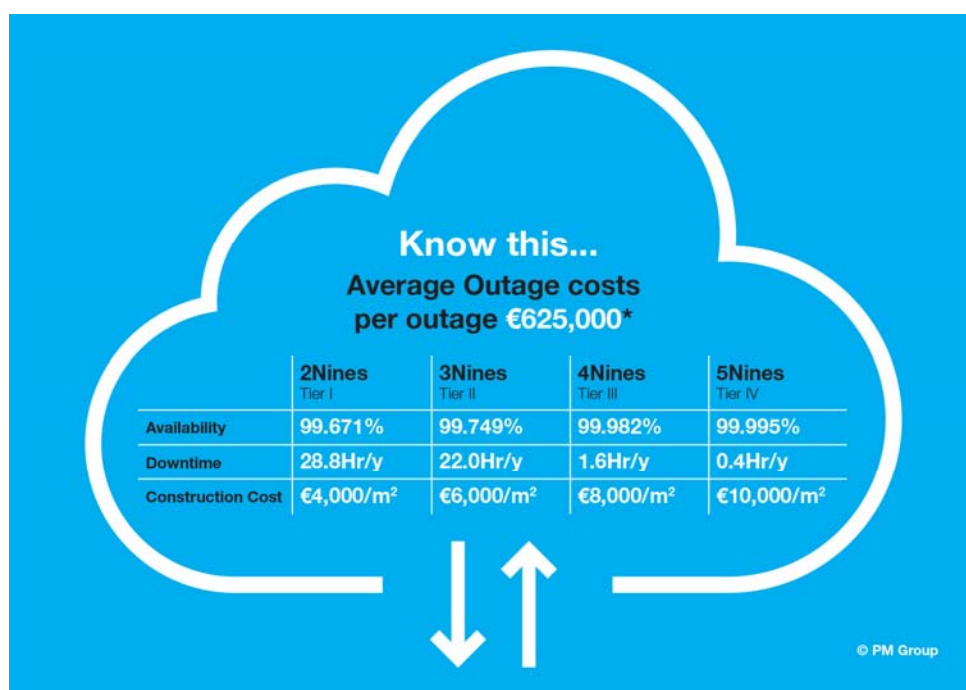


# Rule N°1 - Never lose your data

## Rule N°2 - Don't forget Rule N°1

When trying to understand Reliability & Availability, Warren Buffet's classic rules also hold true for the Data Centre Industry.

Gambling with your critical data can have serious consequences especially with an **average industry outage costs** in the region of €625,000 per loss of service. That equates to a cost increase of 38% over the last five years. New data cloud customers particularly need strike a balance between **the optimal CAPEX balancing point between reliability costs and availability cost.**



Source: **Uptime Institute**, the price of data centres and Anixter white paper

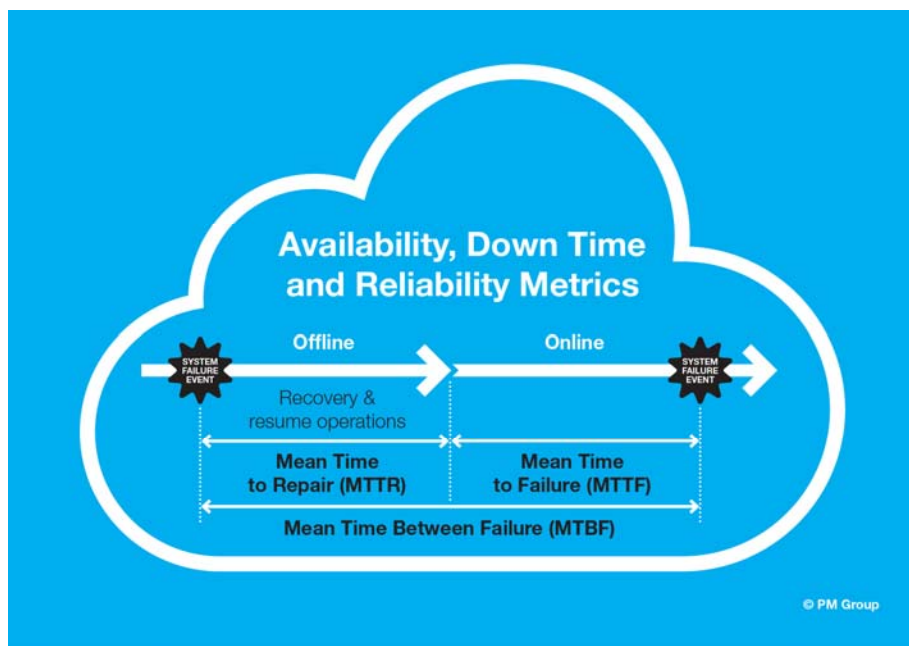
The table above describes the **traditional levels under the “Nines” and “Uptime Tier@” classifications.** You can see even with scheduled maintenance how long the expected downtime is for each classification. **With increased availability there is a direct CAPEX impact;** eg a 5 Nines/TierIV Data Centre(Data Cloud Storage facility) costs approximately 2 times that of a 2 Nines/Tier Data Centre.

