

## Evaluating your Internet Infrastructure

TODAY IT IS NO LONGER JUST A MATTER OF HAVING AN INTERNET PRESENCE

THAT PRESENCE MUST BE HIGHLY AVAILABLE AND RESPONSIVE FOR YOUR TARGET MARKET

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Evaluating your Internet infrastructure has a lot in common with the strategic planning and evaluation of most things. After the techno-speak and business-speak are stripped away, it really comes down to two basic concepts:

What you have and what you need.

### WHAT DO I HAVE?

For the moment, put the issue of need aside. The first thing you want to look at are the resources you currently have.

Take a look at the way your network as it is right now. You need to ask yourself the following set of questions. Don't worry if you don't know all of the answers off the top of your head, but it is important to find them.

First, what public servers do you have on your network? Is it just a web or mail server or do you have half a dozen production boxes, a mail server, and the Robosapien that you got for Christmas? How many of them need to be at your physical location? (hint – the Robosapien probably isn't one of them.)

Which of the services that you have are business critical? If there is any doubt as to whether a service is business critical or not, think of what would happen if it suddenly went down. If the answer is that you and your employees would not be able to work, would be unable to make money, or would lose a great deal, then it is a business critical service.

Where, physically, are your servers? Are they in Chicago, somewhere on the east coast, California, or somewhere else?

Where are the majority of your customers? Are they in the eastern United States or in central Germany?

If you have multiple large concentrations of customers, list all of them. The important thing for this point is to have a list of where the bulk of your traffic comes from.

How much traffic do you have? Do you experience consistent traffic or does it come in spikes

with mild to moderate traffic at all other times? If you experience major traffic spikes, do they follow any certain pattern? Do they only happen for a few hours once a month or do they last for days?

Next, how much bandwidth do you pay for? Are you paying for a T1, fractional T1, business class DSL, or some other form of connection? If it's a T1 or T3, remember that there are usually two charges – one for the carrier (who supplies the physical line – generally the phone company) and one for the ISP (who provides your Internet connection).

How much downtime do you experience in a typical month? Is it just a few hours or can it be measured in days? Do you have a service level agreement (SLA) with your provider? If so, is it satisfactory for your needs?

How many physical connections to the outside world does your network have? Is there just one point of entry for your network, or are there multiple ones?

### HOW DO I USE MY RESOURCES?

I know I said that it boils down to resources and needs (which it does), but before you can answer the question of what you need, you have to think about how you use the things that you already have.

What are you using your public servers for and how much of your bandwidth do they use? Are they mail or VoIP servers (which make sense to have on site) or are they production boxes which can generally be pretty much anywhere? If they are production boxes and they are using a lot of bandwidth, you might want to see if it makes sense to move them to a co-location site.

How much bandwidth do you use? You already looked at how much of your bandwidth your production boxes take up. Now it's time to look at the network as a whole (both incoming and outbound traffic). Also consider the amount of bandwidth you would be using if your production boxes were co-located somewhere else.

Are you paying bandwidth or transfer overage

charges? Some service providers offer connections that normally function at one speed but are burstable to a higher speed (sometimes charging a fee if you exceed the normal speed for a certain period of time). Likewise, some providers meter the amount of data that you can transfer per billing period and charge you extra for the amount that you exceed that limit by.

Are the services that you identified as business critical redundant? If the server you have it hosted on exploded, would you still be able to do work? Believe it or not, this is something which I have seen in the past. It was impressive and awe inspiring but it was also not the best way to start a day at work (especially since it was the middle of February and we had to open the windows in order to vent the resulting smoke).

You've answered the questions of where your servers are and where your customers are. Do these two answers compliment each other? If most of your customers are in the western portion of the United States and your server is in California, then the answer is yes. If most of your customers are in New York and your servers are in Germany, that's something you might want to change. Lastly, do you have heavy concentrations of customers in countries other than the one your home office is in?

## WHAT DO I NEED?

Now that you've made a list of what you have and how you use it, you can start to look at how things need to be changed.

Are you paying for a lot of bandwidth that you aren't using or paying overage charges? This question is a little tricky because the objective is to have more bandwidth than you need, but not too much more. Having too much bandwidth is a bad thing, but not having enough is even worse.

