PERFORCE

Community vs. Enterprise Open Source

WHICH IS RIGHT FOR YOUR BUSINESS?

Presenter

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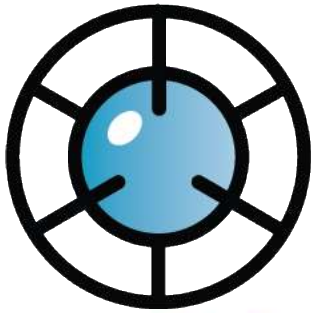

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We offer multiple tiers of enterprise support services for hundreds of open source technologies.

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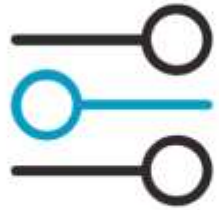
Partner with an open source expert to speed adoption, improve development, and boost security.



Migration Services

Move existing systems to the open source technologies you want in a way that saves time, cuts risk, and improves ROI.

What Are We Discussing?

Community vs. Enterprise/Commercial OSS

- Businesses **differ in their behaviors** and needs in the way that they consume open source software
- Various patterns have **emerged opportunistically** to meet the demands of these various requirements
- One rapidly emerging pattern involves a community open source project, or **"core"** project offered **alongside additional features offered for a cost**
- A vendor such as this can **benefit from open development** while presumably **providing value back to the community**, and added **value back to the user**
- In practice, **certain companies succeed** in establishing this symbiosis, while **others have opportunities** for improvement
- We can see **similarities in the sort of features** and solution add-ons commonly provided by these organizations
- Note that there will **always be inherent benefits to running community upstream versions** such as freedom from license cost obligations and commercial vendor lock-in

TYPICAL ADDONS

- High Availability
- Disaster Recovery
- Enhanced Security
- Platform Interoperability
- Performance Optimization
- Monitoring / Deployment Management

We will **compare the technical features** of several Enterprise Open Source vendors with their community counterparts, and dive into some of that functionality:

Postgres vs. **EnterpriseDB**

Cassandra vs. **Datastax**

Kafka vs. **Confluent**

ELK vs. **Elastic.co**

Puppet vs. **Puppet Enterprise**

Jenkins vs. **Cloudbees**

Postgres vs. EnterpriseDB

Feature Comparison

Feature	EnterpriseDB	Postgres
High Availability	Supported out of the box	Supported via third-party tooling
Disaster Recovery	Supported out of the box	Supported via third-party tooling
Enhanced Security	Additional security functionality out of the box	Additional security through configuration
Platform Interoperability	Oracle supported out of the box	Oracle not supported, but tooling and workarounds are available
Performance Optimization	Supported out of the box	Available via third-party tooling
Monitoring / Deployment Management	Postgres Enterprise Manager included	Many third-party options available

Full comparison available here: https://www.enterprisedb.com/compare-postgres-databases

EnterpriseDB Feature Details

Feature	EnterpriseDB Options
High Availability	This is one of EnterpriseDB's most compelling values, along with its Disaster Recovery features. The EDB Postgres Enterprise Manager provides best-in-class tooling for the management of wide distributions of Postgres databases. Its feature set it too numerous to list here, but is well documented in the footnote URL on the Feature Comparison slide above.
Disaster Recovery	As described in the HA section above, the EDB Postgres Enterprise Manager provides a complete HA and DR solution including replication and disaster recovery. See the documentation provided on the Feature Comparison slide above.
Enhanced Security	The EnterpriseDB platform provides additional security on top of what is already considered to be one of the most secure databases in the world, i.e. Postgres. This includes things like enhanced data auditing, benchmark-specific standards like FIPS, additional SQL injection protection, and Row-Level Access Control.

EnterpriseDB Feature Details

Feature	EnterpriseDB Options
Performance Optimization	The EnterpriseDB platform along with the Enterprise Manager provide a number of optimizations including: **Query Optimizer Hints** – Allows fine-grained control over the way the query engine plans interaction with the database **Session Diagnostics** – Additional metrics available to clients regarding the health and performance of the database session **Analytics** – Canned and calculated metrics giving further visibility into the health of the database engine
Monitoring	See Enterprise Manager as referenced in HA and DR above
Deployment Management	See Enterprise Manager as referenced in HA and DR above

Postgres Community Feature Alternatives

Feature	Postgres Community Options
High Availability	Numerous options are available from the community, but the most common ones are: **Bucardo**: https://bucardo.org/ A popular asynchronous and multi-master solution for replication backed by a very well-respected Postgres community **PGPool-II**: http://pgpool.net/mediawiki/index.php/Main_Page One of the oldest and most mature solutions for HA with Postgres, PGPool takes a database connection pooling approach and creates a pool of highly available connections to Postgres that applications can ”borrow” from Full list here: https://wiki.postgresql.org/wiki/Replication,_Clustering,_and_Connection_Pooling

Postgres Community Feature Alternatives

Feature	Postgres Community Options
Disaster Recovery	Both PGPool and Bucardo can be thought of as DR solutions as well because they provide for replication in addition to availability, but, other strategies specifically for replication exist as well: **WAL Streaming Replication**: https://wiki.postgresql.org/wiki/Streaming_Replication This is a strictly active/passive pattern which is useful for true DR environments where failover is likely to occur manually. As suggested by the name, it streams the write-ahead logs of the database and theoretically allows for the most bulletproof replication possible, at the cost of requiring manual failover. In addition, backup/restore can be scripted or performed manually using command line tools

