

## 6.6: Security vs. Availability

Much of the business networks will still be up and running. Security staff recognizes that network stability must be maintained for the company to achieve its goals.

Any company or industry has a small tolerance for downtime on networks. Usually, this tolerance is based on calculating downtime costs with the cost of insuring against downtime.

For example, using a router as a single point of failure could be tolerable in a small retail business with only one location. However, if a large portion of that company's sales is from online shoppers, the owner may want to have a redundancy degree to ensure there is always a connection.

Desired uptime is also expressed in the number of down-minutes in a year. For example, an uptime of "five nines" means the network is up by 99.999 percent of the time or down by no more than 5.256 minutes a year. "Four nines" would be a 52.56-minute downtime per capita.

However, security cannot be so powerful that it interferes with employee needs or business functions. This is often a tradeoff between good security and allowing companies to work efficiently.

Availability %	Downtime
99.8%	17.52 hours
99.9% ("three nines")	8.76 hours
99.99% ("four nines")	52.56 minutes
99.999% ("five nines")	5.256 minutes
99.9999% ("six nines")	31.5 seconds
99.99999% ("seven nines")	3.15 seconds

### ? Fun Fact - Three nines 6.6.1

Why 99.9% uptime is called 'three nines'? And downtime is 5.256 minutes?

#### Answer

99.9% uptime = "three nines". This means the network is available 99.9% of the time.

To calculate the total allowable downtime:

1 year = 365 days x 24 hours x 60 minutes = 525,600 minutes

0.1% downtime = 525,600 minutes x 0.001 = 525.6 minutes

So "three nines" allows a downtime of 525.6 minutes per year.

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