ONNEC VIEWPOINT

OUT WITH THE OLD, IN WITH THE NEW

Solving the Retrofitting Conundrum

A DATA CENTRE DOESNT NEED TO BE NEW TO BE FUTURE READY

The AI era has rewritten the data centre design brief.

As operators look to retrofit existing facilities to unlock capacity faster than new builds, they're running into a hard constraint in many markets: limited power availability and delayed grid connections are slowing fresh construction.

Retrofitting is a viable alternative, but it must be approached with caution. Many older sites built for around 5–10kW per rack are now no longer fit for today's denser workloads, which can demand 30–80kW per rack (and beyond) for GPU deployments.

A data centre doesn't have to be new to be future-ready, but retrofits need to be planned with future loads, networks, delivery constraints, and supply chain realities in mind. This viewpoint sets out 5 considerations to ensure retrofit programmes deliver future-ready capacity.

WHY RETROFIT NOW?

Retrofitting is an attractive alternative to create capacity for operators because the data centre is already there.

Operators can unlock speed-to-market, while new builds slow under grid, planning and supply chain constraints.

But the design brief has changed. Many facilities built 8–10 years ago were air-cooled and optimised for “classic” cloud loads in the 5–10kW-per-rack range. That baseline is now no longer fit for modern high-density compute, which requires materially more power, more sophisticated cooling and far greater network and fibre capacity.

This means retrofit priorities are changing. We are no longer talking about swapping out the kit. Instead, we must think about re-architecting an entire site as one system: power distribution, cooling approach, network pathways, cabling capacity, and the ability to phase work without unacceptable risk.

The decision between retrofit and rebuild usually comes down to two factors: how quickly capacity is needed, and whether the investment will deliver the performance and resilience operators are targeting. A rebuild makes sense where you can take a holistic approach, reworking power, cooling and layout end-to-end.

A live retrofit is often the better option when speed to market matters and the site’s constraints are workable, allowing you to upgrade in phases without disrupting service. But some facilities have hard limits that prevent reaching modern density targets. In those cases, the most future-ready choice may be to stop investing in incremental upgrades and plan for an alternative site or footprint.

MAKE RETROFITS FUTURE-READY: FIVE CONSIDERATIONS

There are five considerations operators should weigh up to ensure retrofitted data centres are future-ready for today's requirements and the next upgrade cycle.

1. RETROFIT SUITABILITY

DEFINE WHAT'S POSSIBLE, AND WHAT ISN'T

First, operators need a clear-eyed feasibility check on the building they already have. Older data centres are constrained by the fundamentals. Think slab-to-floor height, fixed risers, limited space and structural loading that was never intended for heavier, deeper racks or additional cooling infrastructure. **You can redesign layouts and refresh equipment, but you can't re-pour concrete.**

Power is similarly non-negotiable: incoming capacity is defined, and while you can redistribute within the facility, uprating grid supply is slow and uncertain. Cooling then becomes the make-or-break variable. Liquid or hybrid approaches may be essential for higher densities, but even "fully liquid" designs still depend on air cooling somewhere in the system and require space, routing and maintenance access. Finally, downtime tolerance sets hard and fast rules. If you can't take the site offline, every change must be engineered to protect live services and avoid unintended ripple effects.

2. HARDWARE UPGRADE FEASIBILITY

HOW FAR CAN YOU REFRESH WHAT'S ALREADY THERE?

Hardware upgrades are rarely limited by the IT refresh itself; they're bound by the facility's power and cooling envelope and the customer profile you're designing for. There are plenty of ways to increase supported loads without rebuilding from scratch. For example, containment changes, rear-door heat exchangers, targeted cooling upgrades, and rebalancing power distribution to match new density patterns.

But each option has trade-offs, and the "right" answer depends on the outcome you want for your ideal customer. Some operators find modernised infrastructure is more space-efficient in places, freeing room for supporting electrical equipment, but only if power and cooling can keep pace.

Crucially, "future-ready" means proving the upgrade before AI workloads go live: commissioning, integrated systems testing, validation against design intent, and a documented rollback plan if performance or resilience falls short.

3. FORWARD-LOOKING NETWORKS

THE HIDDEN LIMITER

Networks are often the constraint that arrives quietly, after the compute has been procured and the cooling plan approved. AI clusters expose this brutally. A deployment that “worked” two years ago using whatever was available can become a performance ceiling when bandwidth expectations leap and east–west traffic explodes. Once fibre pathways are congested or cabling becomes a patchwork, the next upgrade turns into a disruptive rebuild.

A future-ready network is designed for growth. That means engineered pathways with headroom, a structured cabling approach that avoids one-off sprawl, and component choices that anticipate upgrade cycles rather than locking you into yesterday’s constraints.

It also means treating network infrastructure as first-class critical components, not an afterthought. If you install a structured, high-density fibre foundation early, you materially reduce risk, cut change time, and make the next retrofit faster and less invasive.