Postgres Community Feature Alternatives

Feature	Postgres CE Options
Enhanced Security	Out of the box, Postgres provides native authentication / authorization through standard configuration, as well as native TLS. Numerous free community libraries exist which can improve the already robust nature of Postgres's security, such as: **sepgsql**: https://www.postgresql.org/docs/10/sepgsql.html Very interesting project which allows strict control over Postgres resources, yes, table-level resources, using SELinux **pgaudit**: https://www.pgaudit.org/ This project extends Postgres's existing logging to provide much more verbose details about the current Postgres session

Postgres Community Feature Alternatives

Feature	Postgres CE Options
Performance Optimization	As with any database, performance optimization is a tremendous subject. Beyond facilities that are specific to Postgres, optimization of every layer of the stack should be involved when optimizing a database. This includes storage, network, client code, etc. As far as Postgres-specific solutions, the community provides many, including: **pgBadger**: http://pgbadger.darold.net/ A deceptively comprehensive dashboard-driven tool for optimizing Postgres across the board **Standard Config Options**: Postgres core contains same optimization flags as EnterpriseDB including checkpoint_segments and maintenance_work_mem **EXPLAIN/ANALYZE**: Used as normal, fully supported in Postgres Community

Postgres Community Feature Alternatives

Feature	Postgres CE Options
Monitoring	We have numerous mainstream monitoring solutions that will work, which are often preferable to something customized for a single technology: • **Prometheus/Grafana**: https://grafana.com/dashboards/455 • **Nagios**: https://exchange.nagios.org/directory/Plugins/Databases/PostgresQL • **Zabbix**: https://www.zabbix.com/integrations/postgresql • Many others including AppDynamics, SolarWinds, NewRelic, etc
Deployment Management	Postgres has been around for a while and numerous strategies exist for managing deployment, but more modern solutions include: • **Ansible**: https://github.com/geerlingguy/ansible-role-postgresql • **Numerous Ansible Modules**: https://docs.ansible.com/ansible/latest/search.html?q=postgresql*&check_keywords=yes&area=default#

ENTERPRISEDB IS A TURNKEY DATABASE SOLUTION…

- The primary difference really comes down to what is **included out of the box** with EnterpriseDB
- Solutions for HA, DR, Security, Monitoring, etc, are all included as part of the **EnterpriseDB Platform**
- **Many similar solutions exist for Postgres**, but mostly in the form of third-party solutions
- EnterpriseDB offers a lot back to the Postgres community at large, and is an **important part of the Postgres ecosystem**

DBEngine Rankings

Method of calculating the scores of the DB-Engines Ranking

The DB-Engines Ranking is a list of database management systems ranked by their current popularity. We measure the popularity of a system by using the following parameters:

- **Number of mentions of the system on websites**, measured as number of results in search engines queries. At the moment, we use Google, Bing and Yandex for this measurement. In order to count only relevant results, we are searching for <system name> together with the term database, e.g. "Oracle" and "database".
- **General interest in the system.** For this measurement, we use the frequency of searches in Google Trends.
- **Frequency of technical discussions about the system.** We use the number of related questions and the number of interested users on the well-known IT-related Q&A sites Stack Overflow and DBA Stack Exchange.
- **Number of job offers, in which the system is mentioned.** We use the number of offers on the leading job search engines Indeed and Simply Hired.
- **Number of profiles in professional networks, in which the system is mentioned.** We use the internationally most popular professional networks LinkedIn and Upwork.
- **Relevance in social networks.** We count the number of Twitter tweets, in which the system is mentioned.

DBEngine Rankings

Rank Jul 2019	Rank Jun 2019	Rank Jul 2018	DBMS	Database Model	Score Jul 2019	Score Jun 2019	Score Jul 2018
1.	1.	1.	Oracle	Relational, Multi-model	1321.26	+22.04	+43.47
2.	2.	2.	MySQL	Relational, Multi-model	1229.52	+5.89	+33.45
3.	3.	3.	Microsoft SQL Server	Relational, Multi-model	1090.83	+3.07	+37.42
4.	4.	4.	PostgreSQL	Relational, Multi-model	483.28	+6.65	+77.47
5.	5.	5.	MongoDB	Document	409.93	+6.03	+59.60
6.	6.	6.	IBM Db2	Relational, Multi-model	174.14	+1.94	-12.06
7.	7.	↑ 8.	Elasticsearch	Search engine, Multi-model	148.81	-0.01	+12.59
8.	8.	↓ 7.	Redis	Key-value, Multi-model	144.26	-1.86	+4.35
9.	9.	9.	Microsoft Access	Relational	137.31	-3.70	+4.73
10.	10.	10.	Cassandra	Wide column	127.00	+1.82	+5.95

100.	↓ 99.	↓ 98.	CloudKit	Document	2.54	+0.11	+0.75
101.	↓ 96.	↓ 92.	Oracle Coherence	Key-value	2.53	+0.06	+0.41
102.	↓ 101.	↓ 89.	4D	Relational	2.44	+0.05	+0.24
103.	↑ 107.	↓ 102.	IMS	Navigational	2.43	+0.26	+1.02
104.	↓ 103.	↑ 115.	EnterpriseDB	Relational, Multi-model	2.31	+0.03	+1.10
105.	105.	↓ 99.	OpenTSDB	Time Series	2.30	+0.06	+0.56
106.	106.	↓ 95.	TimesTen	Relational	2.30	+0.10	+0.38
107.	↓ 104.	↓ 90.	Apache Jena - TDB	RDF	2.28	+0.00	+0.08
108.	108.	↓ 100.	Datomic	Relational	2.08	+0.07	+0.48
109.	↑ 111.	↑ 128.	Google Cloud Bigtable	Wide column	2.01	+0.13	+1.05

https://db-engines.com/en/ranking
https://db-engines.com/en/ranking_trend/system/PostgreSQL
https://db-engines.com/en/ranking_trend/system/EnterpriseDB

