



Optimizing a voice network demands the right data, the right metrics and the right methodology. And, balancing the budget constraints while striving to provide adequate service levels to assure the network is performing to expectations is the true challenge.

To be able to optimize a network, the first key step is obtaining an accurate account of the level of service the network is providing. Caller quality of experience or grade of service is based on many aspects of the network design. Let's dive into a few fundamental principles.

Route Plan Grade of Service is Key

It is critical to realize that caller experience is not simply based on the capacity of one particular trunk group but instead how calls can be serviced collectively by all available trunks as defined by call routing schemes.

The probability that a caller receives dial tone is based on all trunks and their activity in all trunk groups in a routing plan.

Historically and universally, with the exception of Traffic Analyst, grade of service is only reported for individual trunk groups. In any situation where two or more trunk groups are joined in a route plan, reporting on the individual trunk group does not accurately reflect the service level experienced by callers.

Peaks are NOT Cumulative

To illustrate that peaks are not cumulative, let's look at a specific example. Assume a simple scenario with two trunk groups – Long Distance and Local. Let's start with Traffic Analyst's Usage Profile report. In this report, each line in the graph represents an hourly value of usage, with incoming and outgoing traffic solutions@impacttech.com 314.743.1430

volumes represented by the blue and red lines, respectively. The group of five "spikes" represents the five business

thousand words; or, in this case, a 12 percent savings in capacity compared to the engineer adding the peak values



days in the week with the "valleys" between them representing weekends.

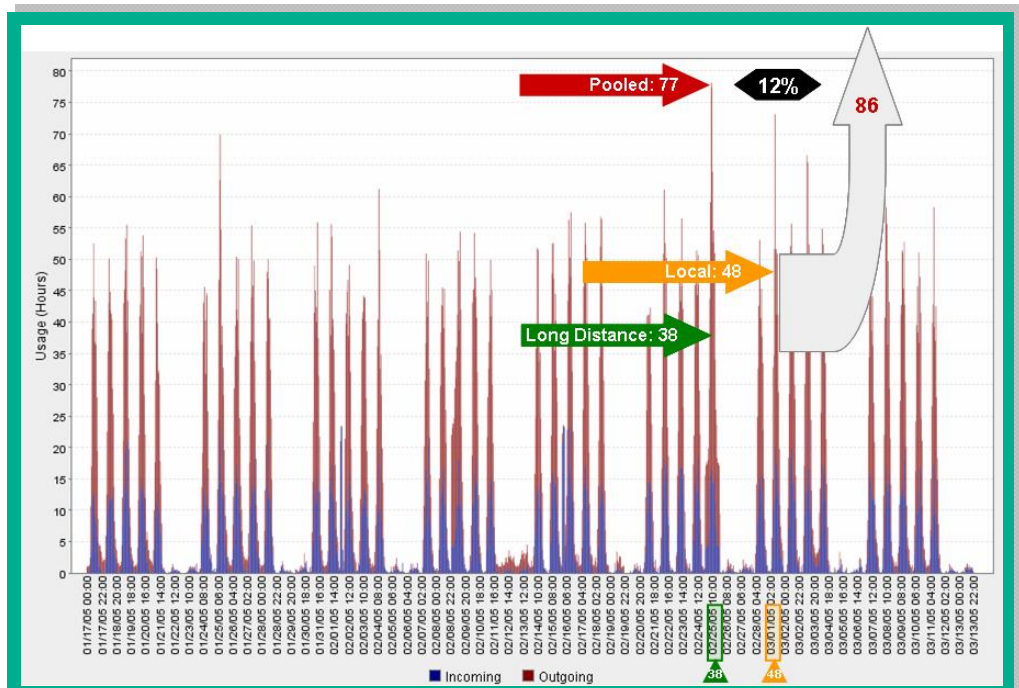
together.

From the above report, we observe that the Long Distance trunk group had its peak usage of 38 hours on February 25th. A similar report for the Local group indicated a peak of 48 hours occurred on March 1st. If you sum the peaks, you would engineer for 86 hours of usage. However, given pooled trunk groups (route plans) with "time syncing" of the usage, the actual peak is 77 hours, as shown in the second Usage Profile report below. A picture is worth a

Large Team Efficiencies

To this point we have talked about hours of usage. The next step is to convert the usage into the required network capacity based on a desired grade of service. This leads us to the final principle – large team efficiency.

Traffic Analyst allows you to set your target grade of service, such as 1% blocked calls, and to designate your preferred engineering model, such as Erlang B, Extended Erlang B, Erlang C,



Poisson or others. With this information, Traffic Analyst converts your usage data into capacity requirements. In our example, the Long Distance trunk group with 38 hours of usage translates to 50 required trunks to provide 1% blocked calls grade of service. Similarly, for the Local group, the 48 erlangs translates to 64 required trunks to provide 1% blocked calls.

This might lead one to assume that 114 trunks would be required. However, if we pool the trunks to create a larger resource pool, the same 1% blocked calls grade of service is achieved with only 93 trunks. This represents a savings of 21 trunks.

