

New LDBC SNB Benchmark Record by Galaxybase  
More than **6 times faster** and **70% higher throughput**

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# CreateLink Technology Introduction

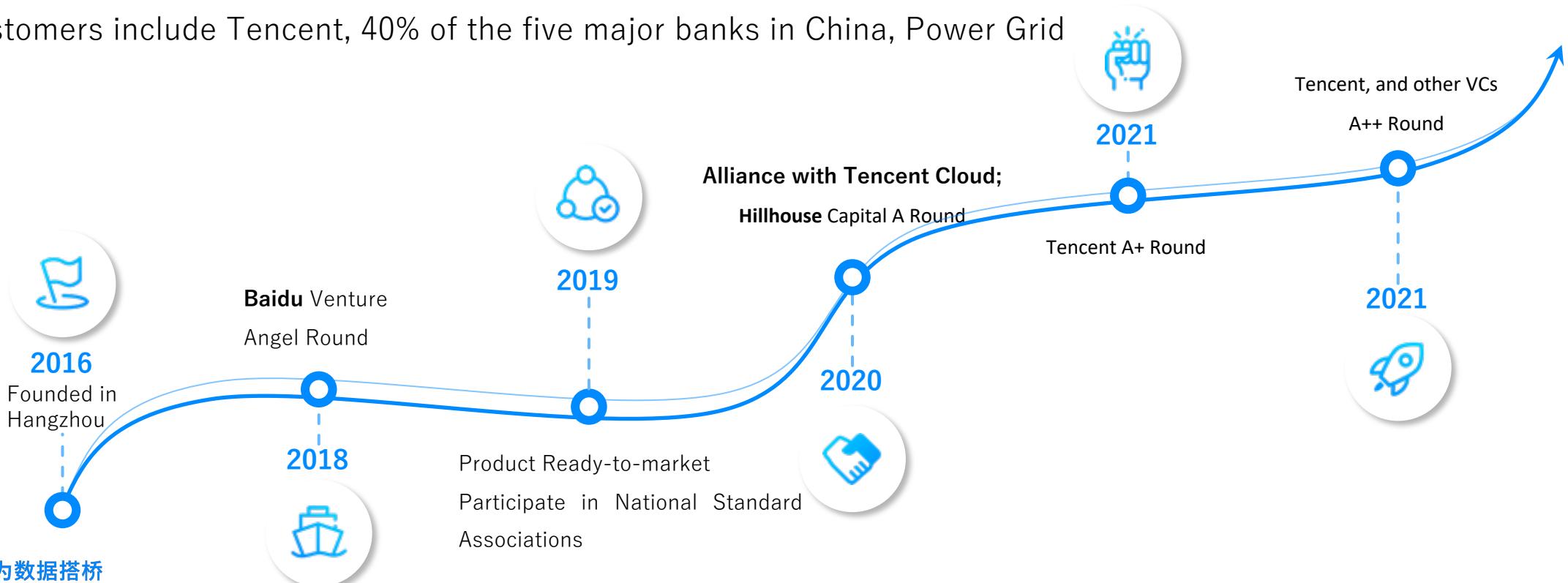


Core product **Galaxybase** is a native high-performance graph platform provide one step solution to large scale graph data store and computation

**Galaxybase** is the current **LDBC-SNB** world record holder

**Galaxybase** is the current **largest-scale graph** record holder, 5-trillion graph

Customers include Tencent, 40% of the five major banks in China, Power Grid



# Enterprise Performance



## Patents

There are a number of patents related to the existing graph technology.

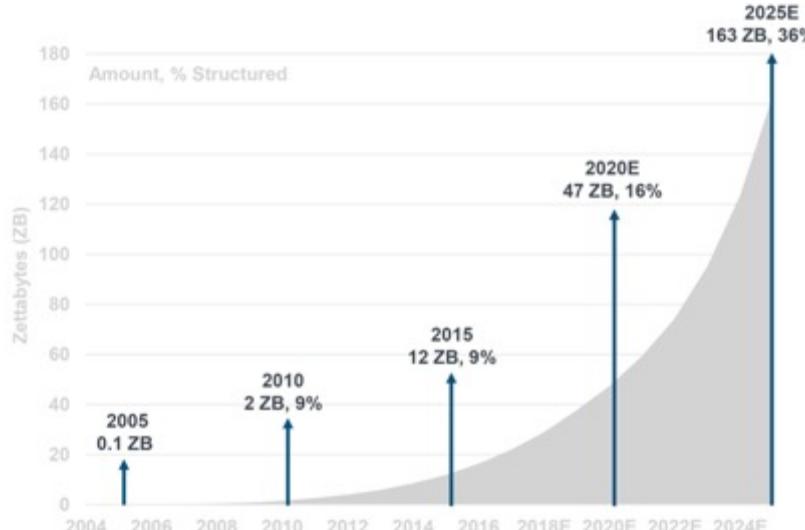


## Industry Recognition

- August 2019      Won the Amazon Cloud 2019 AI Fusion Award.
- September 2019      Appraised as an influential enterprise in the field of Internet + knowledge graph deep mining and an excellent solution enterprise in the field of graph data storage.
- October 2020      Awarded "[the most influential enterprise in the field of graph database in 2020](#)" and "[the best solution enterprise in the field of graph database in 2020](#)" by CCIDnet.
- December 2020      Awarded the 2020 Data Wind and Cloud Award for Annual Innovative Enterprises.
- January 2021      Won the Excellent Solution Award for IT Services of Commercial Banks.
- July 2021      Awarded "China's New Economy Unicorn & Quasi-Unicorn 2021".
- August 2021      Became a board member International Linked Data Benchmarking Committee (LDBC).
- January 2022      [Won the best fundamental product of Tencent Yunqi in 2021](#).
- January 2022      Awarded "[Leading Enterprise of Domestic Commercial Graph Database in 2021](#)" and "[Best Domestic Commercial Graph Database Product in 2021](#)" by CCIDnet.
- May 2022      Participated in the development of the benchmark technical specifications for the FIE-1 Energy Industry Graph Database.

