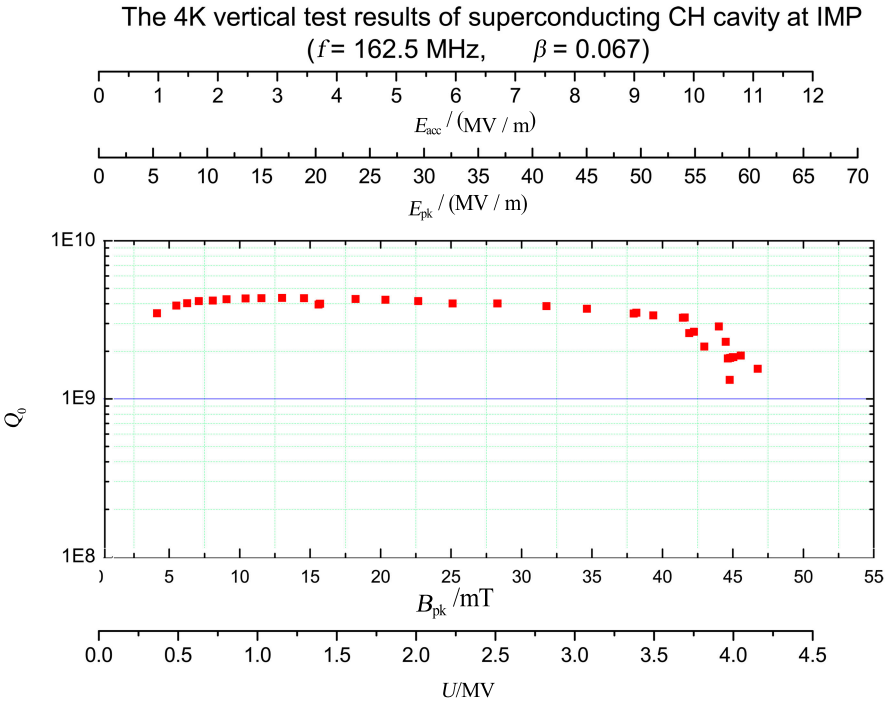

Fig. 1 (color online) The 4K vertical test results of superconducting CH cavity at IMP.

The maximum peak electric field of superconducting CH cavity have reached 61 MV/m. The accelerating gradient is 11 MV/m, corresponding quality factor Q_0 is better than 1.5×10^9. The accelerating voltage is 4.1 MV.

References

[1] Mengxin XU, Yuan He, et al., Chinese Physics C, 2(2015)027005.

[2] Mengxin Xu, Yuan He, Shenghu Zhang, et al., Chinese Physics C, 5(2015)057009.

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6 - 13 Channelfinder and Elasticsearch Benchmark

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DISCS (Distributed Information Services of Control System)[1] is a collaborative effort between BNL, FRIB, Cosylab, IHEP, and ESS. It's a database-driven software services and applications that any experimental physics facility can easily configure, use, and extend for its commissioning, operation, and maintenance. Channelfinder and Elasticsearch are all the important components of DISCS. Channelfinder is a directory server, implemented as a REST style web service. Its intended use is within control systems, namely the EPICS Control system, for which it has been written. Elasticsearch is a distributed, open source search and analytics engine, designed for horizontal scalability, reliability, and easy management. It combines the speed of search with the power of analytics via a sophisticated, developer-friendly query language covering structured, unstructured, and time-series data. The Elasticsearch act as a search service in DISCS ecosystem. Although the Channelfinder and the Elasticsearch are different module of the DISCS, they all have data querying function. So we want to know which one is more faster in data querying.

Fig. 1 below shows the benchmark solution of Channelfinder and Elasticsearch. The Channelfinder and the Elasticsearch have their own Python Client API, so we developed the Python client application for testing. These two Python application are very similar, and their testing methods are the same. The data source of the benchmark consists of 100 thousands PVs. Each PV has about 260 properties and tags totally. The data structure for Channelfinder is the table of MySQL and the data structure for Elasticsearch is JSON. The Table 1 shows the test

environment. The Figs. 2 and 3 show the testing results. Through these testing results, we know that Elasticsearch's querying performance is better than Channelfinder's.

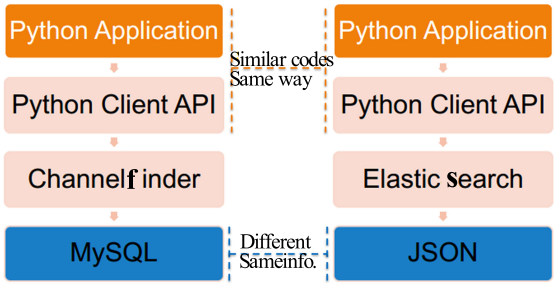

Fig. 1 (color online) Benchmark Solution of Channel.

Table 1 Test environment

PC	Processor	Intel®Core™ i5-3570
	Memory	8 G
	OS	Windows 7 Professional (64bit)
VirtualBox	Version	4.3.6
Debian on VirtualBox	Version	Debian GNU/Linux 7.0 (Wheezy)
	Memory	4 G
	Storage	100 G
	Desktop	Xfce 4.8
Channel finder	Channelfinder 1.1.1	
	Glassfish 3.1.1	
	MySQL Community Server 5.6.16	
	JDBC for MySQL 5.1.30	
Elastic search	Version	1.0.1

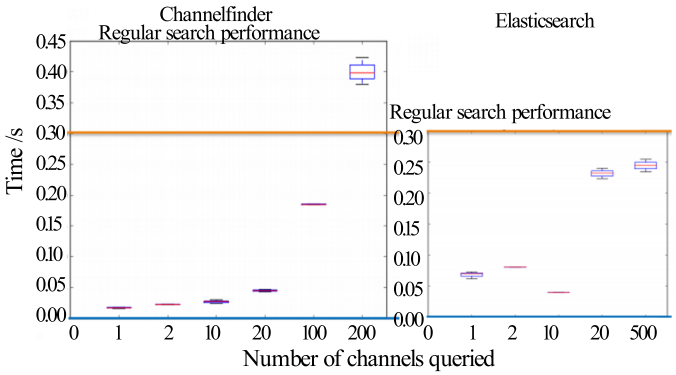

Fig. 2 (color online) Regular search performance.

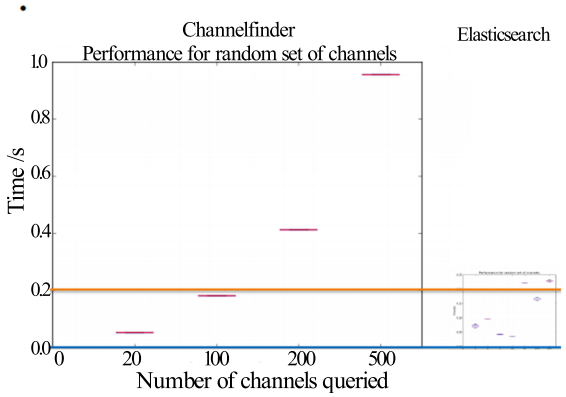

Fig. 3 (color online) Random search performance.

The work was done when the author was at FRIB. Many thanks to all the colleagues of the FRIB controls and computing department for their support and cooperation. Many thanks have also to be addressed to Guobao Shen, Ralph Lange and KunalShroff for their valuable help.

Reference

[1] DISCS home pagehttp://openepics.sourceforge.net/about-discs/