4. PHASED REWORKS

HOW NOT TO BREAK A LIVE DATA CENTRE

For most operators, the real challenge isn't designing the end state. It's getting there without interrupting the services that fund the business. The ideal model is capital-heavy: build new capacity, migrate, then retrofit the old site. But this isn't practical for everyone.

The reality is a live retrofit, phased aisle-by-aisle to relocate workloads, isolate areas, complete fit-out, then repeat. That turns delivery into choreography, where sequencing is a continuity strategy, not a project plan detail. Best practice includes:

01. Map dependencies end-to-end before touching anything, including shared power, cooling and network routes.

02. Use tight change windows with explicit entry/exit criteria.

03. Isolate and contain work zones to protect airflow and avoid contaminants.

04. Stage cutovers with pre-defined test scripts and rollback steps.

05. Validate each phase against performance and resilience targets.

06. Keep stakeholders aligned with clear comms, especially where customer impact risk exists.

5. SUPPLY CHAIN VISIBILITY

BUILDABILITY IS NOW A DESIGN INPUT

Supply chain risk no longer sits neatly in procurement; it actively shapes what “future-ready” can mean and when you can deliver it. Chips get the headlines, but retrofit timelines often hinge on unglamorous components that can take a significant time to source, such as high-density fibre assemblies or specialist power equipment.

Under pressure, teams can fall into a trap of taking what they can get. This bakes bottlenecks into the site with an unsuitable fibre type, a compromised pathway or an ad hoc cabling sprawl that makes the next uplift painful.

Operators should feed procurement realities back into design decisions early. Then standardise where possible, qualify alternates, order long-lead items up front, use prefabrication to compress on-site time, and build realistic buffers into the schedule.

WHY EXPERT PARTNERS MATTER

Retrofitting is rarely something a single team can deliver alone.

In live environments, it becomes a tightly choreographed programme across power, cooling, networks, cabling, commissioning and change control. The biggest failure for retrofits is when those decisions are made in isolation. That's how "quiet liabilities" creep in: hard-to-upgrade cabling sprawl, cooling patchwork, undocumented dependencies, and compliance or resilience gaps that only surface when higher-density workloads go live.

The right specialist partners bring both design insight and delivery discipline. They help map feasibility and constraints early, treat the network as first-class infrastructure, and translate the target customer profile into practical power, cooling and connectivity choices. They also bring proven methods for safe decommissioning, working practices for live sites, structured phasing plans, rigorous testing and rollback, and procurement-led buildability to avoid delays and compromises.

Ultimately, future-ready retrofits are won on execution: coordinated engineering, controlled risk and repeatable upgrade paths, so the site can scale again, not just "go live once".

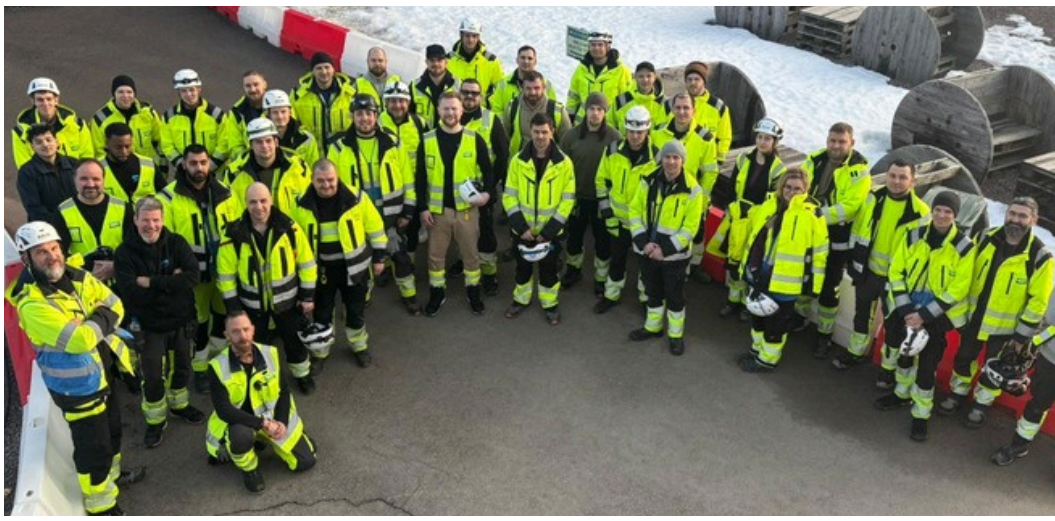
ABOUT ONNEC

Onnec is a leading independent IT infrastructure solutions and services partner, delivering for major organisations worldwide, every day. We specialise in structured cabling, managed services and advanced network solutions.

Our highly skilled designers, project managers and technicians, supported by world-class vendor partnerships, design, deliver and manage business-critical IT environments across the globe. Regardless of size or location, every project receives the same level of dedication, expertise and commitment to excellence that defines Onnec's work worldwide.

Onnec's expertise spans all environments and can support customers with:

- Structured cabling design and installation
- Installation of cabling, ODFs, PDUs, GPUs and containment solutions
- Network hardware installations, changes and support
- Connectivity and equipment upgrades and changes
- Smart Hands support services



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