Cassandra vs. Datastax

Feature Comparison

Feature	DataStax Enterprise	Apache Cassandra
High Availability	Supported out of the box	Supported out of the box
Disaster Recovery	Supported out of the box including cloud backup/restore	Supported out of the box
Enhanced Security	Additional security functionality out of the box	Additional security through configuration
Platform Interoperability	Enhanced Spark, Document Store, Graph DBMS	Exclusive language and OS support
Performance Optimization	In-memory processing, faster out of the box	Available via 3rd party tooling
Monitoring / Deployment Management	DataStax OpsCenter Addon	Many 3rd party options available

Full comparison available here: https://db-engines.com/en/system/Cassandra%3BDatastax+Enterprise

DataStax Feature Details

Feature	DataStax Enterprise Options
High Availability	More sophisticated patterns supported out of the box – more granular replication factor configuration including data-center awareness and optimizations for edge computing
Disaster Recovery	Some data consistency improvements over Apache Cassandra in that consistency level is decided per-write as opposed to a blanket setting for the entire dataset. Immediate consistency is available in both products and can be turned on/off per-operation in both products, but, DSE offers additional consistency levels that can be set per-write. * Explanation of DB consistency levels: https://dev.to/barryosull/immediate-vs-eventual-consistency-5cna

DataStax Feature Details

Feature	DataStax Enterprise Options
Enhanced Security	Out of the box, DataStax Enterprise provides solutions for things like: • Encryption At-Rest and Encryption In-Flight ** • Authentication OOB for LDAP / AD / Kerberos • Role-Based and Row-Level Access Control • Data Auditing
Platform Interoperability	The DSE Graph projects provides Graph database concepts running on the DataStax Enterprise engine, and the DSE Search project allows for full-text search and is idea for providing document store capabilities. Numerous connectors built into the development tools including integration with Docker and Kafka

DataStax Feature Details

Feature	DataStax Enterprise Options
Performance Optimization	Claims of 2x-4x performance, on paper the the CPU optimization should perform at this level factoring out poor performance at other areas of the database. Data ownership across a series of cores is better organized, specifically ranges of data are grouped per-thread, and those related sets of data are grouped per-core. Theoretically this should reduce the amount of context switching necessary for the CPU to read and write to the DB.
Monitoring	The DataStax Enterprise OpsCenter product provides monitoring and is provided out of the box, additionally providing several operations features including scheduled backups and other automation and exception tracing. Be aware though that ideally a customer will have a single monitoring solution, or very small number of solutions, for their entire enterprise.
Deployment Management	OpsCenter also provides deployment automation including upgrading, provisioning, and in other ways managing clusters of DataStax Enterprise server nodes.

Apache Cassandra Feature Alternatives

Feature	Apache Cassandra Options
High Availability	Out of the box, Cassandra is built to be a distributed and redundant, multi-datacenter big data engine. Primarily, Cassandra uses two engines to manage high availability: **Snitch**: http://cassandra.apache.org/doc/latest/operating/snitch.html **Gossip**: https://www.linkedin.com/pulse/gossip-protocol-inside-apache-cassandra-soham-saha/
Disaster Recovery	In a big data solution, HA and DR often overlap. These systems are meant to be geographically distributed and highly available, which provides a lot of needed disaster recovery functionality. So, options for data integrity across those replicated nodes becomes the deciding factor. For most circumstances, Cassandra's native Eventual Consistency strategy is adequate and further tuning isn't necessary.

Apache Cassandra Feature Alternatives

Feature	Apache Cassandra Options
Enhanced Security	Encryption-at-rest can be achieved in Apache Cassandra by taking advantage of read and write triggers (encrypt on write, decrypt on read), however it is arguably bad practice to ask the database to encrypt in the first place. Encryption should take place as close to data input and output as possible, which is almost always in the application layer. 3rd party solutions are available for many authentication engines: **LDAP/AD**: https://github.com/instaclustr/cassandra-ldap **Kerberos**: https://github.com/instaclustr/cassandra-kerberos RBAC (Role Based Access Control) is native to Apache Cassandra, while Row Level Access control is only included in DataStax Enterprise Auditing is standard as of Apache Cassandra 4.0

Apache Cassandra Feature Alternatives

Feature	Apache Cassandra Options
Platform Interoperability	Many native open source Cassandra clients exist for most mainstream languages, and integration with popular federation frameworks like Camel and Kafka are available. In general, databases should be accessed through loosely coupled and/or distributed channels and not integrated with directly anyway. Although native Apache Cassandra does not have Graph or Document support, it is arguable that Cassandra should remain Cassandra, and projects like MongoDB be used for Document databases, and projects like Neo4j be used for Graph

Apache Cassandra Feature Alternatives

Feature	Apache Cassandra Options
Performance Optimization	Cassandra is written in Java, and so there are dozens of performance optimization solutions available specific to the JVM. Standard tooling such as JVisualVM, Java Flight Recorder, Jconsole, Java Swiss Army Knife etc, all apply here.
Monitoring	We have numerous mainstream monitoring solutions that will work, which are often preferable to something customized for a single technology: • **Prometheus/Grafana**: https://grafana.com/grafana/dashboards/5408 • **Nagios**: https://exchange.nagios.org/index.php?option=com_mtree&task=search&Itemid=74&searchword=cassandra • **Zabbix**: https://www.zabbix.com/integrations/cassandra • Many others including AppDynamics, SolarWinds, NewRelic, etc Cassandra is written in Java and exposes many JMX metrics as well

