- Integration tests
- Final checks and finish

- Run multiple suites of automated tests
- Perform manual compatibility testing

- Sign artifacts
- Post to repos
- Post to Docker Hub

What kind of extra checks does Altinity QA include?

- Extra suites of automated tests:
  - Window Functions, AES Encryption Functions, ClickHouse Keeper,
  - Extended DateTime64, Disk Level Encryption, Extended Precision Data Types,
  - Kafka, Kerberos, LDAP, Lightweight Delete, Map Data Type,
  - Parquet Data Type, Part Moves Between Shards
  - S3 (MinIO, AWS, GCS), SSL Server,
  - All Tiered Storage (Local Disk, MinIO, AWS, GCS)
- Manual or semi-manual compatibility testing
  - Client drivers: Python, clickhouse-odbc, SQLAlchemy, clickhouse-jdbc,
  - clickhouse-backup
  - Kubernetes: clickhouse-operator
  - Altinity.Cloud
  - Upgrade and Downgrade (between closest Altinity Stable versions, e.g. 22.8 ⇔ 22.3)
  - BI Tools: Grafana, Tableau, Superset

What additional certifications does Altinity Support add?

- Collect feedback from early users of LTS release
- Perform upgrades of live ClickHouse clusters
- Identify backwards incompatible changes
- Track backports of PRs from MAIN to fix critical bugs
- Certify that the release is stable and ready for general use

When do we release Altinity Stable Builds?

Major releases:

- Release when (a) all tests pass, (b) major bugs are fixed, and (c) support certifies release for use

Minor releases:

- In response to customer requests for bug fixes
- In response to severe bugs or security issues regardless of source

Best Practices for Altinity Stable Builds

Using Stable and Community Builds together

ClickHouse Community Builds	Altinity Stable Builds
Recommended for development or when apps depend on cutting edge/bleeding edge ClickHouse features	Recommended for production systems that require stability, tested upgrade, and long-term support

Best practices for system upgrade

Use Altinity Stable builds for production systems (not community builds!)

Check the upgrade notes carefully!

Test the upgrade before running on production systems

1. Restore cluster from backup
2. Upgrade to new version
3. Connect event streams and apps to the new cluster
4. Discard upgraded test cluster after use

Check with Altinity Support! (Let us know about major upgrades in advance.)

What's next?

What's coming in the Altinity Stable 22.8 LTS

- SQL improvements
  - Experimental support for SQL DELETE (aka lightweight deletes)
  - SELECT … INTO OUTFILE and STDOUT
  - Non-constant arguments for LIKE, ILIKE, and match functions
  - Support expressions in window functions
- Security
  - Named collections extended to cover more data sources
- Replication
  - INSERT into system.zookeeper table
- Remote file systems and object storage
  - Proper support for Google Cloud Storage (GCS) in s3() table function
  - Write cache for remote file systems
  - New cache management commands, e.g., DESCRIBE CACHE, etc.

Compatibility issues in 22.8 upgrade

- Ordinary database deprecated
  - System database will be upgraded to Atomic database engine on startup.
  - Can no longer create Ordinary databases (requires setting to re-enable)
- Background pools configuration changed
  - Must be configured in config.xml *and* uses.xml (it's a bug)
- Zero-copy replication for remote file systems
  - It is turned off by default. This is different from 22.3.
- S3 multi-part uploads use more threads
  - Can consume more network bandwidth; may also saturate S3-compatible storage like MinIO

IMPORTANT: There are a number of backwards incompatible changes. See the Altinity release notes!

What's on the roadmap for Altinity Stable Builds?

We'll be working on 23.3 as soon as 22.8 is out

Security features -

- We are working on security enhancements to help customers meet FedRAMP and CIS requirements
- Contact us to find out more - watch for announcements!

Altinity Support Programs for Stable Builds

Community Support

- Altinity Stable Builds are 100% open source
  - Released under Apache 2.0 license, including any Altinity customizations
  - We strive for maximum achievable compatibility with upstream ClickHouse
- You can get help on the AltinityDB slack channel
- Or file issues against https://github.com/Altinity/ClickHouse
  - Please don't log them against the main ClickHouse repo
- Fixes are best effort but…
- We take SEV0 and security problems very seriously

Enterprise Support

- Altinity provides bug fixes to Stable Builds in response to customer cases
  - File a ticket in Zendesk or email support@altinity.com to report problems
- Response to Stable Build issues is covered by the support SLA
- We fix the following types of problems:
  - P0/P1/P2 bugs encountered by customers
  - Security issues however they arise
  - Missing features may also be backported on a case-by-case basis

Altinity also offers NRE (Non-recurring engineering) to add new features to ClickHouse - Contact us for more information

Altinity open source software for ClickHouse

- Altinity Stable Builds – 100% open source builds of ClickHouse
  - Certified for production use
  - 3 years of support
- Altinity contributions to ClickHouse (storage, connectivity, security, data types)
- Altinity Kubernetes Operator for ClickHouse
- Altinity Grafana Plugin (community plugin from Vertamedia)
- Altinity Tableau Connector for ClickHouse
- Altinity Kafka Sink Connector for ClickHouse (MySQL replication)

And many others!!

More information about Altinity Stable Builds

See the documentation at https://docs.altinity.com

YouTube Video: Building ClickHouse and Contributing PRs

Ask on Slack or contact us

Thank you!
Questions?

Website: https://altinity.com
Email: info@altinity.com
Slack: altinitydbworkspace.slack.com

Altinity.Cloud

Altinity Support

Altinity Stable Builds

We're hiring!