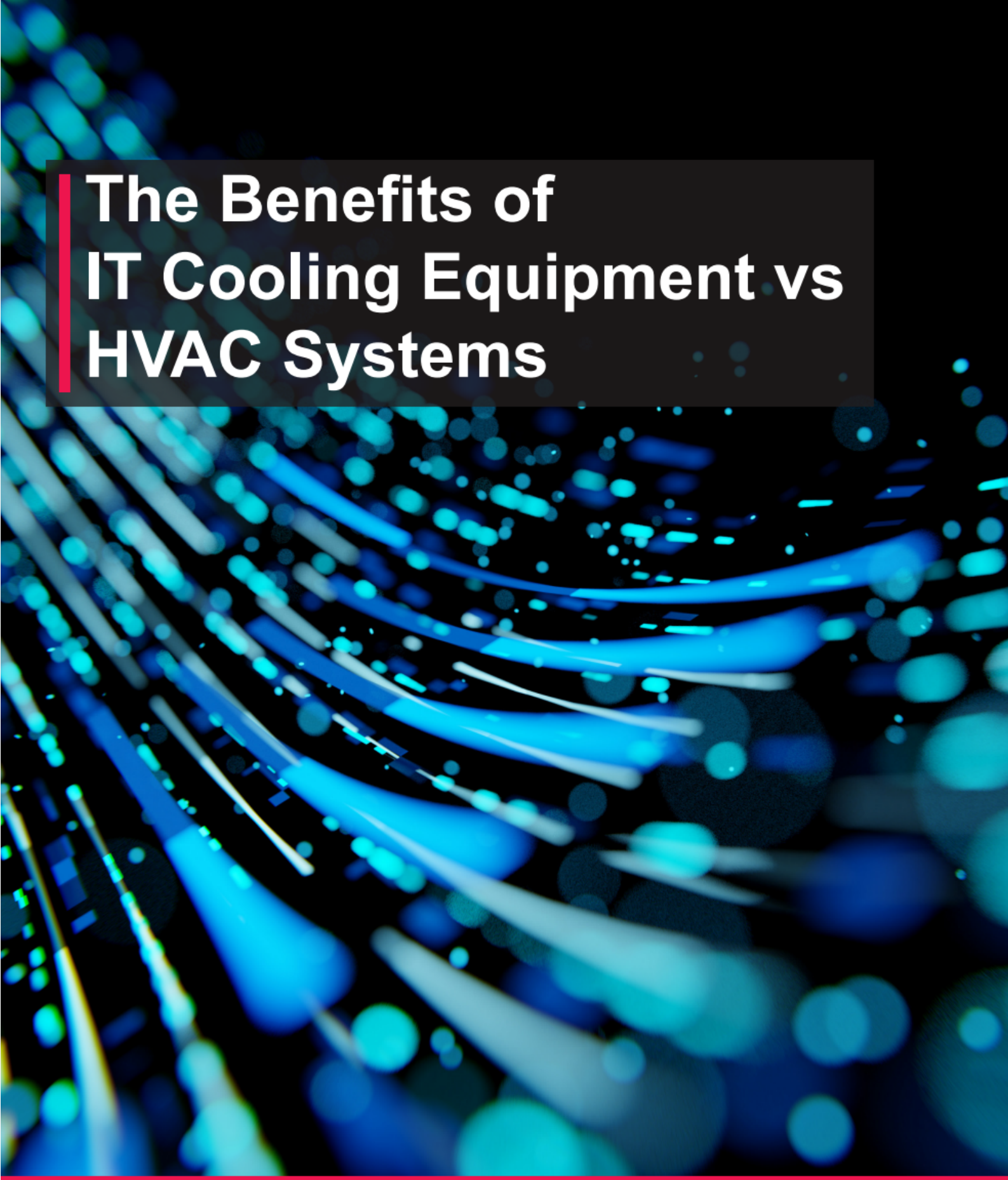
The Benefits of IT Cooling Equipment vs HVAC Systems



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INTRODUCTION

The summers of recent years will surely be remembered for the searing, record-breaking heat experienced across much of southern Europe, the Mediterranean, parts of Asia, and north Africa.

The cause of these very high temperatures has been widely attributed to an untimely alliance of El Nino and human-activated climate change.

Extreme heat will stress-test all IT equipment, causing componentry that is designed to work within strict temperature parameters to slow and then stop, along with the services that depend upon it. One of the most recent, high-profile, examples was the 24-hour outage at cloud giant Alibaba in December 2022, which was caused by a faulty cooling system. Even though it was down for just a day, it's estimated that customers' losses reached hundreds of millions, if not billions, of dollars.

Introduction

As things stand, the number of total system failures in specialist data centre facilities that have been caused by the rise in global temperatures are probably still some way below failures caused by power outages, thanks largely to built-in cooling redundancies and efficient maintenance regimes. However, there is concern that excessive summer heat may soon start to exceed data centre design specifications, certainly in older facilities, which could potentially lead to system failures on a scale that has never been seen before.

But the bigger immediate worry is the number of smaller operations that still depend on heating, ventilating and air conditioning (HVAC) systems to cool their IT systems; these are likely to be running on borrowed time.

HVAC systems are designed to cool (and heat) homes and businesses, creating comfortable spaces for humans to live and work in. But HVAC systems are entirely unsuited to act as climate control systems for sensitive IT equipment, which functions within very clearly defined temperature parameters.

To veer away from these parameters, even slightly (and for a short time), will adversely affect their functional capability and reliability. If these temperature differences last for lengthy periods, they will shorten the expected lifespan of the equipment and, as we've mentioned, impact on the (potentially critical) systems that depend upon them.

While this highlights the problems that can be created for IT equipment through excess ambient heat, there is the added complication that IT systems themselves are also generating more heat. This heat - created by electrical resistance within their wiring and circuits - is rising due to the evolution of IT systems and electronic equipment in response to demands for ever-greater processing power, more storage, increased resilience, better productivity, and reduced running costs. It's also rising as rack density increases.