# The Value of Graph Technology

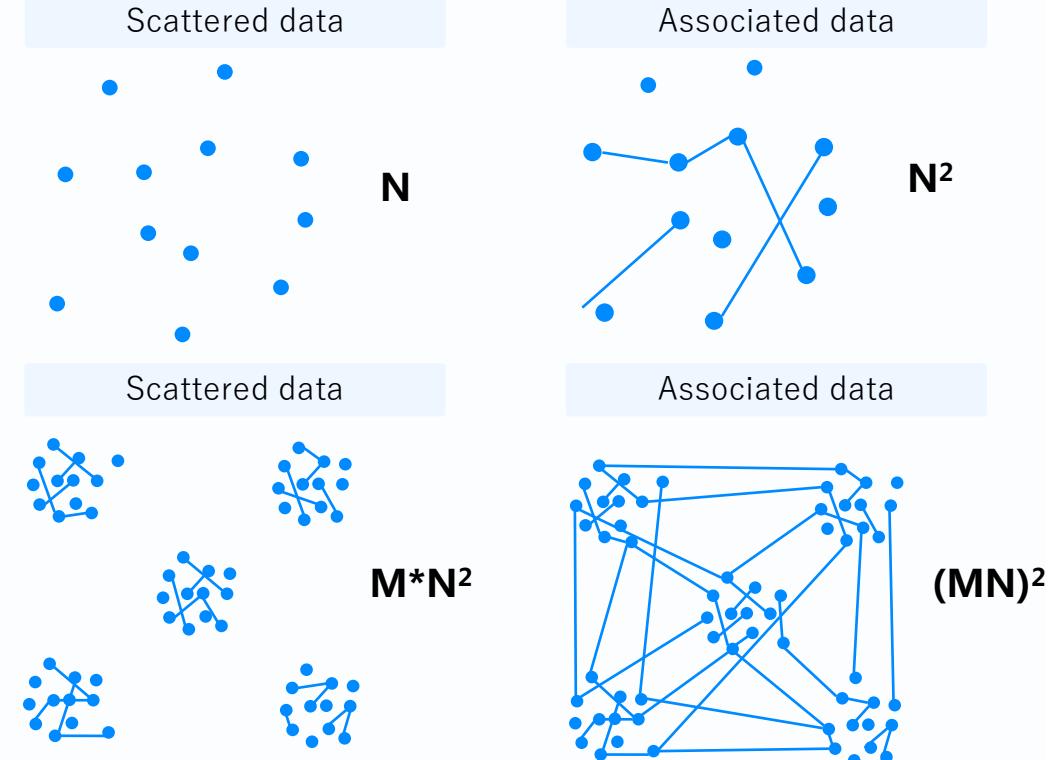
The value of big data lies in the discovery and application of relationships and data patterns, while the graph database is the intuitive storage of data relationships.



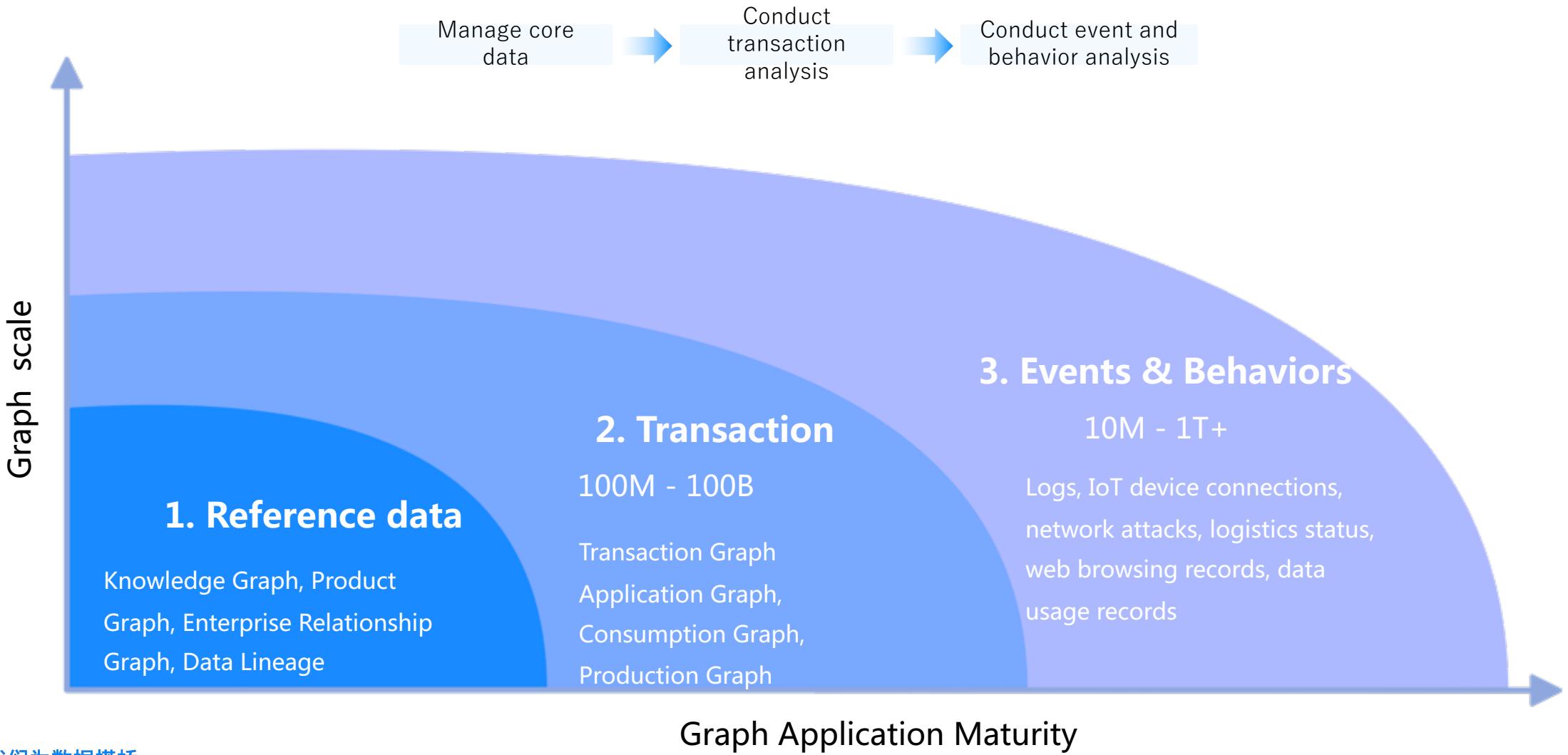
The total amount of global data is expected to increase by more than 80 times in 2025 compared with 2010.

The value of data has been highly valued, from the previous value mining of a small number of isolated data to the value mining of massive global data.

## Exponential Growth of Graph Data Value



# The Development History of Graph Application



# Galaxybase Advantage-Excellent Performance in IC



Galaxybase has the best Interactive query performance  
and the more complex the query, the greater the performance benefit.

