VERTIV WHITEPAPER

What is a BMC?

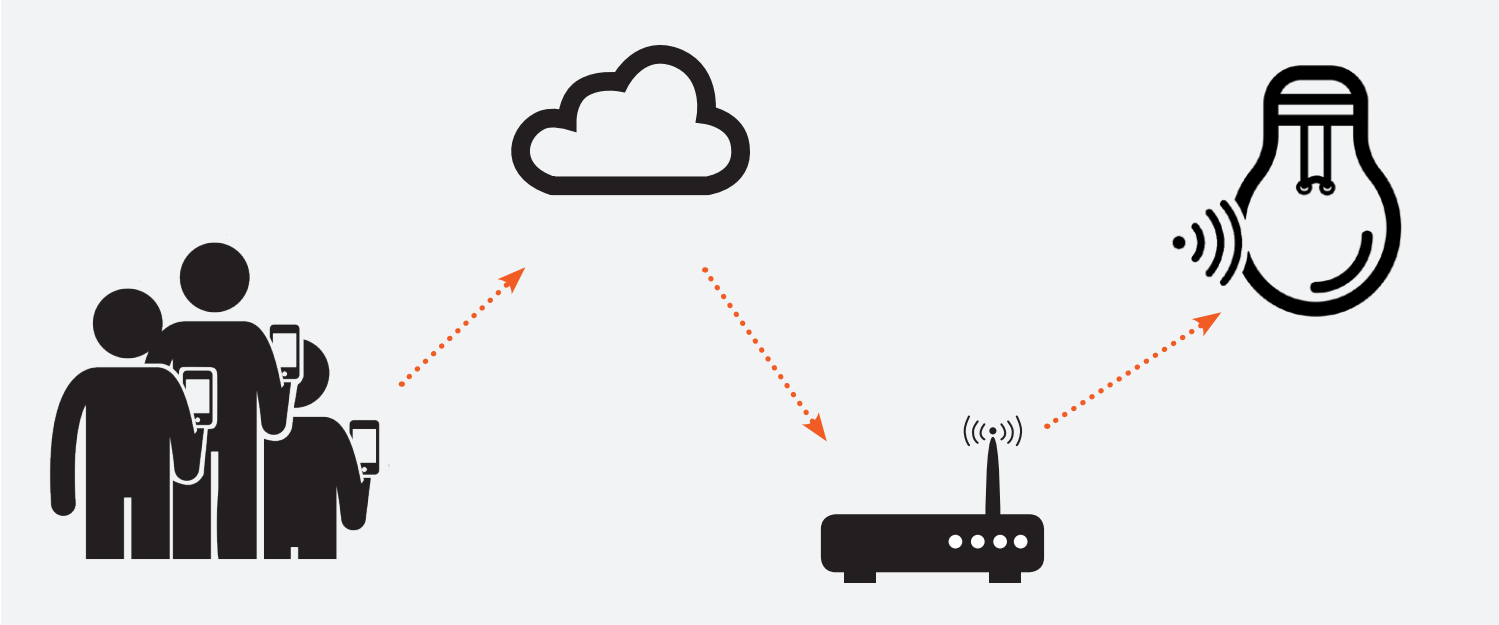
A BMC is a device that can help business save as much as $17000 per minute when something goes wrong. That's a bold statement! You'll probably want some clarification - that's coming. That doesn't tell you, however, what a BMC is physically and does functionally. Let's describe that first and work our ways back towards cost savings and the jobs to be done.

A BMC (Baseboard Management Controller) is a small, specialized processor that is shipped with servers, switches and other data center equipment. We'll stick with servers to keep things simple.

The BMC can be embedded on the same motherboard as a server CPU, or it can come in a plug-in (mezzanine) card. Like the CPU, the BMC has its own memory, persistent storage, and even dedicated network connections. It also has I/O ports to connect to hundreds of sensors in the server, and peripherals like fan and storage controllers. A special set of connectors are also available for communicating directly with the host CPU.

The BMC runs specialized management software that the industry calls "embedded firmware" (it's midway between hardware and software). Firmware is single purpose by design to handle hardware management down to a very fine level of detail and control, much like PC and server BIOS. The BMC firmware runs on Linux, but without some of the applications you find in distributions like Red Hat. Instead, special applications are packaged with Linux that are designed for managing the server and connecting I/O to peripheral devices, like the sensors mentioned earlier.

In many ways, a BMC is like a smart-home IoT gateway. Say you are at the Louvre in Paris, thinking "'wow, the Mona Lisa is a lot smaller than I imagined!" You suddenly realize that you forgot to turn off your lights at home in the United States. Luckily, you have an IoT gateway (think dedicated computer) in your home connected to your router on one end and a smart light bulb on the other. You go to an app on your smart phone, send a command, and, viola, the light turns off.



Now, imagine that instead of one smart light bulb, you have 250. They are all connected to your gateway along with your AC thermostat, humidity sensors, alarm system, oven, and door locks. Maybe you even spent a little more so you could see what your kids are watching at home on your HD TV. Through your IoT gateway, you would get alerts, control and see all the smart stuff in your home. That is what a BMC does at the server-level for data center operators and their IT equipment.

The BMC truly is a small embedded gateway running inside IT equipment. It's not a new concept. BMCs have been around in one form or another since the late 90s. Because of the BMC, data center operators and administrators can securely communicate with, configure, update and control a server from any location- network permitting. They can do this *even if the server operating system is not running.*

BMC's provide significant value when

- The server needs be rolled out and provisioned
- The server OS needs to be updated
- Something has gone wrong with the server

Ask any data center administrator and they'll tell all how painful the on-call experience can be. They will tell you about critical issues that come in the middle of the night like the boogey man. There is usually some service level agreement with the customer that must be met. If the administrator doesn't respond within, say 5 minutes, an angry customer will call your boss next. These agreements may sound extreme, but there are critical systems and application that can crash if the issue is not address quickly. To put this in perspective, the average cost of data center downtime is $9000 per minute and can go as high as $17000 per minute1. I told you we'd get there!

A former system administrator shared the following anecdote:

I'm reminded of the many times I received a severity 2 problem ticket (5 min to respond before escalation), at 3am, that server 'x' was down and not responding. Having remote power control capability to fire that server back up and make sure we were getting consistent pings and the app was back online saved us a tremendous amount of down time and money. Most of the time the server was shut down by user error. For example, someone opened a terminal session and they would accidently shutdown the server instead of logging off. Sometimes a service got killed that an application required. In those cases, I could simply launch a KVM session directly to the server and check services and fire it back up. They key is I could respond faster to problems when I had access to remote management. The key is I could easily deploy changes reducing my stress levels trying to meet SLAs. There were instances when remote service wasn't available because the BMCs had not been configured. I had to drive in to the Data Center 10 min away. I lived close-by, luckily. It took another 10 min to get into the data center and in front of the rack so I could simply press the power button. Yep, that happened some times and it was a huge pain.

At Vertiv, we know how these pains get in the way of your jobs to be done. Our mission is to alleviate the pain and help make your life easier so you can keep your apps running when the lights go out. The Avocent Team has delivered BMC solutions for over 15 years that have shipped on more than 30 million servers. We understand embedded management. More importantly, we understand the benefit to our customers and to the people who stay up at night keeping the Cloud running.

[1]Cost of Data Center Outages January 2016 Data Center Performance Benchmark Series, Ponemon Institute© Research Report

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