By understanding these metrics, you can ensure a **high level appreciation of risks, outages and how to positively mitigate them.** No matter if you are an experienced data centre operator or a new data cloud customer, it will help you to **identify where to focus your investment for optimum return.** Doing so will also ensure a much higher level of data availability from your data centre provider or data cloud storage facility.

Rule N°1 - Never lose your data ; Rule N°2 - Don't forget Rule N°1

**Reliability and Availability of Data Cloud** are generally measured using three metrics:

1. Availability metrics measured in 'Nines' or "99.999" - or the equivalent to 5 Nines
2. Tier@ (Uptime Institute) Industry standard for third party accreditation
3. Mean Time to Failure (MTTF)



Other key metrics widely used in the Industry for Reliability & Availability are the MTTF, MTTR and MTBF.

- Mean Time to Failure (**MTTF**) **Availability**
- Mean Time to Repair (**MTTR**), **Down time**
- Mean Time Between Failure (**MTBF**) **Reliability**

Failures or **unplanned outages** have a number of serious consequences including:

- Business Disruption
- Loss of Revenue
- Reduction of End User Productivity
- Duration for Detection and Recovery
- Equipment Replacement, CAPEX & duration for replacement, to name a few

During the design phase, data centre designers identify typical potential failures and provide redundancy paths to ensure the same high level of service in the event of a failure. Programmes like "**Monte Carlo Analysis**" are widely used in the Data Centre Industry to identify the availability of the systems in terms of 3, 4 and 5 Nines availability.

While these direct business impacts, there are a number of indirect impacts which may not be immediately measurable including **brand damage/customer credibility** and third party impacts.

Rule N°1 - Never lose your data ; Rule N°2 - Don't forget Rule N°1

## The Importance of key Metrics

Customers of data cloud providers / data centres should be familiar with these **metrics**, as every piece of critical equipment in a data centre (e.g. UPS, Chillers, Switchgear etc.) is highly likely to fail at some point over the course of its lifetime.

Whilst every effort should be taken to align a high level of availability with associated CAPEX, the practicalities of **the unforeseen must be expected** – ‘planned/unplanned’ outages are similar to the ‘Known unknowns’ oxymoron. Historically, **unplanned data centre outages** are typically caused by the following:

Typical causes of unplanned data centre outages	
UPS Systems Failure	25%
Cyber Crime (DDoS)	22%
Human Error	22%
Water, Heat or Cooling	11%
Weather Related	10%
Generator	6%
IT Equipment Failure	4%

Source: *Cost of Data Center Outages Jan 16, DCPB Series, Ponemon Institute*

**Who monitors the Data Cloud Providers?** Today, **data cloud providers are policed** by companies like *CloudHarmony* and others are confirming Data centre providers actual availability, for example:

Data Cloud Providers	Availability (MTTR)
Amazon EC2 SA-East 1	99.9969% (1.34 minutes)
Microsoft Azure Virtual Machine US-North Central	99.7745% (1.49 hours)
Oracle Cloud Compute US-Ashburn-1	99.979% (12.15 mins)
Vultr, Tokyo	99.5421% (3.3 hrs)

Source: **CloudHarmony** - sample figures from a 30 day period - November 2017

Some **Legacy Data Centres** all too often rely on equipment that may be out of warranty and fail to achieve the ongoing financial investment level required to maintain their level of Data Cloud Availability. They may have originally had a high level of availability which has diminished over time e.g.

- UPS Systems and their limited battery life span of 4-6 years
- Operational and maintenance procedures not being in line with current best practices.

In the last 12 months headlines of **significant unplanned outages** serve to highlight **the risks** in not having a clear availability and reliability strategy.

**Whether we like it or not, outages are a reality of data centre and data cloud storage facilities. Understanding the key risks and metrics behind outages will allow operators and customers the ability to make critical decisions that will positively impact their business.**

***About the author:-***

**Lorcán Mooney** is a Engineering Lead and construction consultant with over 20 years experience. He is currently involved in Data centre research, design, engineering and consultation. He is a key consultant with PM Group working on data centre projects from site selections, design and construction across multiple time-zones and cultures.