## LDBC SNB

The most complete benchmark of graph databases in social network scenarios so far.

| SF100 Dataset Test Results   |          |                        |                     |  |   |  |
|--|----------|------------------------|---------------------|--|---|--|
| Test environment: 24-core 2.5GHz CPU, 372G memory, gigabit network broadband, 2 * 900GB mechanical hard disk |          |                        |                     |  |   |  |
| Item   | Quantity | Galaxybase v3.3.0 Fast | TuGraph v0.3.3 Fast | Average response time compare to TuGraph | Faster than TuGraph in response time by |  |
| Interactive Complex Query (IC)   | 14       | 100%                   | 0%                  | 6.1 times                                | 54.1 times                              |  |
| Interactive Simple Query (IS)  | 7        | 100%                   | 0%                  | 4.7 times                                | 11.2 times                              |  |
| Interactive Inserts (II)   | 8        | 100%                   | 0%                  | 9.7 times                                | 72.6 times                              |  |
| Total  | 29       | 100%                   | 0%                  | 6.7 times                                | 72.6 times                              |  |

Test data set: SF100 data set, 280 million vertexes, 1.78 billion edges

## Breaking LDBC SNB

### World record

70% increase in throughput

Average 6X improvement in query performance

Up to 72X improvement in query performance

GENERAL TERMS  
Executive Summary  
Galaxybase is a proprietary graph database product developed by CreateLink. This document describes an independent audit of Galaxybase. The audit tested and loaded the entire queries with random vertexes with random edge types. The test results show significant improvements in processing properties during each update. Net local sockets.

Declaration of Audit Success  
This report contains an audited LDBC benchmark run. The results have been gathered by an independent and impartial auditor who has evaluated the implementation of the queries, successfully run the ACID tests associated with the claimed isolation level (serializable), and verified the overall system's configuration conformance to the description of the benchmark and its strict requirements.

Signature: Dr. Martin Butz (Auditor) Date: 5/25/2013  
Signature: Dr. Gabor Szekely (Head of LDBC SNB Task Force) Date: 5/25/2013  
Signature: Dr. Yan Zheng (Sino-Sponsor Representative) Date: 5/25/2013

Complete test report:  
<https://ldbcouncil.org/benchmarks/snbs/>.

# The Galaxybase Advantage-Superior Horizontal Scalability



最前线 | 创邻科技Galaxybase图数据库完成5万亿规模交易数据智能挖掘

王与桐 · 2022-01-25

关注

打破世界纪录

2021年11月底工信部印发《“十四五”软件和信息技术服务业发展规划》，明确提出“突破大规模并行图数据处理关键技术”，推动高性能数据库在金融、电信、能源、制造等重点行业关键业务系统应用。图数据库作为以图论为设计原理的数据库管理系统，将现实世界的实体和实体关系抽象表达为顶点和边，擅长海量图数据的高效存储、查询、计算、分析，能有效解决传统数据库技术无法解决的大数据关联难题，在金融风险、精准零售、物流优化、能源调度、生物制药、智能交通、疫情防控等多种新兴领域有巨大的应用价值。其解决了传统技术关联查询效率低、成本高的问题，具有丰富、高效和敏捷的数据处理能力。而伴随全球数字化竞赛日趋白热化，这将直接影响企业数字化、智能化进程。

## Breaking the Scale of Graph Data Processing World Record

- 5 trillion large-scale graph distributed storage, real-time online query
- Covers super nodes with a maximum outgoing edges of more than **10 million**.
- 6-hop deep link query averaging 6.7 s
- Uses only 50 machine cluster

# Galaxybase: Graph platform for storage, computation, and analytics



## Customer pain points

Slow query speed and poor business experience

Poor scalability and difficulty in data increment

Large data expansion and high hardware cost

High ETL and time cost for graph computation

Slow start and high learning cost



**Fast:** Native distributed parallel graph storage with millions of neighbors returned in 1 second.



**High scalability:** Fully distributed architecture, dynamic online capacity expansion, and efficient support for trillion-level super large graphs.

**Graph Storage**



**Efficient data compression:** Optimize resource utilization, 3-5X save on hardware and maintenance costs.



**Real-time computation:** Built-in rich distributed graph algorithm and real-time graph analysis without ETL.

**Graph Computation**



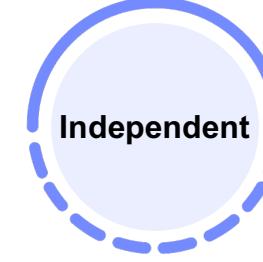
**Visual analysis without programming:** the business is easy to understand and the technical value is realized quickly.

**Graph Analytics**

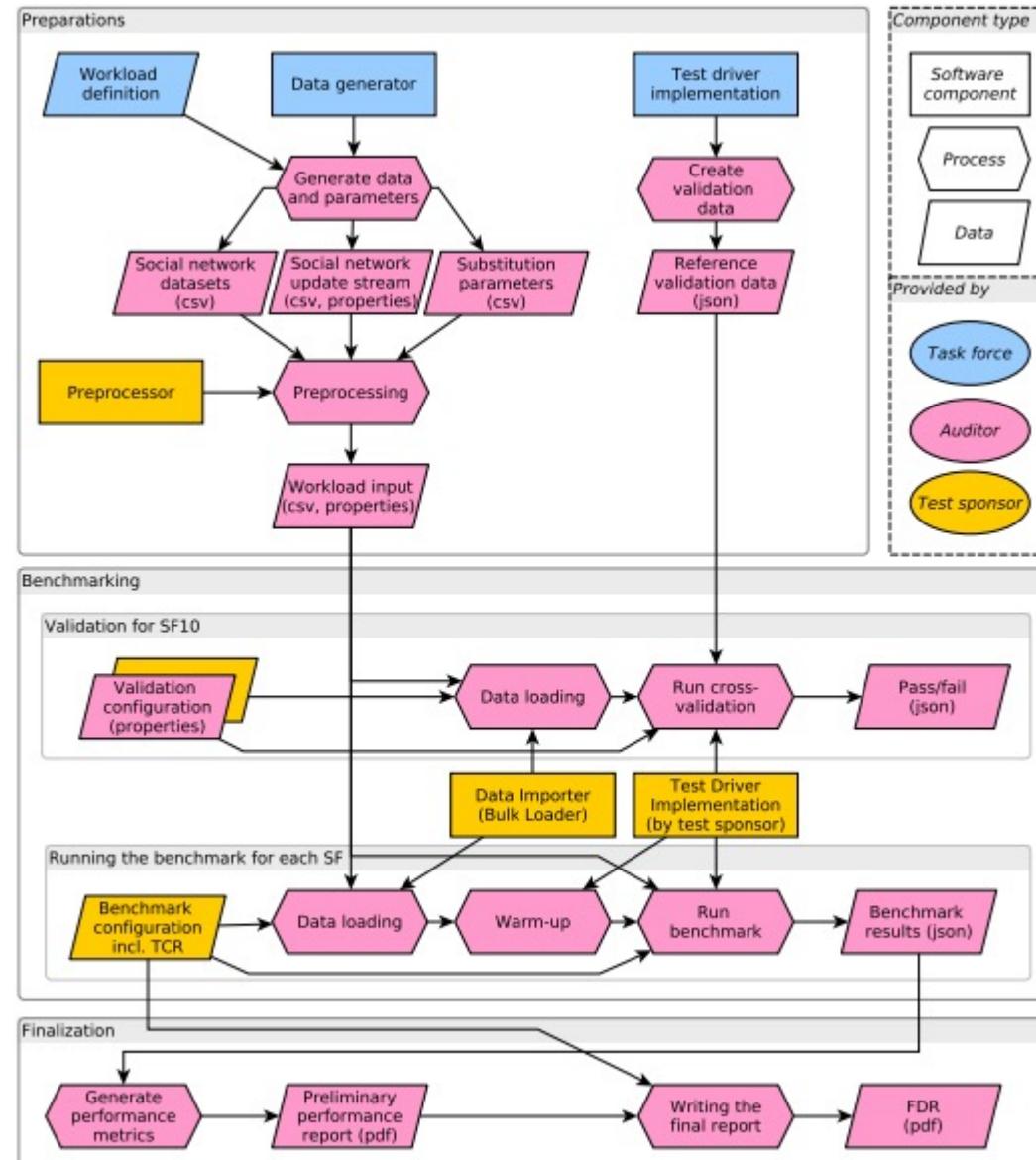
# Why Choose LDBC?

