# Utilizing the Annual Reports

## Introduction

This paper is part of an on-going series of industry reports published by the QuEST Forum based on TL 9000 Performance Data Reports (PDRs). These PDRs include valuable benchmark data including industry statistics such as Industry Average, Best-in-Class, and Worst-in-Class. These are based on anonymously provided monthly data to the University of Texas-Dallas by TL 9000 certified companies around the globe, spanning today's ICT technologies and services.

Past papers have demonstrated numerous cases where measurements such as on-time delivery, return rates, problem reports, fix response time and service quality have shown significant improvement. These results support a founding pillar of the QuEST Forum which was that the use of the PDR benchmarks to drive continual improvement would have a positive impact on overall ICT industry quality. The PDRs also proved valuable in showing industry trouble spots, such as degrading on-time delivery due to exploding demand and its strain on the supply chain.

The PDR Strategic Initiative team is taking a different approach in this paper, focusing instead on the impact their on-going efforts are having on improving the accuracy of the TL 9000 data. While it is recognized that field data always has its challenges, the team took a proactive approach in addressing suspicious data, and the efforts are paying off. This paper showcases the impact on the very important router products that are pervasive in today's networks.

## Data from 2012-2014 Annual Reports

It is important to remember that TL 9000 data is real data and real data will contain errors. Normally, the data is usable despite the small errors. Sometimes, however, the data is so erroneous that it becomes unusable. The annual TL 9000 PDR report is a vehicle to help Quest Forum members understand these errors. If used in conjunction with the Quest Forum PDR Team, such errors can be corrected, and the data can be made useable.

If the data is so erroneous that it is unusable, at least one organization is most likely either reporting in the wrong product category or misunderstands the measurement. The easiest way to check the wrong product category theory is to examine the annual PDR report. Unlike the monthly report, which only contains the industry best, average, and worst values for the measurement, the annual report also provides the aggregate denominator for each measurement, which was added by the PDR Committee in 2012 to assist in investigations such as these. In the case of problem reports and field returns, the aggregate denominator is the installed base.

If an organization divides its own denominator into the aggregate denominator, the quotient should be similar to the organization's market share. Likewise, dividing the aggregate Field Return denominator into the Problem Report denominator will yield a FRU/NU measurement. In many product categories, FRU/NU corresponds to cards/chassis. If an organization's cards/chassis value is far off the industry value, at least one company is likely in the wrong product category.
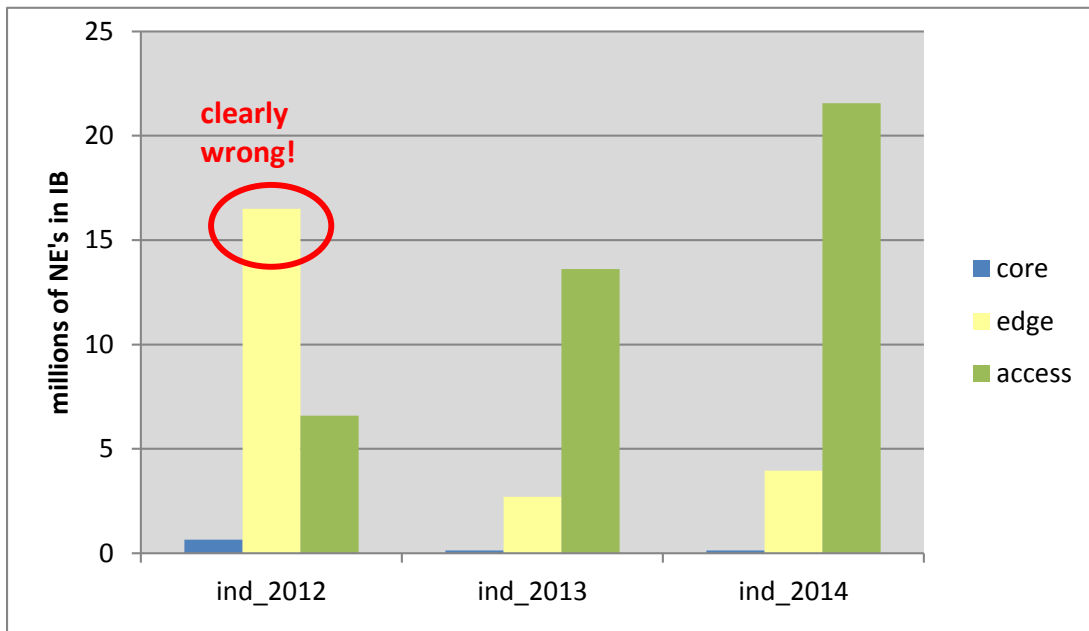


