When transferring your business to the cloud, you have to choose an IaaS provider. This means evaluating availability, scalability and more. However, the performance of any virtual environment depends on the hardware installed in the data centre. In most cases, this infrastructure (and its location) is the main factor determining cloud service reliability.

Today we discuss how to evaluate the DC parameters of IaaS providers.

## Reliability and Redundancy Level



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First, when evaluating the data centre, you should pay attention to the reserve of the engineering infrastructure, especially the power supply system - as this parameter affects the availability level, i.e. continuous operation without failure.

**To evaluate the level of backup, you can use the Uptime Institute rating scale.**

- Tier 1 - In this case, there is no backup scheme (N). Reliability depends on each individual element of the infrastructure and failures in one unit of equipment cause downtime throughout the data centre.
- Tier 2 - refers to the N + 1 backup scheme. An additional element is added to the elements of the N infrastructure, reducing the risk of failure.
- Tier 3 - This backup scheme is also N + 1, but there is the possibility of working parallel technology.
- Tier 4 - 2N backup, when each item repeats the same.

The classification layer assumes that the engineering system is treated as a single entity. If at least one component is not retained, the UI fault tolerance level will be reduced. The higher the layer, the greater



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the usability.

- **Note: there is no "better or worse" UI classification. To select a DC with a certain level of retention you must start with your business tasks.**

If your organisation is a large one and any shutdown seems to be a disaster, you should focus on centres with 2N backup. Let’s take Facebook as an example. The company's data centre is located in Sweden and has 2N backup.

However, in some cases, this system may be excessive. The higher the level, the more expensive the cloud provider's equipment is. Therefore, it’s worth choosing a smaller number of centres if one hour of downtime once a year is less than critical for your company.

## Microclimate Maintenance



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The next important aspect is to evaluate the data centre's "cooling unit". The ability of a cooling system to maintain the optimal microclimate influences the "iron" reliability in the engine room, the price of electricity consumption and therefore the overall cost of the services provided.

*For example, when the temperature inside increases from 22°C to 35°C, server power consumption increases by an average of 20%. According to a representative of the engineering association ASHRAE , responsible for communication standards development and air quality estimation, temperatures below 18°C and above 27°C can significantly reduce the battery output and lifespan (reported on page 29).*

You also need to accurately consider how to maintain the required temperature within the data centre. If the cooling system is inefficient, it will consume a lot of energy. In some cases, up to 40% of total power consumption is used for air conditioning. This, in turn, can affect equipment rental costs.

- "Free cooling" technology is often used to control the microclimate and air temperature in the DC, reducing overall power consumption. The record holder in this area is Google's data centre - the IT giant has successfully achieved a PUE of 1.11.

You should also consider the level of humidity inside the centre. The formation of condensed water can be hazardous to the server equipment and lead to deterioration. This already happened with Facebook - at their first data centre in Prainville, errors in the functioning of the microclimate system caused liquids to enter the hardwear. There was literally "condensed rain" falling on the server. In this scenario the hardware must be disconnected urgently. ASHRAE claims that the interior moisture level should not exceed 60%. In the case of Facebook, that number reached 95%.