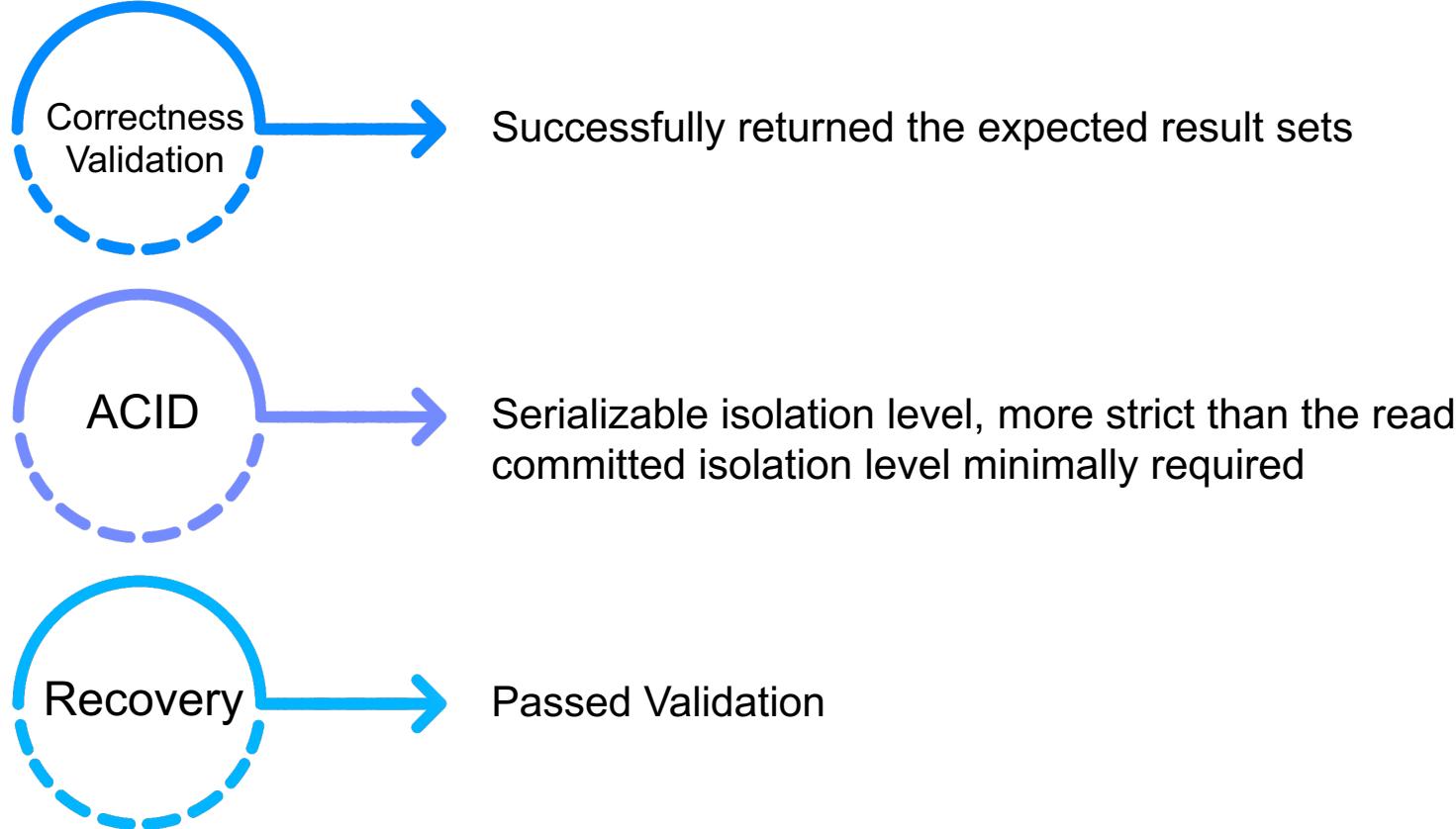


The Linked Data Benchmark Council (LDBC) is a non-profit organization aiming to define standard graph benchmarks to foster a community around graph processing technologies. LDBC consists of members from both industry and academia, including organizations and individuals. Successfully served many leading customers in finance, energy, Internet and other industries, and supports super large graph online with trillions of nodes and edges.



# LDBC Benchmark Procedure





# LDBC Performance Testing Method



95% on-time requirement :

`actual_start_time - scheduled_start_time < 1 second`

The measurement window :



The key configuration :

```
thread_count=48  
time_compression_ratio=0.0038  
warmup=19000000  
operation_count=75000000
```

# LDBC Performance Testing Results



## Performance summary:

- Duration
- Operations
- Throughput
- Query on-time compliance

## Detailed performance:

- Count
- Mean
- 50th Percentile
- 90th Percentile
- 95th Percentile
- 99th Percentile

# LDBC SNB Record



Before Galaxybase, the holder of the LDBC-SNB record was TuGraph in 2020.

| System details          | Previous            |
|-------------------------|---------------------|
| Cloud Provider          | Amazon Web Services |
| Instance Type           | r5d.12xlarge        |
| Operating System        | 18.04.1-Ubuntu      |
| CPU Count/Cores/Threads | 1/24/48             |
| Memory Size             | 374GB               |
| Storage                 | 2 x 900GB NVMe SSD  |

| Throughput | Previous |
|------------|----------|
| sf30       | 5436.37  |
| sf100      | 5010.77  |
| sf300      | 4855.52  |