Figure 1 Annual Report for Routers

Quest Forum published the first annual PDR report with aggregate denominators for calendar year 2012. Figure 1 shows that the router product categories (1.2.9.1, 1.2.9.2, 1.2.9.3) soon aroused suspicion. The installed based showed that there were seventeen million edge routers and only seven

million access routers in the aggregate installed base (highlighted in Figure 1). With three billion connected people in the world, a population of 17 million edge routers suggested that each edge router only served an average of 175 people. Furthermore, given their position in the network, there would likely have been more access routers than edge routers, but the data showed just the opposite.
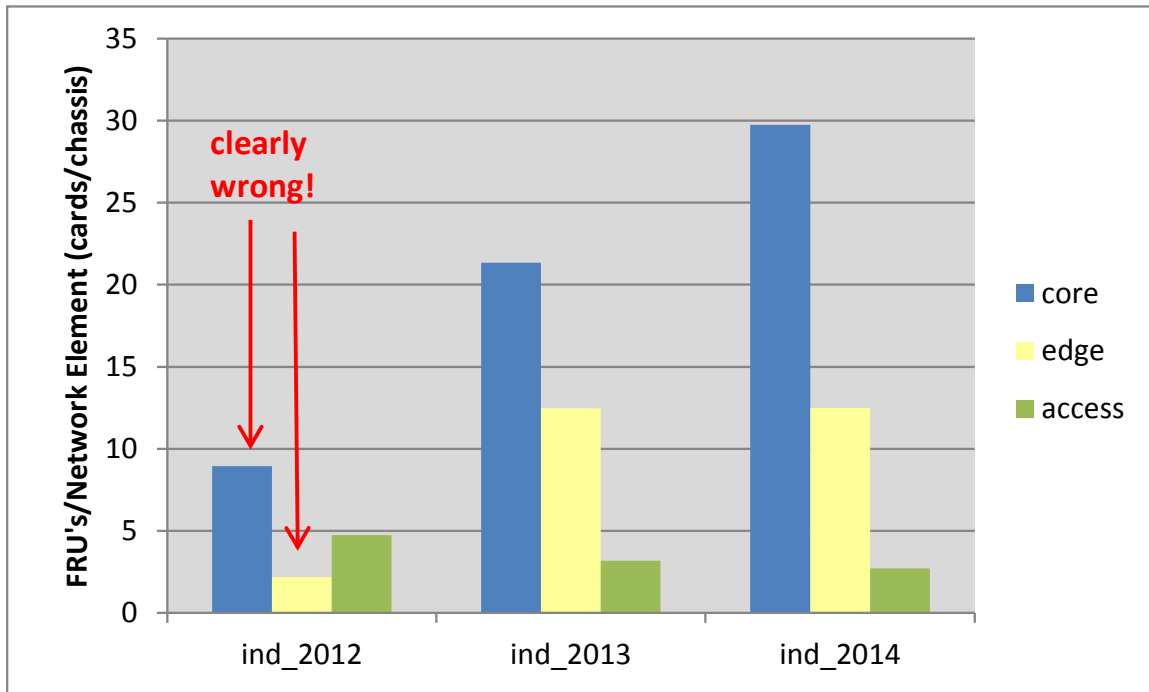


Figure 2 Comparison of Annual Report for Routers

Also arousing suspicion was the cards per chassis counts for core, edge and access routers. Core routers are large systems that frequently have more than 20 cards, but the 2012 annual report only showed an average of about 8 cards per chassis (Figure 2). Even more puzzling was the average edge router cards per chassis counts of about 3 cards per chassis.

