CenturyLink Targets Six Nines
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The U.S. telco giant CenturyLink is aiming to offer its customers six nines of reliability in its SLAs (Service Level Agreements).[1] This is an extraordinary level of reliability. It means that, on the average, its service will be down for only thirty seconds per year.
Of course, this doesn't imply that it may be down thirty seconds every year. It might be down five minutes every ten years. Nevertheless, it is an availability that is difficult to achieve.

CenturyLink has yet to issue its SLA guaranteeing six 9s of availability. It will be interesting to see how strongly it stands by this commitment. SLAs have a tendency to make big guarantees with minor penalties.

For instance, an Amazon SLA for its S3 (Simple Storage Service) data storage service guarantees a 99.9% uptime.[2] If the service does not achieve 99.9% uptime but does achieve at least 99% uptime (88 hours of downtime in a year), then 10% of the monthly fee charged to the customer would be applied against the next month's charges. This adjustment would apply if S3 was down for more than 45 minutes per month, and it covers downtime up to seven and a half hours per month.

For a typical customer, this might amount to a few hundred dollars a month in compensation for hours of lost business. Of course, for Amazon, it could amount to millions of dollars spread over its very large customer base.

CenturyLink plans to improve its availability to this level as it rolls out new data centers. However, the company has a long way to go to achieve its goals. For instance, its CenturyLink Cloud includes a network infrastructure availability SLA of just four 9s.[3]

Furthermore, especially at high levels of availability, it is important to define what is 'downtime:'

- It the user has access to some applications but not to all of them, is he down? Do you apply a fractional downtime to him (the user is 30% down)?

- If some users have access to all applications but others do not, how is that downtime measured?

- If some fault forces users to reconnect, are they down during their reconnection time?

- If users can reach an application via land lines but not mobile services, or vice versa, is the application down?

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[1] CenturyLink Targets 'Six Nines' Reliability, *Light Reading*; May 31, 2016.
[2] How Many 9s in Amazon?, *Availability Digest*; June 2008.
   http://www.availabilitydigest.com/public_articles/0307/amazon.pdf
[3] The Low Down on High Availability in the Cloud, *CenturyLink Cloud Whitepaper* 2016.

Somehow, the calculation of an average downtime per user or the average downtime per application must be specified in the SLA.

The achievement of very high levels of availability such as five 9s or six 9s requires extremely rapid recovery time. The system supporting the application must be architected to recover in seconds. Taking minutes to switchover to a backup system simply will not provide these levels of availability.

One example of extraordinarily high availability is your telephone's dial tone. When was the last time you picked up your handset and did not hear a dial tone? In my case, the last time was years ago. A dial tone is expected 100% of the time, and its availability is very near that.

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