# Galaxybase LDBC SNB Official Audit



In this LDBC-SNB audit, Galaxybase selects the same system configuration with TuGraph.

| System details          | Previous            | Galaxybase          |
|-------------------------|---------------------|---------------------|
| Cloud Provider          | Amazon Web Services | Amazon Web Services |
| Instance Type           | r5d.12xlarge        | r5d.12xlarge        |
| Operating System        | 18.04.1-Ubuntu      | 18.04.1-Ubuntu      |
| CPU Count/Cores/Threads | 1/24/48             | 1/24/48             |
| Memory Size             | 374GB               | 372GB               |
| Storage                 | 2 x 900GB NVMe SSD  | 2 x 900GB NVMe SSD  |

# Galaxybase LDBC SNB Official Audit



Galaxybase throughput increases by 70%.

| Throughput | Previous | Galaxybase | Rate of increase |
|------------|----------|------------|------------------|
| sf30       | 5436.37  | 9285.86    | 70.8%            |
| sf100      | 5010.77  | 8501.21    | 69.7%            |
| sf300      | 4855.52  | 8370.52    | 72.4%            |

# Galaxybase LDBC SNB Official Audit SF100 Result



The response time of Galaxybase is faster than the previous record in all aspects.

|          | Mean response time |            |              | 50% response time |            |              | 90% response time |            |              | 95% response time |            |              | 99% response time |            |              |
|----------|--------------------|------------|--------------|-------------------|------------|--------------|-------------------|------------|--------------|-------------------|------------|--------------|-------------------|------------|--------------|
| Database | Previous           | Galaxybase | ratio        | Previous          | Galaxybase | ratio        | Previous          | Galaxybase | ratio        | Previous          | Galaxybase | ratio        | Previous          | Galaxybase | ratio        |
| IC1      | 137.11             | 23.10      | <b>5.93</b>  | 70.22             | 7.04       | <b>9.98</b>  | 253.84            | 9.80       | <b>25.90</b> | 792.77            | 229.63     | <b>3.45</b>  | 959.94            | 274.70     | <b>3.49</b>  |
| IC2      | 5.73               | 1.64       | <b>3.49</b>  | 4.58              | 1.19       | <b>3.86</b>  | 8.44              | 1.75       | <b>4.82</b>  | 11.88             | 2.10       | <b>5.67</b>  | 28.65             | 6.41       | <b>4.47</b>  |
| IC3      | 93.50              | 54.66      | <b>1.71</b>  | 90.28             | 50.94      | <b>1.77</b>  | 117.80            | 66.13      | <b>1.78</b>  | 123.47            | 73.92      | <b>1.67</b>  | 178.90            | 140.02     | <b>1.28</b>  |
| IC4      | 8.69               | 2.91       | <b>2.99</b>  | 7.02              | 2.26       | <b>3.11</b>  | 15.11             | 3.98       | <b>3.79</b>  | 17.55             | 4.70       | <b>3.73</b>  | 34.27             | 9.81       | <b>3.49</b>  |
| IC5      | 1280.00            | 230.11     | <b>5.56</b>  | 1306.43           | 225.29     | <b>5.80</b>  | 1717.95           | 321.10     | <b>5.35</b>  | 1823.30           | 361.58     | <b>5.04</b>  | 2000.06           | 435.10     | <b>4.60</b>  |
| IC6      | 28.89              | 7.54       | <b>3.83</b>  | 22.22             | 7.99       | <b>2.78</b>  | 61.35             | 15.30      | <b>4.01</b>  | 66.50             | 17.31      | <b>3.84</b>  | 80.12             | 31.88      | <b>2.51</b>  |
| IC7      | 1.98               | 0.52       | <b>3.81</b>  | 0.73              | 0.10       | <b>7.12</b>  | 4.41              | 0.26       | <b>17.28</b> | 7.66              | 0.36       | <b>21.16</b> | 21.50             | 4.18       | <b>5.14</b>  |
| IC8      | 1.75               | 0.54       | <b>3.25</b>  | 0.55              | 0.13       | <b>4.14</b>  | 3.99              | 0.21       | <b>18.73</b> | 7.24              | 0.29       | <b>25.30</b> | 20.75             | 4.22       | <b>4.92</b>  |
| IC9      | 600.30             | 151.06     | <b>3.97</b>  | 586.75            | 144.91     | <b>4.05</b>  | 788.29            | 204.51     | <b>3.85</b>  | 845.09            | 249.15     | <b>3.39</b>  | 956.48            | 312.83     | <b>3.06</b>  |
| IC10     | 131.85             | 50.10      | <b>2.63</b>  | 129.34            | 48.15      | <b>2.69</b>  | 168.14            | 59.88      | <b>2.81</b>  | 181.22            | 66.51      | <b>2.72</b>  | 227.09            | 126.26     | <b>1.80</b>  |
| IC11     | 41.33              | 1.12       | <b>36.90</b> | 40.21             | 0.71       | <b>57.04</b> | 49.93             | 0.92       | <b>54.15</b> | 53.25             | 1.09       | <b>48.68</b> | 92.36             | 5.34       | <b>17.29</b> |
| IC12     | 94.91              | 30.22      | <b>3.14</b>  | 92.60             | 28.27      | <b>3.28</b>  | 127.37            | 40.13      | <b>3.17</b>  | 139.82            | 46.35      | <b>3.02</b>  | 180.70            | 90.18      | <b>2.00</b>  |
| IC13     | 3.86               | 1.09       | <b>3.53</b>  | 2.91              | 0.62       | <b>4.72</b>  | 6.71              | 1.26       | <b>5.33</b>  | 10.12             | 1.45       | <b>6.97</b>  | 24.79             | 5.60       | <b>4.43</b>  |
| IC14     | 34.98              | 8.06       | <b>4.34</b>  | 6.75              | 1.33       | <b>5.07</b>  | 108.44            | 23.92      | <b>4.53</b>  | 127.88            | 28.99      | <b>4.41</b>  | 186.62            | 54.06      | <b>3.45</b>  |

# Galaxybase LDBC SNB Official Audit SF100 Result



The response time of Galaxybase is faster than the previous record in all aspects.