Apache Cassandra Feature Alternatives

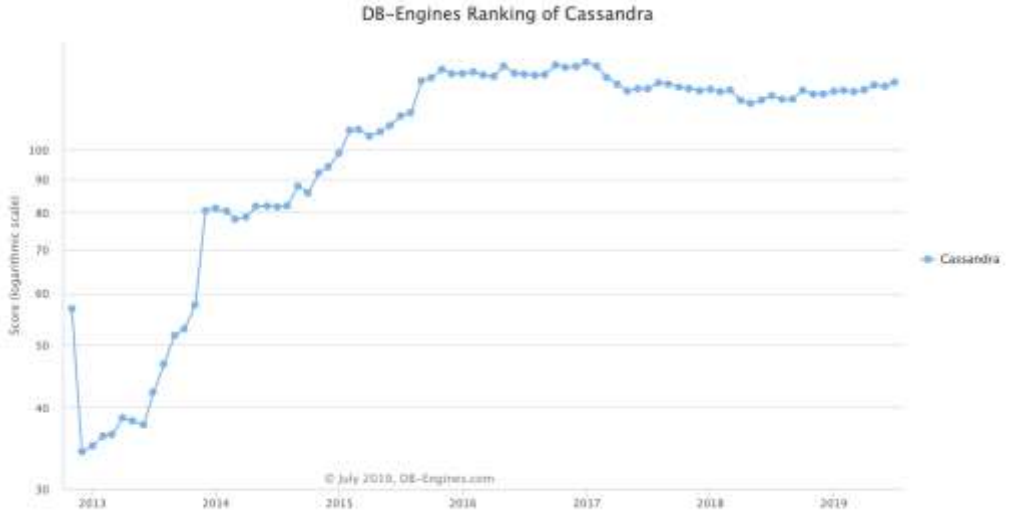
Feature	Apache Cassandra Options
Deployment Management	Numerous tools exist for managing a Cassandra deployment. Cassandra's community edition ships with many of the same internal tools as DataStax, and additional management functionality, similar to what is provided by OpsCenter, can be provided by third-party applications: **Reaper** - http://cassandra-reaper.io/ Provides automated repair and cluster health management for Cassandra **Ansible** - https://github.com/locp/ansible-role-cassandra

SOME REAL VALUE-ADD FOR THE RIGHT CUSTOMER…

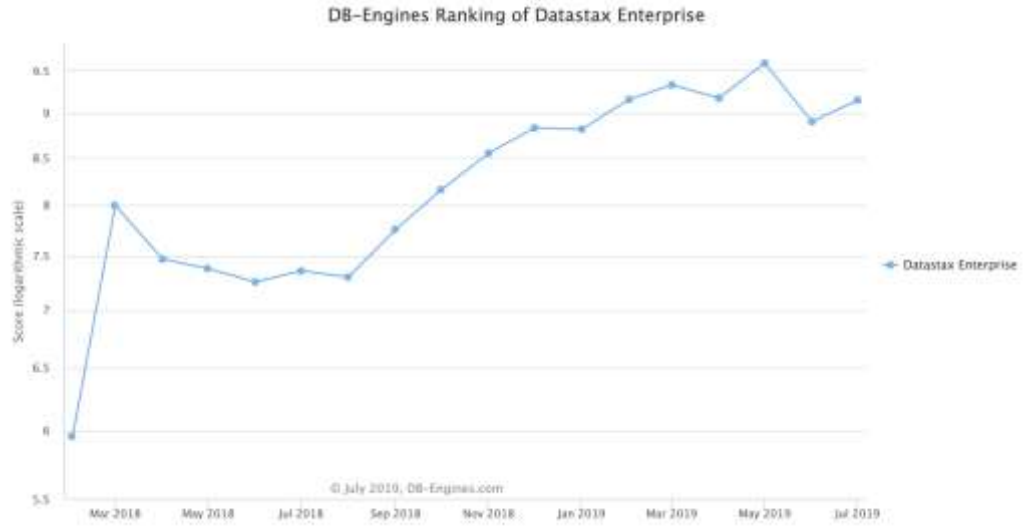
- DataStax Enterprise does provide real value for those who would like **a solution that works off of the shelf**
- That said, with only a few exceptions, almost all of the functionality can be replicated in other free and community open source projects
- Those who need extreme fine tuning will benefit from DSE's consistency options
- And OpsCenter provides a remarkable amount of functionality
- DataStax as a company provides a lot of work and support back to the community, and is a good example of a company who does enterprise open source The Right Way ™

DBEngine Rankings

6.	6.	6.	IBM Db2	Relational, Multi-model	174.14	+1.94	-12.06
7.	7.	↑ 8.	Elasticsearch	Search engine, Multi-model	148.81	-0.01	+12.59
8.	8.	↓ 7.	Redis	Key-value, Multi-model	144.26	-1.86	+4.35
9.	9.	9.	Microsoft Access	Relational	137.31	-3.70	+4.73
10.	10.	10.	Cassandra	Wide column	127.00	+1.82	+5.95
11.	11.	11.	SQLite	Relational	124.63	-0.26	+9.35
12.	↑ 13.	↑ 13.	Splunk	Search engine	85.49	+0.87	+16.25
13.	↓ 12.	↑ 14.	MariaDB	Relational, Multi-model	84.44	-0.76	+16.92
14.	14.	↑ 18.	Hive	Relational	80.87	+1.82	+23.25