The Financial Impact

Back to the balancing act of budget and delivering high grade of service to your callers. By appropriately applying the principles above, you can be the hero in your organization by contributing a reduction in operating expenses without sacrificing performance. In other words, turn liabilities into assets.

One definition of a liability is when no value is received for a cash outlay. Liabilities consume cash, they don't produce it. At a minimum a cash investment should provide some return, some benefit, some value. The worst scenario is outlaying cash on a continual basis and never receiving some value, any value.

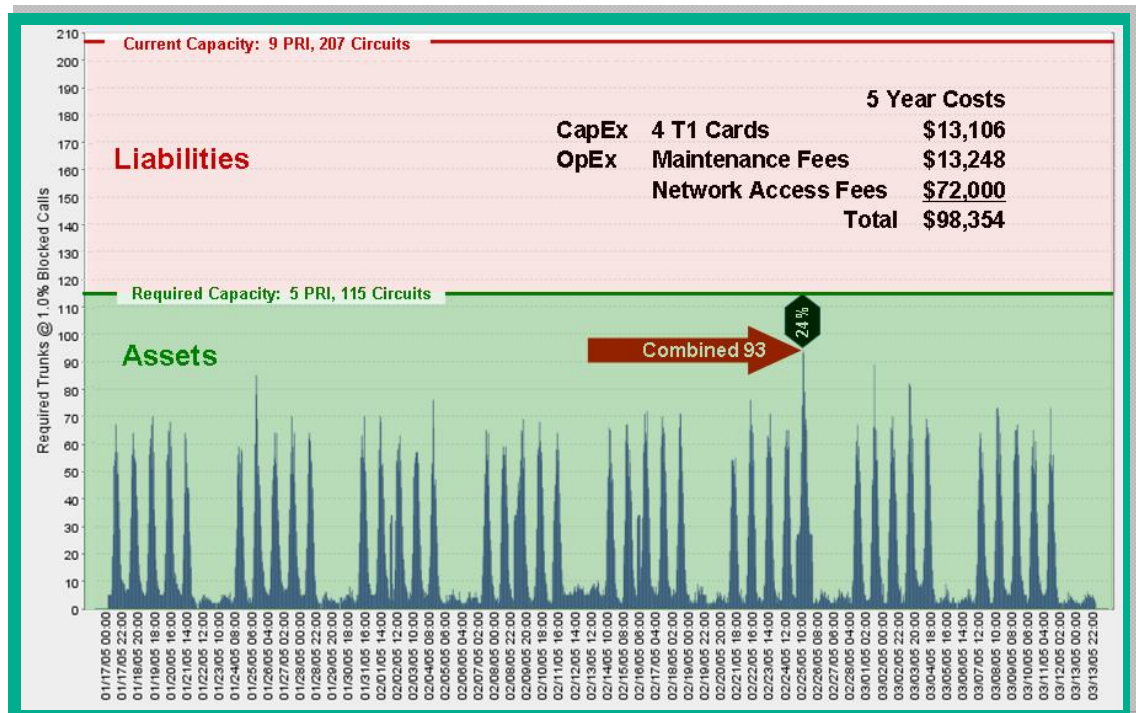
Such is the case with excess capacity in a network. Upfront you spend capital dollars (CapEx) to buy more network cards than are needed, then you have recurring operating expenses (OpEx) for

maintenance fees and network access fees.

Let's use our previous example to study this point. Over the time period studied, the most voice circuits ever required were 93. The actual capacity was nine active PRIs providing 207 circuits. Know that this is neither a hypothetical or atypical example. This is a real situation and the percentage of surplus circuits is very common. The 93 required circuits are one more than provided by 4 PRIs. So let's round up to 5 PRIs, providing 24% surplus capacity. Please refer to graphic below for visual illustration. Money spent in this area would be considered an asset as

- ♦ CapEx cost for the purchase of four T1 cards is \$13,106
- ♦ OpEx cost for ongoing maintenance (assuming \$3/port/month) is \$13,248 for four years of support
- ♦ OpEx cost for five years of network access fees (assuming \$300/T1/month) is \$72,000.
- ♦ Total five year cost (liability) of \$98,354.

If your company has a cost reduction initiative, this may be an opportunity for you to shine by applying these principles to your network engineering. Surely if you are purchasing a new switch, re-configuring your network or entering negotiation with your service



the circuits will definitely be used or there is some level of insurance value provided by the 24% surplus.

Money spent above this level is considered a liability as there is no reasonable expectation that any additional capacity would ever be used nor any value ever derived. If we quantify the liability in terms of five year costs, the numbers approximate to:

provider, you want to make sure you have your voice circuit and card requirements well understood. To not do so would mean you're risking spending money where no value would be received instead of re-directing to purchasing other solutions that will provide real value. The point is this, companies and people that deliver more value for the same dollar expenditures thrive; those that don't struggle. Here is a clear opportunity to enhance your value and success.