|          | Mean response time |            |       | 50% response time |            |       | 90% response time |            |       | 95% response time |            |       | 99% response time |            |       |
|----------|--------------------|------------|-------|-------------------|------------|-------|-------------------|------------|-------|-------------------|------------|-------|-------------------|------------|-------|
| Database | Previous           | Galaxybase | ratio | Previous          | Galaxybase | ratio | Previous          | Galaxybase | ratio | Previous          | Galaxybase | ratio | Previous          | Galaxybase | ratio |
| IS1      | 0.58               | 0.09       | 6.17  | 0.28              | 0.06       | 4.74  | 0.91              | 0.08       | 11.20 | 2.22              | 0.10       | 23.37 | 5.53              | 0.40       | 13.79 |
| IS2      | 0.76               | 0.24       | 3.25  | 0.47              | 0.18       | 2.61  | 1.23              | 0.32       | 3.87  | 2.32              | 0.44       | 5.29  | 5.71              | 0.84       | 6.82  |
| IS3      | 1.40               | 0.68       | 2.07  | 0.85              | 0.36       | 2.36  | 3.43              | 1.26       | 2.73  | 5.05              | 2.99       | 1.69  | 7.54              | 4.74       | 1.59  |
| IS4      | 0.59               | 0.11       | 5.38  | 0.29              | 0.07       | 4.01  | 0.94              | 0.10       | 9.65  | 2.27              | 0.11       | 20.07 | 5.60              | 0.44       | 12.63 |
| IS5      | 0.55               | 0.10       | 5.76  | 0.26              | 0.07       | 3.94  | 0.83              | 0.09       | 9.14  | 2.06              | 0.10       | 19.99 | 5.43              | 0.30       | 17.99 |
| IS6      | 0.56               | 0.10       | 5.64  | 0.27              | 0.07       | 3.79  | 0.83              | 0.10       | 8.77  | 2.06              | 0.11       | 19.05 | 5.45              | 0.30       | 18.49 |
| IS7      | 0.65               | 0.13       | 4.95  | 0.37              | 0.10       | 3.85  | 0.96              | 0.16       | 5.88  | 2.17              | 0.19       | 11.20 | 5.58              | 0.37       | 15.26 |
| II1      | 4.24               | 1.18       | 3.59  | 2.29              | 0.31       | 7.47  | 10.54             | 1.44       | 7.34  | 15.72             | 2.91       | 5.40  | 30.09             | 12.18      | 2.47  |
| II2      | 1.89               | 0.23       | 8.14  | 0.90              | 0.08       | 11.34 | 4.25              | 0.11       | 39.73 | 6.35              | 0.14       | 45.06 | 14.48             | 2.06       | 7.02  |
| II3      | 1.93               | 0.23       | 8.33  | 0.92              | 0.08       | 11.59 | 4.35              | 0.11       | 40.64 | 6.41              | 0.14       | 44.85 | 14.60             | 2.20       | 6.63  |
| II4      | 3.34               | 0.32       | 10.42 | 0.96              | 0.14       | 6.72  | 11.62             | 0.20       | 56.96 | 15.40             | 0.31       | 50.50 | 20.82             | 2.29       | 9.11  |
| II5      | 2.13               | 0.25       | 8.37  | 1.16              | 0.10       | 11.69 | 4.45              | 0.15       | 28.87 | 6.68              | 0.21       | 31.66 | 15.15             | 2.12       | 7.15  |
| II6      | 6.50               | 0.31       | 21.23 | 3.18              | 0.17       | 19.15 | 16.69             | 0.23       | 72.56 | 18.92             | 0.28       | 67.57 | 24.25             | 1.65       | 14.74 |
| II7      | 4.15               | 0.32       | 13.00 | 1.24              | 0.16       | 7.92  | 13.84             | 0.21       | 66.56 | 16.82             | 0.26       | 65.94 | 21.83             | 2.09       | 10.46 |
| II8      | 5.68               | 1.34       | 4.25  | 3.24              | 0.53       | 6.10  | 12.54             | 2.90       | 4.33  | 20.13             | 5.38       | 3.74  | 37.07             | 10.76      | 3.45  |

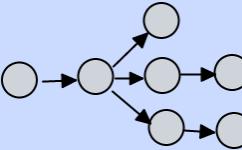
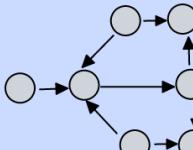
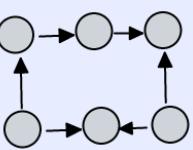
# Galaxybase LDBC SNB Official Audit



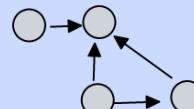
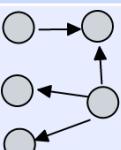
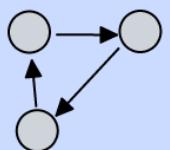
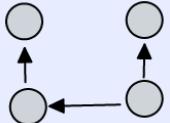
The average response time more than 6 times faster and the best response time is more than 72 times faster.

| Item  | Average response time compare to Previous Record Holder | Faster than Previous Record Holder in response time by |
|-------|---|--|
| sf30  | 6.0 times   | 49.24 times  |
| sf100 | 6.7 times   | 72.6 times   |
| sf300 | 6.4 times   | 58.7 times   |
| Total | 6.4 times   | 72.6 times   |

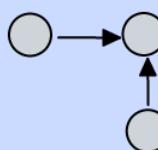
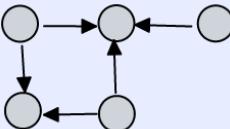
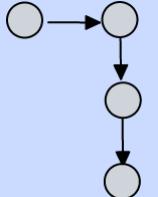
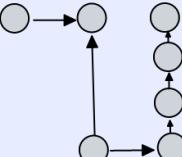
# Test Items

| Item | Title  | Pattern  | Choke Points   |
|------|--|--|--|
| IC1  | Transitive friends with certain name                             |    | Rich join order optimization<br>Intra-query result reuse                               |
| IC2  | Recent messages by your friends                                  |    | Interesting orders<br>Late projection<br>Join type selection<br>Dimensional clustering |
| IC3  | Friends and friends of friends that have been to given countries |    | Rich join order optimization<br>Detecting correlation<br>Flattening sub-queries        |
| IC4  | New topics   |  | Join type selection  |

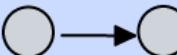
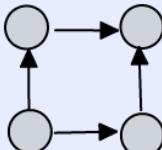
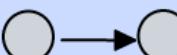
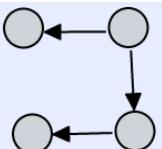
# Test Items

| Item | Title             | Pattern   | Choke Points  |
|------|-------------------|---|---|
| IC5  | New groups        |   | Sparse foreign key joins<br>Scattered index access patterns   |
| IC6  | Tag co-occurrence |  | Flattening sub-queries  |
| IC7  | Recent likers     |   | Late projection<br>Join type selection<br>Scattered index access patterns<br>Flattening sub-queries |
| IC8  | Recent replies    |  | Sparse foreign key joins<br>Scattered index access patterns<br>Intra-query result reuse             |