First, consider the amount of bandwidth that your production servers (or any other server that it might make sense to co-locate) are using. If you have multiple T1s just to supply bandwidth to your production boxes and they don't necessarily have to be on site while the bulk of your remaining traffic is simple email or browsing, it might make more financial sense to have them hosted elsewhere and downgrade the service in your office to business DSL.

On the other hand, if you have a fractional T1 and actually use the bandwidth, it might make more sense

to upgrade to a T1 because pricing for a full T1 is generally cheaper due to extra work required by the phone company for fractional T1.

If you have any questions as to whether you are getting a good price for your T1 or T3 line, [www.bandwidth.com](http://www.bandwidth.com) is a good place to check for price quotes. It should also be noted that installation fees might be waived and your fees lowered if you sign a long term service contract (much like the pricing difference between a regular cell phone plan and with a two year contract).

One thing to keep in mind if you want to change the type of connection you have is the SLA. T3 and T1 generally have very good SLAs while the SLA for business class cable tends to be much poorer and not really suited for running production servers. DSL tends to be somewhere in between cable and T1 in terms of SLA but access for business DSL is often bandwidth or distance limited.

Now that you know where your customers are and where your servers are, do you need servers in other locations to cater to them? If so, you might want to look at the web tech section in this issue.

If you have heavy concentrations of customers in foreign countries, it would also make sense to have country specific (i.e. .co.uk) domains for those countries. This will allow you to have language specific sites as well as save both you and your customers from trying to figure out how to deal with currency differences, tax, shipping, etc.

In the last section, you looked at whether or not your business critical services were redundant. If the answer is no, you have a few options.

- Simply add another server where you are that will run backup versions of those services in the event that the main server goes down. This is often the cheapest option. However, if something were to happen to your building (fire, flood, earthquake, etc), your business critical services would still go down.
- Open a remote office with redundant servers and staff. While this option works really well (providing you have a competent staff), it tends to be much more expensive than most companies are able (or willing) to deal with.

- Pay to have redundant servers co-located. While more expensive than simply adding another server to your rack, it is markedly less expensive than opening a whole new office. This option is discussed in more depth in the web technologies section of this issue.

If there is only one physical access point from your network to the outside world, you might want to consider adding a second one. The reason for this is that these links occasionally fail for various reasons. The most infamous of these is often referred to as the Backhoe of Doom which is when someone digging a trench doesn't make absolutely certain that there is nothing important buried where they want to dig before they bring in the earth moving equipment. If this happens to you and that link to the outside world is a single point of failure, you're going to be stuck playing solitaire and emailing to the other people in your building because you certainly won't be able to do much else.

Above all, you should remember to leave yourself room to grow as far as network requirements are concerned. If you've locked yourself into a certain plan for an extended period of time in order to get a good rate and your needs suddenly increase, you may find yourself stuck with either overage charges or a network which can not handle the amount of data being demanded of it if you stay with that provider or cancellation fees if you need to go with a different provider because your current one no longer fits your needs (it is rare for a provider to charge you for breaking a contract if you go for a larger contract with that provider) unless you can use co-location and load balancing to move enough traffic through a network other than the one at your location.

#### WHAT ELSE COULD I USE?

Covering what you need is vital. However, there are things which, while not necessary to your network and Internet infrastructure, can help improve it.

Among these possible non-vital improvements, if you decide to keep your production servers at your location, and want the connection they have to the outside world to be solid while it is alright for the rest of your traffic (such as email and browsing) to go down on rare occasions, you might want to consider keeping your production servers on a T1 and the rest of your traffic on business class DSL. To do this, you

can use QoS (Quality of Service), which is now available in the Linux kernel, to route outbound traffic from your production servers over the T1 while routing all non-essential traffic over your DSL connection.

Your infrastructure isn't something that should only be evaluated once and then forgotten. Like the rest of your business, it may have to change over time. You should re-evaluate it periodically to see if you need to expand or shrink. It's all a matter of knowing what you have, what you need, and how to balance the risks and rewards of how you deal with your resources.

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