## Physical Security



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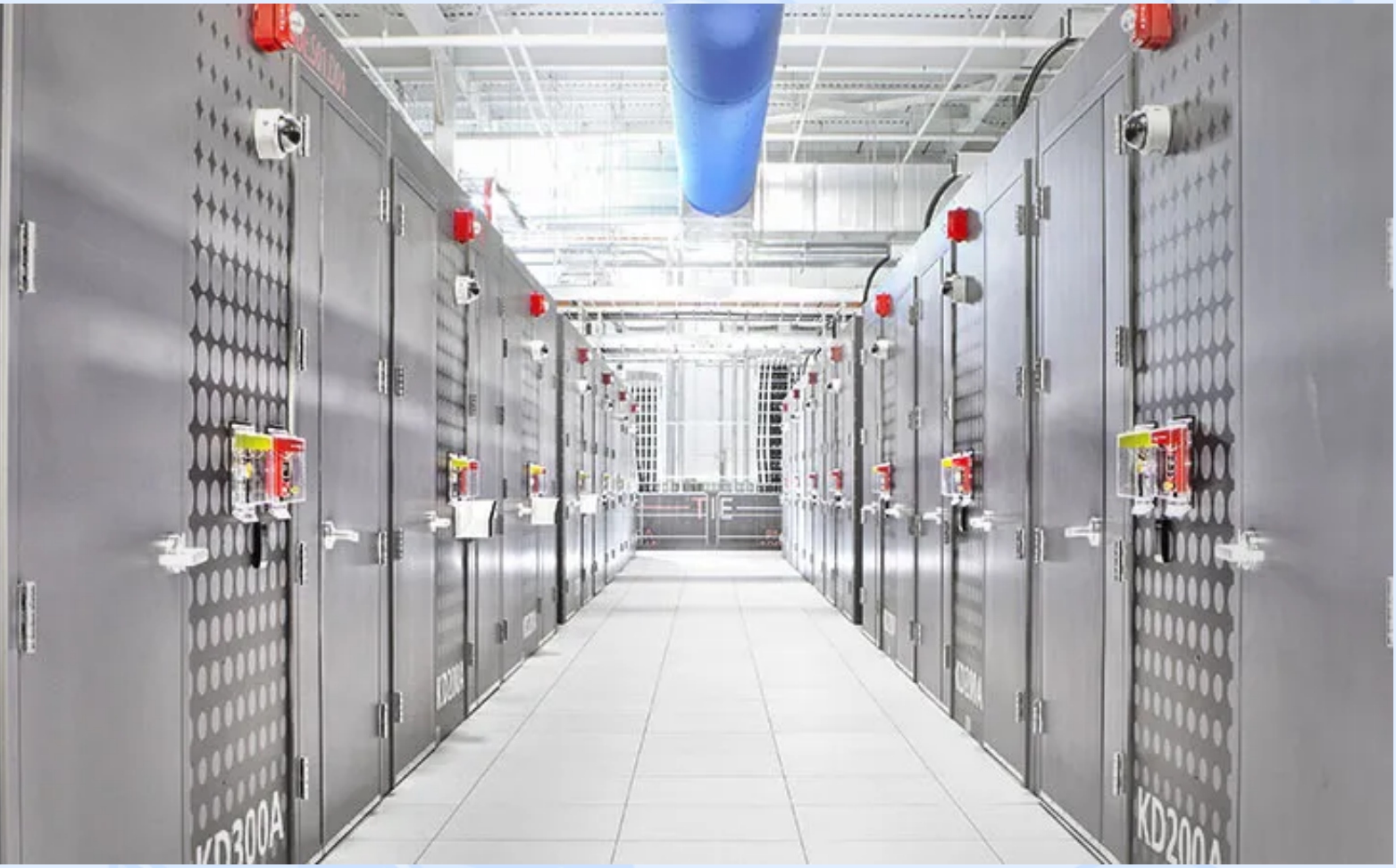

Today, the data centre can be housed in an underground bunker whose entrance is guarded by armed soldiers. There are data centres that can survive nuclear explosions or EMR. In most cases these are used by larger multinational companies or military structures. For most organisations, such measures are superfluous and economically unprofitable. However, the issue of security and physical penetration still applies to everyone.

**There are three points to consider:**

- Staffed checkpoint;
- Cameras and alarm sensors along the perimeter;
- Security of the server rack units.

The best way to check each point is to access the data centre. When verifying the physical security of the computer room, it is necessary to evaluate not only the perimeter and server security, but also the fire safety level of the facility.

## Let's Summarise



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When evaluating the reliability of a cloud provider data centre, you should do the following:

- Pay attention to the engineering infrastructure backup. The level of availability depends on this. Select the backup plan you need based on your business requirements and tasks.
- Evaluate the system for cooling and maintaining the microclimate in the computer room. Ideally, data centres should use technology designed to reduce PUE. This way they can spend more on computing than cooling servers, which saves money for customers.
- Within the data centre, the physical protection (security, fire suppression systems, video surveillance) of the server room should be organised and strict entry procedures for incoming visitors established.

However, the security and reliability of the data centre depend not only on physical security measures but also on software: firewalls, data encryption, DDoS protection mechanisms, etc. And if, now that you know how to choose the right data centre, you need special software to protect your data, just contact us to discuss your business journey to the cloud.



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