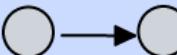
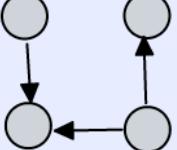
# Test Items

| Item | Title  | Pattern  | Choke Points   |
|------|--|--|--|
| IC9  | Recent messages by friends or friends of friends |    | Interesting orders<br>High cardinality group-by performance<br>Late projection<br>Join type selection<br>Dimensional clustering<br>Scattered index access patterns   |
| IC10 | Friend recommendation                            |    | Join type selection<br>Scattered index access patterns<br>Common subexpression elimination<br>Complex boolean expression joins and selections<br>Flattening sub-queries<br>Overlap between outer and sub-query<br>Inter-query result reuse<br>Incremental path computation |
| IC11 | Job referral                                     |   | Top-k pushdown<br>Join type selection<br>Sparse foreign key joins<br>Scattered index access patterns<br>Complex boolean expression joins and selections  |
| IC12 | Expert search                                    |  | Scattered index access patterns<br>Cardinality estimation of transitive paths<br>Execution of a transitive step  |

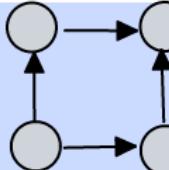
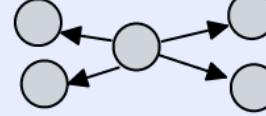
# Test Items

| Item | Title                       | Pattern  | Choke Points   |
|------|-----------------------------|--|--|
| IC13 | Single shortest path        |   | Scattered index access patterns<br>Cardinality estimation of transitive paths<br>Execution of a transitive step<br>Unweighted shortest paths   |
| IC14 | Trusted connection paths    |   | Scattered index access patterns<br>Intra-query result reuse<br>Cardinality estimation of transitive paths<br>Execution of a transitive step<br>Unweighted shortest paths<br>Composition of graph queries |
| IS1  | Profile of a person         |   | Query node<br>Query edge   |
| IS2  | Recent messages of a person |  | Query node<br>Query edge   |

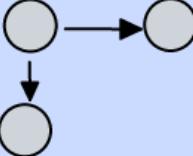
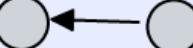
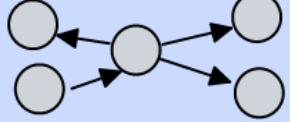
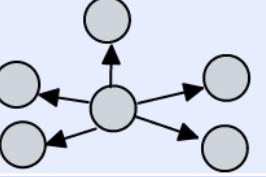
# Test Items

| Item | Title                | Pattern  | Choke Points             |
|------|----------------------|--|--------------------------|
| IS3  | Friends of a person  |   | Query node<br>Query edge |
| IS4  | Content of a message |   | Query node               |
| IS5  | Creator of a message |   | Query node<br>Query edge |
| IS6  | Forum of a message   |  | Query node<br>Query edge |

# Test Items

| Item            | Title                | Pattern   | Choke Points               |
|-----------------|----------------------|---|----------------------------|
| I <sub>7</sub>  | Replies of a message |  | Query node<br>Query edge   |
| II <sub>1</sub> | Add person           |  | Insert node<br>Insert edge |
| II <sub>2</sub> | Add like to post     |  | Insert edge                |
| II <sub>3</sub> | Add like to comment  |  | Insert edge                |

# Test Items

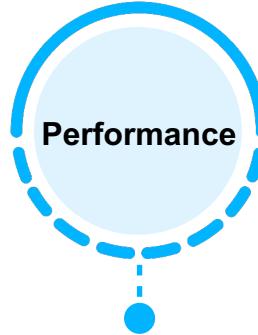
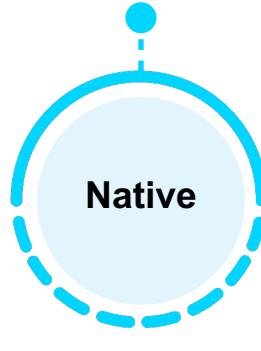
| Item | Title                | Pattern   | Choke Points               |
|------|----------------------|---|----------------------------|
| II4  | Add forum            |    | Insert node<br>Insert edge |
| II5  | Add forum membership |    | Insert edge                |
| II6  | Add post             |    | Insert node<br>Insert edge |
| II7  | Add comment          |   | Insert node<br>Insert edge |
| II8  | Add friendship       |  | Insert edge                |

# Technical Advantages



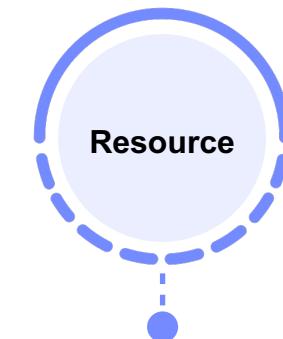
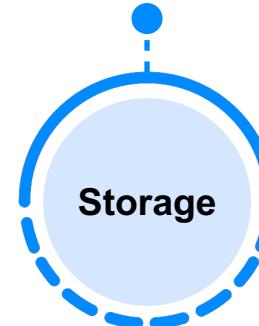
Storage advantage: Galaxybase uses an innovative proprietary native graph datastore.

The core datastore engine does not rely on any third-party open-source components.



Customized optimization for index-free adjacency of graph data.

To efficiently organize memory data through its proprietary memory allocation and management mechanism.