39.	39.	↓ 38.	Greenplum	Relational, Multi-model	12.48	+0.30	+1.68
40.	40.	40.	Oracle Essbase	Relational	11.70	+0.32	+2.57
41.	41.	↑ 42.	Firebase Realtime Database	Document	11.28	+0.44	+3.75
42.	42.	↑ 44.	Microsoft Azure SQL Data Warehouse	Relational	9.31	-0.28	+2.22
43.	43.	43.	Datastax Enterprise	Wide column, Multi-model	9.15	+0.25	+1.79
44.	44.	↓ 41.	Hazelcast	Key-value, Multi-model	8.27	+0.41	-0.50
45.	45.	↑ 49.	Realm	Relational	7.43	-0.24	+1.86
46.	↑ 49.	↓ 45.	Sphinx	Search engine	6.69	+0.37	-0.10
47.	↑ 48.	47.	Interbase	Relational	6.64	+0.22	+0.31



https://db-engines.com/en/ranking
https://db-engines.com/en/ranking_trend/system/Cassandra
https://db-engines.com/en/ranking_trend/system/Datastax+Enterprise

Kafka vs. Confluent

Feature Comparison

Feature	Confluent	Apache Kafka
High Availability	Provided out of the box	Provided out of the box
Disaster Recovery	Provided out of the box	Provided out of the box and improved with 3rd party tooling
Enhanced Security	Basic security out of the box	Basic security out of the box
Platform Interoperability	Provided out of the box	Many 3rd party clients and connectors
Performance Optimization	Comparable Performance	Comparable Performance
Monitoring / Deployment Management	Provided out of the box	Many 3rd party solutions available

Full comparison available here: https://community.hortonworks.com/storage/attachments/72591-kafka.jpg

Confluent Feature Details

Feature	Confluent Options
High Availability	The Confluent Control Center provides a GUI that can help manage the health of a Kafka cluster, but, Kafka is designed from the ground up to be highly available in the first place
Disaster Recovery	Confluent Replicator provides a streaming replication function to ensure that data is consistent across nodes in the cluster. Just as in the HA solution, though, Kafka has built in replication strategies and is designed for distributed data integrity at scale.
Enhanced Security	Access Control Lists in Confluent can be mapped to Active Directory / LDAP groups
Platform Interoperability	Many client libraries are provided in the developer tools, as well as a hub for additional connectors called Confluent Hub. Both a REST and MQTT proxy are provided for alternate protocol connectivity and event schemas can be centralized and organized to ensure compatibility with future clients

Confluent Feature Details

Feature	Confluent Options
Performance Optimization	Kafka is built with performance in mind and so performance is similar between Confluent and Apache Kafka. Confluent does ship with an optimization feature called "Auto Data Balancer" that automatically ensures that topic partitions are balanced across a Kafka cluster, ensuring managed efficiency in resource utilization.
Monitoring	Confluent Control Center provides monitoring specific to Kafka. Be aware though that ideally a customer will have a single monitoring solution, or very small number of solutions, for their entire enterprise.
Deployment Management	Confluent Operator (future release) will automate the deployment of Kafka in a Kubernetes environment – this is of course already possible (and commonly implemented) using tools like Helm and/or Ansible with Apache Kafka

Apache Kafka Feature Alternatives

Feature	Apache Kafka Options
High Availability	Apache Kafka is built to be a highly available distributed solution, and so HA is native to its operation. It uses Apache Zookeeper to implement quorum election routines which ensure that nodes are available to clients across multiple racks and data centers.
Disaster Recovery	Aside from Kafka's built in replication, which can be problematic when very large / old sets of event data are being retained and replicated (across both Confluent and Apache Kafka) additional third-party tools exist which can assist with DR: **MirrorMaker** - https://cwiki.apache.org/confluence/pages/viewpage.action?pageId=27846330 Community-provided manual replication solution, not as robust as Confluent Replicator **uReplicator** - https://github.com/uber/uReplicator Free OSS replication solution provided by Uber, on par with Replicator

Apache Kafka Feature Alternatives

Feature	Apache Kafka Options
Enhanced Security	Kafka ships with functionality for RBAC, Auditing, and Encryption out of the box. LDAP / AD integration is provided with native Java Security, by implementing the javax.security.auth.spi.LoginModule interface, which is a very common pattern for attaching Apache Java technology to external security.
Platform Interoperability	Kafka **integrates seamlessly with Apache Camel**, which can in turn integrate with hundreds of other platforms including MQTT and REST. In addition, community-provided client libraries exist for dozens and dozens of programming languages including Java, C++, Ruby, Python, .NET etc.
Performance Optimization	Kafka is built with performance in mind and so performance is similar between Confluent and Apache Kafka. Kafka is written in Java, and so there are dozens of performance optimization solutions available specific to the JVM. Standard tooling such as JVisualVM, Java Flight Recorder, Jconsole, Java Swiss Army Knife etc, all apply here.

Apache Kafka Feature Alternatives

Feature	Apache Kafka Options
Monitoring	We have numerous mainstream monitoring solutions that will work, which are often preferable to something customized for a single technology: • **Prometheus/Grafana**: https://grafana.com/grafana/dashboards/721 • **Nagios**: https://www.nagios.com/solutions/jmx-monitoring/ • **Zabbix**: https://www.zabbix.com/integrations/kafka • Many others including AppDynamics, SolarWinds, NewRelic, etc Kafka is written in Java and exposes many JMX metrics as well
Deployment Management	Kafka is very well supported within both Ansible and Kubernetes, as well as other platforms like Chef, Puppet, Salt, etc. The same is true for Zookeeper, which is essential to running Apache Kafka in a highly managed way.

