Memory Resilience Technology

From Intel® and AMI

Predict memory failures before they occur

Key Differentiation

With

Reliably predict commonly observed patterns of failure before they happen using advanced algorithms developed with machine learning

Solution improves over time as new versions of the algorithm are released

Use health data to modify replacement protocols, memory page offlining policies, etc.

Starting in Intel® Memory Resilience Technology 2.0, All memory errors, both Correctable Errors and Uncorrectable Errors, are recorded into the Error Log

Starting in Intel® Memory Resilience Technology 2.0, Correctable Memory Errors can be handled by the BMC on its own, which can save valuable CPU cycles

Without

Rely on simple solutions that are not "smart", like leaky-bucket

Continue to use stale solutions that date over time

Continue using current replacement protocols, memory page offlining policies, etc.
without finding new performance and/or cost-saving measures

Memory Errors resulting in a sudden crash may not be listed in the Error Log

Correctable Memory Errors reduce system performance

DIMM failures are one of the most common causes of server downtime, notorious for severely impacting system reliability, availability and serviceability (RAS).
These failures can be caused by a wide range of sources beyond normal use, such as manufacturing defects or extreme environmental or operating conditions.

What is Intel® Memory Resilience Technology?
Proactively predicts future memory failures before they occur

What problem does this solve?
Memory failures are among the most common hardware failures that occur in data centers today, severely impacting system reliability, availability, and serviceability (RAS)

Key benefits
Improves Data Center SLA's by giving more confidence and control over memory-related proactive decision making. Prediction reduces server downtime and potential for lost revenue

As a more complete solution designed to predict DDR4 memory failure before they occur, Intel® Memory Resilience Technology features several innovative and original capabilities.
It predicts micro-level failures in rows, columns and cells through pattern matching based on historical data, using a low-overhead online learning method to improve its prediction accuracy and avoid interfering with critical compute tasks.
This also enables Intel® Memory Resilience Technology to generate an estimated Memory Health and Ranking Score (MHRS) for proactive memory failure management.

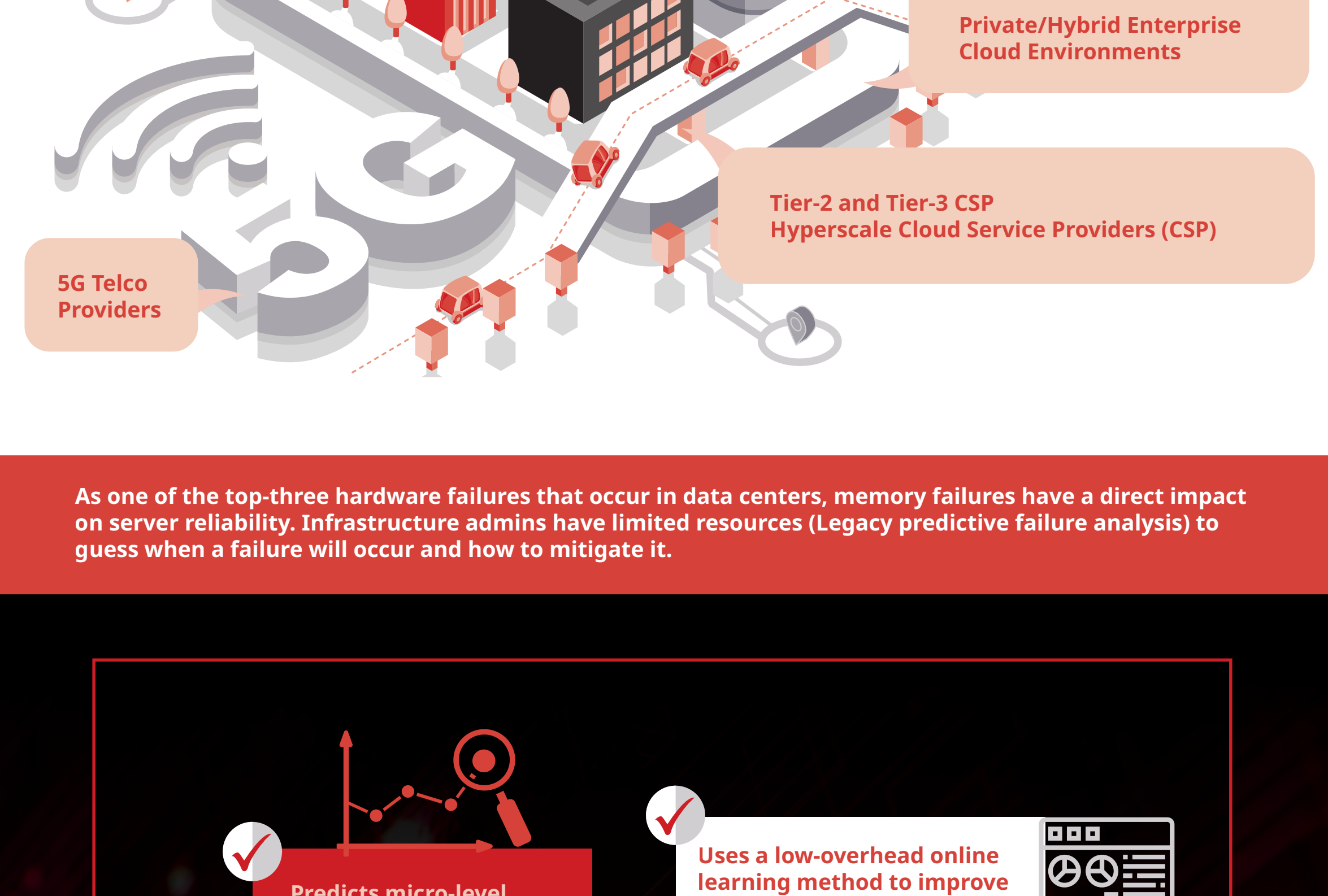
How does it work?
Leverages your existing AMI UEFI and BMC Solution.
Enabled with a MegaRAC Option Pack and Aptio V eModule.
AMI solution tracks the health score of each memory module and exposes the result for analysis to the system administrator.
Memory health score exposed **through several options:**

- MegaRAC WebUI
- RESTful APIs following DMTF Redfish standards
- AMI Composer

Hardware failures are all too common in large-scale data centers and cloud service infrastructure, and these failures can cause service level agreement (SLA) violations and severe loss of revenue.

Memory failures are among the most common and critical hardware failures that occur in data centers today, severely impacting system reliability, availability, and serviceability (RAS).

Verticals



As one of the top-three hardware failures that occur in data centers, memory failures have a direct impact on server reliability. Infrastructure admins have limited resources (Legacy predictive failure analysis) to guess when a failure will occur and how to mitigate it.

Features and Benefits

- Predicts micro-level DDR4 memory failures using pattern matching based on historical data
- Uses a low-overhead online learning method to improve its prediction accuracy and avoid interfering with critical compute tasks
- Generates estimated memory health and ranking score for proactive memory failure management
- Improves SLA by reducing failure rate through proactive memory health evaluation
- Higher DIMM performance and reliability optimizes workload and VM migration decision-making to boost efficiency, flexibility and TCO
- Improves DIMM toss policy which can reduce DIMM replacement costs
- Backed by world-class training and support from **AMI**

Leverages the most used UEFI and BMC solution in the industry with the same world-class technical support for the Aptio V eModule and the MegaRAC Option Pack that is represented by all AMI products

Requirements

For Aptio V UEFI Firmware: Intel® Memory Resilience Technology eModule

For MegaRAC BMC Firmware: Intel® Memory Resilience Technology Option Pack

For more information, please visit ami.com/initiatives

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