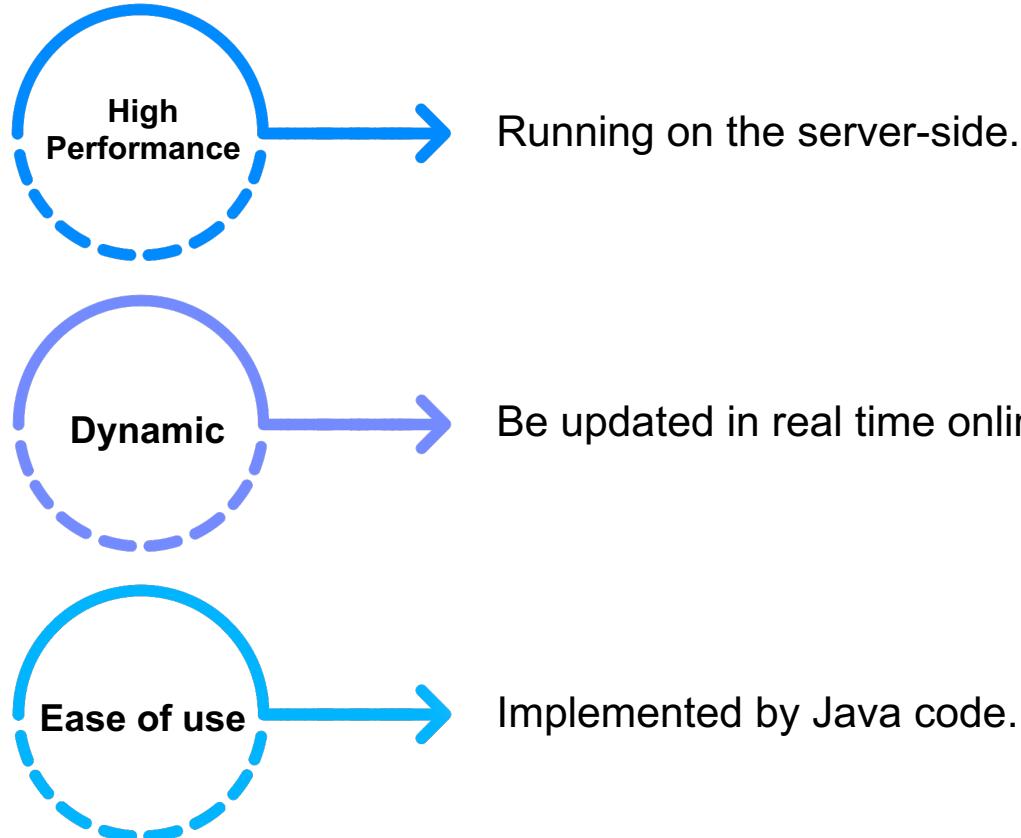


Adaptively allocates the number of threads for parallel iterations based on the number of neighbours during neighbour iteration to achieve best utilization of system resources.

# Technical Advantages



Development advantage: PAR (Parameterized Algorithm Routine) API.



# Galaxybase Advantage-Easy-to-Use Graph Analysis Window



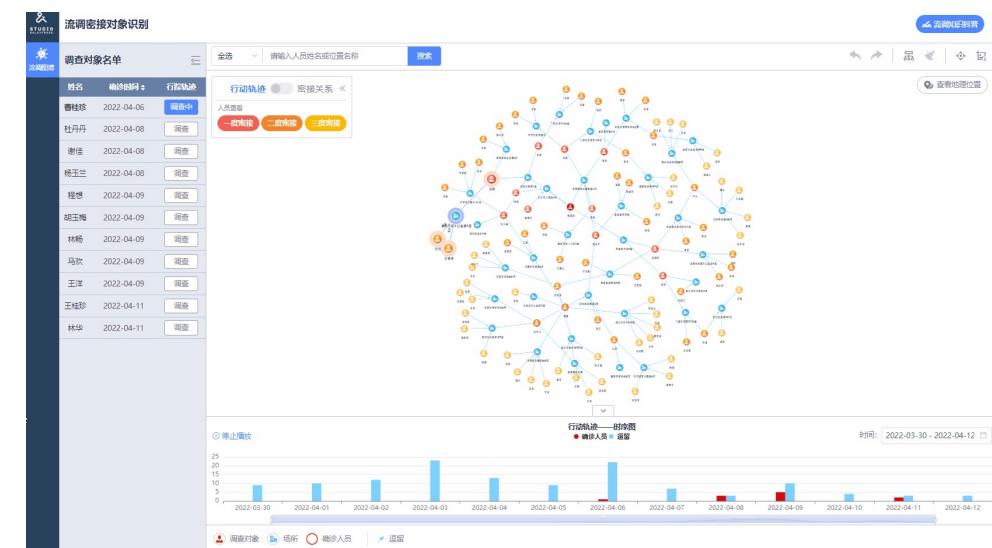
Multiple layout views, custom graph styles and dynamic zooming in/out to meet the requirements of high-precision multi-dimensional analysis;  
Highly complex relationship analysis can also be done by simply dragging and clicking;  
Analysis results can be exported in multiple formats.



Path Finding



Time Series Analysis of Community Evolution



# Success Story-IoT Analysis



## Pain Points

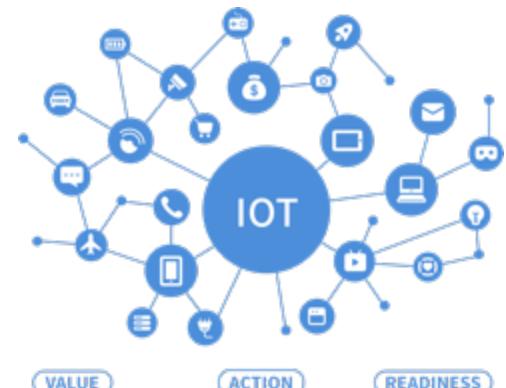
Fall short of responding in real time with the change of time and space for intelligent scheduling decision-making, transportation, tourism and so on;  
Huge volumes of mobile data, long processing time, low query efficiency, and high hardware cost

## Solutions

Build an IoT network based on device, WIFI hotspot, and ID information, for analysis of co-appearance and other cases, in support of its banking, government and public security customers;  
300TB original data;  
5.4 billion vertexes, 3.75 trillion edges and 18.77 trillion properties;  
Data loading speed: 15 billion edges/hour, 72.5 billion properties/hour.

## Business Value

- ✓ Efficiently store, query and daily increase data;
- ✓ Reduce cost by 500% (420 TB) and save millions of hardware costs and operation and maintenance expenses.



# Success Story-Fraud Detection



## Pain Points

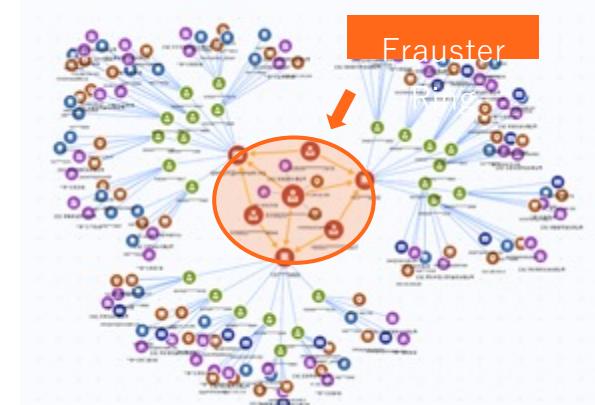
Insufficient fraud black sample;  
Static expert rules falling short of detecting dynamic and changeable fraud means;  
Long time taken by manual verification

## Solutions

Build a user network of related entities (contacts, phone, address, company, IP, email, etc.) with various types of relationships (guarantor, transaction, family member, work address, etc. ) for varies fraud detection cases.

## Business Value

Save manual audit cost and improve audit efficiency;  
Improve the accuracy of fraud identification and reduce misjudgments;  
Discover risks in advance, take precautions in advance and reduce losses.



# Adopters and Partners

## • Adopters



Tencent 腾讯

## Partners



WE CONNECT THE DOTS



THANKS FOR WATCHING



info@chuanglintech.com