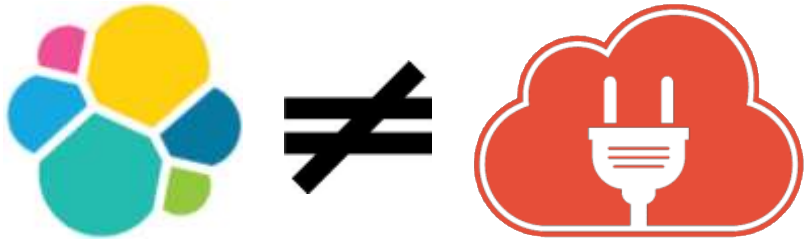
CONFLUENT IS MOSTLY ABOUT COMMERCIAL SUPPORT…

- Confluent itself **doesn't provide many extra features** that cannot be realized using community components
- **Kafka is already enterprise-ready**, and has one of the most robust community-driven ecosystems available
- Organizations **seeking enterprise support** may look at Confluence as an organization with the relevant experience
- If a **zero-touch streaming platform** is desired, Confluent may provide such an experience

ELK vs. Elastic.io

It's Elastic.co, not Elastic.io

- First, a common point of confusion arises from the fact that **there a lot of "Elastic" companies** out there!
- The most common point of confusion is **Elastic.io** vs. **Elastic.co**
- The product that we are talking about here has an **enterprise edition in Elastic.co**
- Elastic.io is an **unrelated API integration platform**



And Community Edition is separated…

THREE DIFFERENT PRODUCTS…

- The community edition of the ELK stack is comprised of three separate products:
  - **ElasticSearch** – To store and allow for searching through log data
  - **Logstash** – To process and ingest log data
  - **Kibana** – To visualize log data and create dashboards
- The commercial Elastic.co product combines all three CE products into a single stack

Feature Comparison

Feature	Elastic.co Commercial	ELK Community
High Availability	Included out of the box	Included out of the box
Disaster Recovery	Included out of the box	Included out of the box
Enhanced Security	Included out of the box	Not included
Platform Interoperability	N/A – Logs are cross-platform	N/A - Logs are cross-platform
Performance Optimization	Additional scaling out of the box	Not included
Monitoring / Deployment Management	Included out of the box	Available via third party solutions

Full comparison available here: https://www.elastic.co/subscriptions (Expand All Features)

Elastic.co Commercial Feature Details

Feature	Elastic.co Options
High Availability	Value add to master election process with the addition of a voting-only master node process, which allows a master to exist live in a disaster recovery environment and participate in master election, but never be elected master itself – which is ideal for DR
Disaster Recovery	Cross-cluster replication provided by X-Pack, improved data management features such as incremental snapshots and digesting. Frozen indices allow for more reliable long-term storage of logging data. And DR improvement to HA add-on above.
Enhanced Security	Quite a bit of additional security, encryption, RBAC, IP Black/Whitelisting, data auditing, LDAP/AD/SSO integration, field/document-level control, and FIPS support. This is managed through the X-Pack “Shield” plugin. Arguably the most compelling feature.
Platform Interoperability	SQL APIs allow for interaction with ElasticSearch using JDBC/ODBC clients. Larger quantity of data sources available, native support for sixteen additional sources including Azure and CockroachDB

Elastic.co Commercial Feature Details

Feature	Elastic.co Options
Performance Optimization	ElasticSearch query profiler allows for more detail during queries. Machine learning capabilities provide faster identification of application problems that are being monitored by Elastic.co.
Monitoring	Additional monitoring functionality provided by X-Pack. Full and multiple stack monitoring, alerting. Slack, Pagerduty, etc available at higher tiers. Be aware though that ideally a customer will have a single monitoring solution, or very small number of solutions, for their entire enterprise.
Deployment Management	Upgrade assistant, centralized management for Logstash and Beats at higher tiers

ELK Community Feature Alternatives

Feature	ELK Community Options
High Availability	Each component of the ELK stack has its own individual options for HA, since each of these started as their own independent project. ElasticSearch has excellent HA options out of the box, and both Logstash and Kibana are highly portable and can be placed in a container and kept available via mechanisms like Kubernetes. Or, for a non container environment, any type of environmental redundancy will apply.
Disaster Recovery	Just as in the HA section above, each individual technology has options for achieving DR through third party solutions like Kubernetes.
Enhanced Security	While X-Pack does provide very comprehensive security for ELK, basic architectural security practices will obviate the need for most of these features, for most businesses. Why would an internal system monitor, for instance, ever be allowed to be publicly accessible over the open internet? That takes care of almost all attack vectors, unless a companies internal network has been compromised. Security of monitoring systems deserves a large discussion but is outside the scope of this presentation.

ELK Community Feature Alternatives

Feature	ELK Community Options
Platform Interoperability	On the ingress, log data is ubiquitous text and so ELK can consume it from just about any system. In terms of exposing the data, similarly to Kafka, ElasticSearch integrates with Camel and so can be queried or integrated with hundreds of other community platforms using Camel.
Performance Optimization	Almost all of the platform's performance lies in the performance of ElasticSeach, and as mentioned the commercial edition provides query optimization. These optimizations are possible via just legwork against the community edition of ElasticSearch, though the work can be a bit rigorous. Ultimately the same performance can be achieved with more work up front.
Monitoring	Standard community options apply here, Zabbix, Grafana, Prometheus, Nagios, all have options
Deployment Management	Like any other deployment, third party tooling can assist with deployment of all three technologies. It is a fragmented stack and so individual solutions will be needed for each piece, but ultimately deployment can be controlled just as well as in the Elastic.co edition via things like Ansible.