Still another source of suspicion was some of the measurements themselves. In 2012, Critical Software Problem Reports (SPR1) were no more frequent on core routers than they were on access routers (Figures 3). Likewise, Major (SPR2) and Minor (SPR3) Software Problem Reports were only slightly more frequent on core routers than they were on access routers (Figures 4 and 5). Given the large disparity in product complexity, most users would have expected more frequent problem reports on core routers.
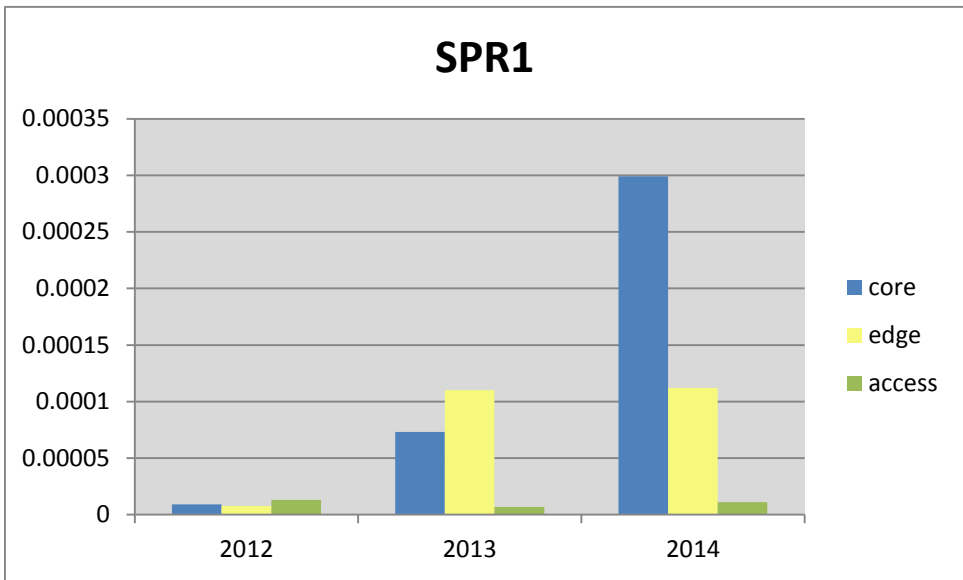
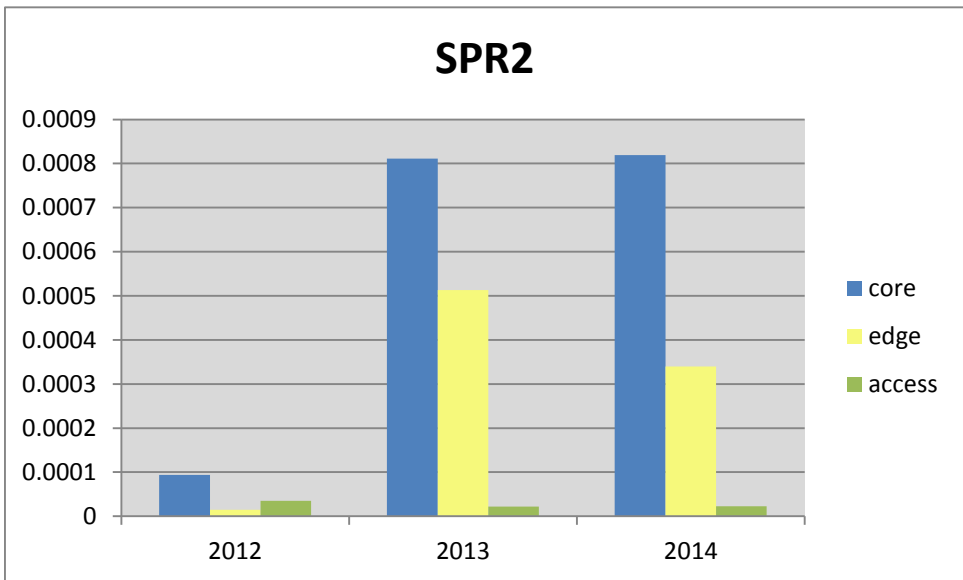Figure 3  SPR1:  Critical Software Problem Reports