TAKE THE GOOD WITH THE BAD…

- On the one hand, the solutions that Elastic.co provides are in fact **very valuable and worth the cost of entry**
- The **problem lies in the way they manage the "open source"** nature of their X-Pack offering
- The offering is constructed to benefit Elastic.co but **not necessarily benefit the community**
- So, **Elastic.co** does in fact have a **good and compelling product**
- But their success is **not carrying over to the broader community**, which is troubling

Puppet vs. Puppet Enterprise

Textbook ‘Enterprise’ Solution

- [HEADER] Master of Puppets …
- Here we see probably the most textbook example of an enterprise using *other* community open source to build an enterprise solution
- As we will discover, Puppet Orchestrator or the now-deprecated MCollective mechanisms are the main selling point of Puppet Enterprise
- This is basically just community ActiveMQ, tuned and/or configured for heavy scale and high availability
- So, as we sometimes see, Puppet Enterprise offers solutions that can also be realized with community open source

Feature Comparison

Feature	Puppet Enterprise	Puppet Community
High Availability	Available out of the box	Available via 3rd Party Tooling
Disaster Recovery	Available via Puppet Cloud solutions	Available via 3rd Party Tooling
Enhanced Security	Available via 3rd Party Tooling	Available via 3rd Party Tooling
Platform Interoperability	Available out of the box, Puppet automates everything	Available out of the box, Puppet automates everything
Performance Optimization	No discernable difference	No discernable difference
Monitoring / Deployment Management	Puppet Orchestrator can help with deployment	Puppet Orchestrator is just ActiveMQ

https://www.upguard.com/articles/open-source-puppet-vs.-puppet-enterprise-which-is-right-for-you

Puppet Enterprise Feature Details

Feature	Puppet Enterprise Options
High Availability	Available via Puppet Orchestrator, which creates an active-active HA model with a Puppet master server. Note that multiple Puppet masters are already supported in the community edition, Puppet Orchestrator will just assist with deploying them.
Disaster Recovery	Puppet Enterprise is betting on the cloud, so DR solutions are available via cloud mechanics. Puppet Orchestrator also provides replication solutions.
Enhanced Security	Puppet Enterprise provides easier LDAP and AD integration
Platform Interoperability	Puppet Enterprise doesn't really interact with and automate anything additional that Puppet Community can't automate, not much extra provided here

Puppet Enterprise Feature Details

Feature	Puppet Enterprise Options
Performance Optimization	Puppet's performance is really much more dependent on the systems it is controlling, so, performance is going to be comparable to the community edition. Horizontal scaling is very much the point of MCollective/Puppet Orchestrator which will help with achieving performance but isn't really specific to Puppet in terms of the scaling pattern.
Monitoring	Puppet Enterprise features a dashboard that will let you look at individual Puppet processes, but, other monitoring solutions as usual are going to be superior.
Deployment Management	Puppet Enterprise includes two tools for automatically managing and deploying Puppet nodes, Code Manager and r10k. Code Manager is in the process of subsuming r10k to become the de facto platform. Both of these tools will allow you to deploy full Puppet environments, but Code Manager is shaping up to be more feature-rich and will likely supplant r10k.

Puppet Community Feature Alternatives

Feature	Puppet Community Options
High Availability	Puppet Orchestrator is basically just Apache ActiveMQ with messaging constructs set up for wide control of Puppet masters. Interestingly, ActiveMQ is a platform for Message-Oriented-Middleware, or MOM, and Puppet describes this messaging platform as a ”Master of Masters” or “MoM” solution. This Master of Masters pattern can very easily be implemented using community ActiveMQ.
Disaster Recovery	Puppet is just an app and so standard DR / cloud functionality will work with it as per normal, and as mentioned in the HA section above, a lot of replication work happens at the messaging layer and can be reimplemented relatively easily.
Enhanced Security	Architecturally speaking, Puppet Masters regardless of Enterprise or Commercial build status should be guarded heavily. Massive infrastructure damage can be achieved by bad actors who gain control of a Puppet Master server. So, no amount of additional security provided by an enterprise entity can make up for ensuring that Puppet Masters are locked down harder than almost anything else in your environment.

Puppet Community Feature Alternatives

Feature	Puppet Community Options
Performance Optimization	As mentioned in the Puppet Enterprise discussion, Puppet's performance really depends more on the downstream systems. The community edition of Puppet will perform similarly to the enterprise edition.
Monitoring	As with all of our other technologies, most people have third party monitoring solutions already implemented and they will work perfectly with Puppet.
Deployment Management	Puppet itself is about managing deployment, so, it should come as no surprise that the platform itself is very easy to deploy and manage out of the box. Orchestrator/MCollective will ease scaling initiatives but as discussed that can be achieved using community ActiveMQ. Note, however, the irony of the Puppet- Ansible project which orchestrates Puppet masters using Ansible: https://github.com/terrimonster/puppet-ansible …Yeah, that's like selling Dunkin' Donuts coffee at a Starbucks. ;-p

ANOTHER TIME WHERE SUPPORT IS THE MAIN DRIVER…

- The Puppet Enterprise **features don't add much** that can't be implemented using basic messaging patterns with ActiveMQ
- That said, Puppet Manifests can be difficult to write, and **often organizations needs training and/or support** to maintain their Puppet infrastructure
- Puppet Enterprise **provides a wealth of content and services** to help with implementation and maintenance

We've Been Here Before… Heard of Hudson?

- It is obvious that CI/CD patterns and **SDLC maturity is a big focus** for businesses right now
- **Jenkins is the clear winner** in the open space, having commanded the most adoption for automating CI/CD pipelines in an organization
- So what does Cloudbees, the **enterprise arm of Jenkins**, offer above and beyond the product?
- And what we can learn from **the failed Hudson project**, which Jenkins forked from, and which tried and failed to be a commercial CI/CD company?
- All this and more in our final technology installment!

Cloudbees Does Remarkable Stuff!

- Well beyond the Jenkins platform, Cloudbees has made a business out of **helping people deploy code** – they now have a slew of solutions which have nothing to do with Jenkins: https://www.cloudbees.com/products
- None of their solutions are things that couldn't be implemented by a customer **given a bit of legwork**
- But they **do have the right philosophy** when it comes to managing code
- And some **very smart people** work there and are helping businesses change the way they deploy their infrastructure

Cloudbees vs. Jenkins

Feature	Cloudbees	Jenkins Community
High Availability	Provided out of the box	Available via 3rd Party Tooling
Disaster Recovery	Provided out of the box	Available via 3rd Party Tooling
Enhanced Security	Provided out of the box	Provided out of the box
Platform Interoperability	Provided out of the box	Provided out of the box
Performance Optimization	Provided out of the box	Provided out of the box
Monitoring / Deployment Management	Provided out of the box	Available via 3rd party tooling

Full (subjective) comparison available here: https://www.slant.co/versus/628/2477/~cloudbees_vs_jenkins

Cloudbees Feature Details

Feature	Cloudbees Options
High Availability	As imagined, Cloudbees's business model is based on running Jenkins in the cloud. So, your normal HA options apply here when dealing with cloud constructs. Think of it as a managed Jenkins service that you generally don't have to worry about.
Disaster Recovery	DR is the same story as HA here, it's a managed service that you generally don't need to worry about.
Enhanced Security	Cloudbees secures their hosting of Jenkins, and the Jenkins core product has a dedicated security team and their work cascades downstream to Cloudbees. Protection of IP and source, as well as control over automated build processes, is one of the most critical vectors for a business to protect, so it is unsurprising that Jenkins comes out very strong in this area.
Platform Interoperability	Dozens and dozens of platforms and languages have been integrated with in the form of Jenkins Plugins which are available for both Cloudbees and the community edition of Jenkins.

Cloudbees Feature Details

Feature	Cloudbees Options
Performance Optimization	Cloudbees doesn't do much to optimize the performance of their fork of Jenkins, beyond tuning it appropriately for their cloud hosting. Normal infrastructure scaling rules apply here.
Monitoring	Jenkins has a companion monitoring plugin which is fully compatible with the Cloudbees version. It is meant to expose data for 3rd party monitoring, which is the most common pattern for enterprises these days anyway.
Deployment Management	Here Cloudbees obviously shines as they are able to deploy and manage Jenkins in the cloud for you. Of course 3rd party tooling exists to bring the same functionality to community Jenkins.

Jenkins Community Feature Alternatives

Feature	Jenkins Community Options
High Availability	At this point, Jenkins has become so ubiquitous that it has literally been deployed on every platform imaginable, in every direction imaginable. Countless HA solutions exist, both native to the Jenkins project. The rapidly emerging Jenkins X project is a native open source implementation built for community Kubernetes, and offers extreme availability for the platform. This is just one of many such examples.
Disaster Recovery	And as is the case with HA, so it is with DR. Again, many many solutions have been presented for this, including but not limited to native clustering, Docker clusters, Kubernetes clusters in Jenkins X, and beyond.
Enhanced Security	Jenkins ships with deep security features out of the box, natively. The only thing Cloudbees provides beyond that is deploying in their cloud and according to their (presumably) good security standards.
Platform Interoperability	Jenkins has dozens and dozens of language and platform plugins which are freely available and allow it to work with pretty much any modern development framework.

Jenkins Feature Alternatives

Feature	Jenkins Options
Performance Optimization	This really has more to do with how your CI/CD pipeline is designed, the kinds of jobs you are running, and the environment in which Jenkins is deployed. As is normally the case performance optimization can be achieved through due diligence. Cloudbees pre-optimizes for their cloud platform, but only for their platform.
Monitoring	Standard community options apply here, Zabbix, Grafana, Prometheus, Nagios, all have options
Deployment Management	Many open source solutions have emerged for managing and deploying Jenkins servers, and the Jenkins X project is geared towards achieving those kinds of things in a Kubernetes environment. Standard things like Ansible apply here, as well as bespoke solutions like the Jenkins Docker plugin.

CLOUDBEES SEEMS TO BE DOING BETTER THAN HUDSON…

- Hudson failed because it was **swimming upstream** against a rising current of open source development
- The need for strong CI/CD was just as present when the Jenkins project was first released, and having a truly free platform and ecosystem won that war
- This **was pre-cloud-revolution**, though, so Cloudbees's approach to treating Jenkins as a managed service is going well
- In the meantime Jenkins is still seeing the most adoption as demonstrated here…

Market Rankings…

CloudBees	Jenkins
Ranking	
3rd	1st
out of 26 in Build Automation	out of 26 in Build Automation
Views 6,881	Views 41,691
Comparisons 2,809	Comparisons 11,999
Reviews 10	Reviews 14
Average Words per Review 745	Average Words per Review 280
Avg. Rating 7.7	Avg. Rating 8.2

https://www.itcentralstation.com/products/comparisons/cloudbees_vs_jenkins

Closing Thoughts…

Thoughtfulness Pays Off

- As more and more vendors emerge with open core solutions, **we should be mindful of the balance** between freedom and convenience
- Many **vendors provide valuable solutions** and addons which will legitimately improve your experience consuming open source
- And other vendors have **invested heavily in support resources** and can provide augmentation to your existing support infrastructure
- In the end, **do the research** and ensure you'll really use the additional functionality
- **Scrutinize the vendor** and make sure that they are giving back to the communities that they benefit from branding
- **Consult with experts** and get their opinions!

Reach Out – I Like People!

LinkedIn – Only Justin Reock in the world!

Blog - https://www.openlogic.com/blog

Email – jreock@perforce.com

Questions?