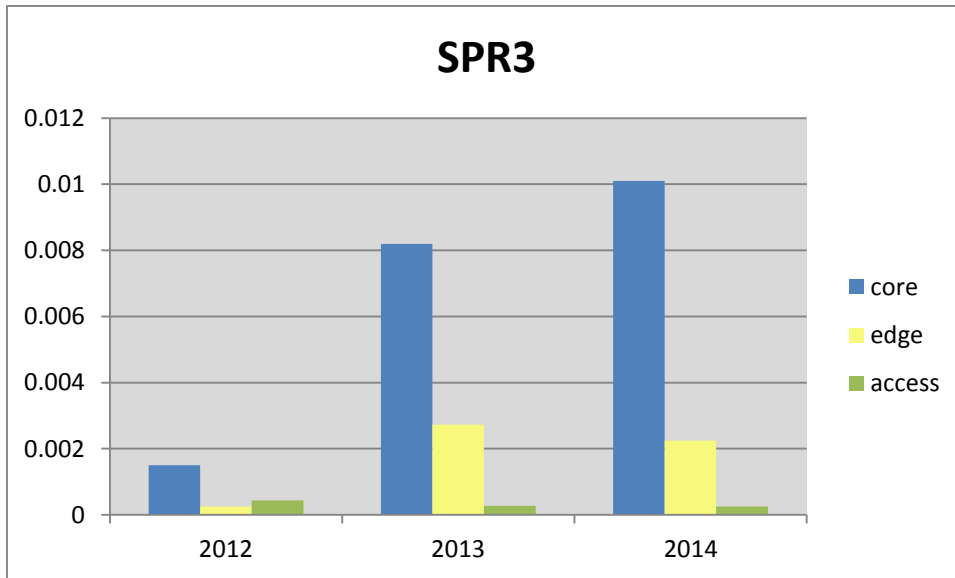Figure 4 SPR2: Major Software Problem Reports

Figure 5 SPR3: Minor Software Problem Reports

Note that in Figures 3-5, it appears that core router and edge router Software Problem Reports became worse year to year; however, the phenomenon is actually the data becoming more correct as participating companies migrate to the correct product category.

**Actions**

Based on the above peculiarities in the data, the PDR committee theorized that one or more companies might be reporting data into the wrong product category. The committee examined the websites of each company reporting router data into Quest Forum. Most of these companies had products that clearly fit into the appropriate product categories, but a few did not. If it was not obvious from their company website that a company had a product in each of the product categories in which it was reporting data, that company received a letter from the PDR Team inquiring as to which of its products did fit into each category using issue 5.1 of the Product Category table.

This analysis of the investigation resulted in a need for the Product Category Team to clarify the definitions for the core, edge, access router product categories. To improve these three router categories, the definition and examples were modified for each of the three router categories. For example, the Ethernet Switch was provided as an example for the Edge

Router category to provide further clarification.  These changes to the three router categories were made in the Product Category Table 5.2.

**Results**

The PDR Committee's 2012 decision to include aggregate denominators helped to solve this problem.   Based on the PDR Committee's inquiries and follow up, several companies changed product categories (from core/edge to access or to outside 1.2.9 altogether). After that, the global installed base and cards/chassis were now more believable. As erroneously placed products are moved out of the core and edge router categories and into the access router category, the core and edge router SPR values increase while the access router SPR values remained almost unchanged. The core and edge router SPR data (once corrected) is now much higher than is the access router data (as expected).

**Summary**

The QuEST Forum's PDR Strategic Initiative continues to take action to improve the accuracy and completeness of TL 9000 PDRs.  This paper highlighted once such initiative that impacted the important router categories. But there are other initiatives including increased data entry error checking, "advisors" requesting organizations to check suspicious data upon submission, and also targeted data "anomaly" investigations. These investigations request all companies in a specific product category to check their numbers for specific measurements.  These have also resulted in data resubmissions that removed the "anomalies" and provided more realistic benchmark information.

Starting in 2015, in order to ensure products are placed in the right category from the start,   Quest Forum now has a committee that verifies that new registrations are being submitted into the correct product category.   This should prevent newly registered companies, or companies with scope expansions, from submitting data into the wrong product category.

You too can help!  If your product category's data appears incorrect, it may very well be incorrect. With some effort, corrections can be made to make it useable. Reporting questionable data issues through the Contact Us at QuestForum.org will be directed to the PDR team, and they will make every effort to investigate your concern help the data to continue to be meaningful.