

5G PRIVATE NETWORK SERVICES

Service definition

Crown Commercial Service G-Cloud 15

Lot 3 cloud support

Managed private SaaS/PaaS



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About Boldyn Networks

Boldyn Networks is one of the world's largest neutral host providers, delivering the advanced shared network infrastructure needed for a smart, inclusive and sustainable future.

We don't just talk about tomorrow. We build the foundation that makes it possible – enabling new opportunities across transport, enterprises, industry, education, government, military and cities.

Every environment is different. So is every customer.

That's why we take the time to understand your needs. Then deliver network solutions tailored to you. Our carrier-neutral inbuilding cloud solutions bring seamless mobile coverage where it matters most quickly and cost effectively. Inner city offices. High-density venues. Underground transport. Complex shopping centres. We've deployed indoor mobile connectivity in some of the world's most challenging environments - from Victorian-era tunnels to modern high-rises.

With headquarters in the UK and operations across North America, Europe and Asia, we bring the combined scale and global expertise to every project. Our global portfolio includes 300+ connected venues, 75+ US military bases, 130+ private networks, six major citywide transit systems serving 7.8 billion rides annually, 5 major citywide networks and even more connectivity solutions reaching over 1 billion people worldwide.

Majority owned by CPP Investments, one of the world's largest pension fund managers with C\$777.5 billion under management (as of September 2025), we have the financial strength and long-term vision to deliver on complex infrastructure partnerships that create lasting value.

Join us in unlocking the power of an interconnected future.



■ Introduction

The transformative power of 5G Private Networks for the UK public sector

5G Private Networks are emerging as one of the most powerful enablers of digital transformation across the UK public sector.

Designed to deliver ultra fast connectivity, low latency, high device density and enhanced security, 5G Private Networks go far beyond improving mobile broadband; they unlock new operational models, enable real time data intelligence, and support automation across critical services.

Mobile Private Networks are becoming the fundamental infrastructure for local authorities to become smart cities, for utility companies to monitor and manage critical remote assets; statutory port authorities to automate operations, and healthcare sectors to improve patient outcomes whilst driving down service delivery costs.

As a recognised industry leader in the Private Networks market, with over 130 networks delivered in diverse markets including smart cities, hospitals, utility companies and customers operating vital parts of the UK's Critical National Infrastructure, we understand your business imperatives to drive efficiency, reduce operational costs and secure your digital infrastructure against the increasing levels and sophistication of cyber attacks.

The Boldyn Networks **5G PRIVATE NETWORK SERVICE** is a **Managed Private Cloud** solution, combining Platform as a Service ("PaaS") and Software as a Service ("SaaS") elements, including a host of **Cloud Support Services**, to create a fully end-to-end designed, delivered, commissioned and managed service backed by Boldyn's standard Service Level Agreements.

The service is designed to greatly simplify the adoption of the transformative capabilities of 5G Private Networks through standardised, scalable capacity and coverage, all backed by Boldyn's Cyber Secure Network Operation Centre ("NOC"), accessible for service requests on a 24/7/365 basis.

Our service pricing model removes the need for up-front capital expenditure, with define baseline costs on 3-Year or 5-Year terms (commencing from completion of installation).

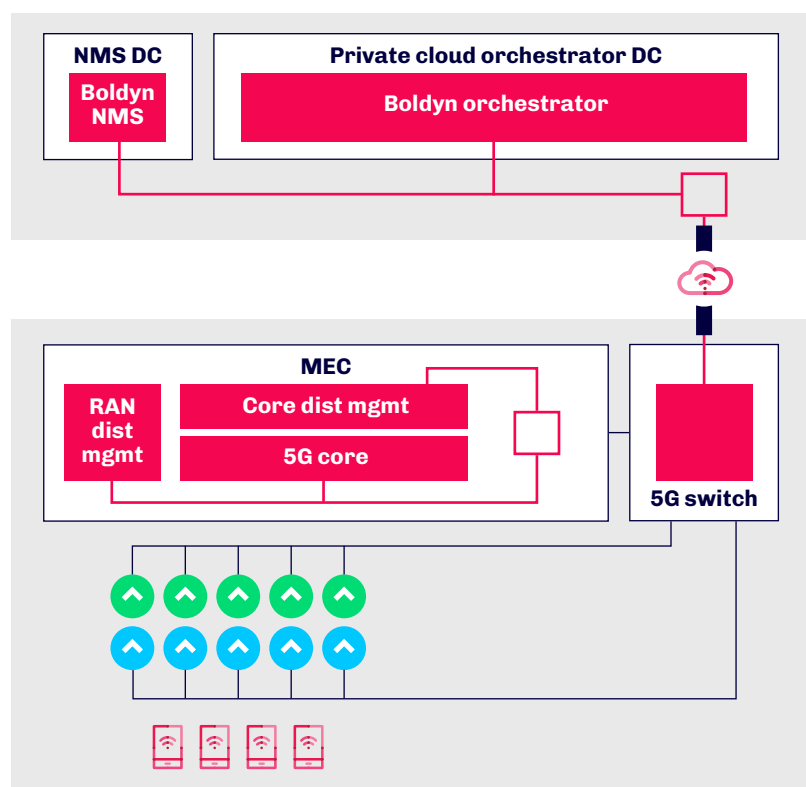
The baseline service offering for the 5G Private Network includes many of the Crown Commercial Service Lot 3 Cloud Support service categories in one single package, including:

Cloud support service	Description
Project management and governance	Dedicated Boldyn Project Manager working with customer's own resources to successfully deliver the on-premises 5G Core servers and switches in customer's own data centre. Easy-to-select additional project management options based on number and type of 5G radios needed (indoor and outdoor radios) Manage regular cadence of project reviews with customer
Service optimisation and right sizing	Site surveys to identify number and location of radios to deliver customer coverage and capacity needs
Security design	Cloud firewall services designed to ISO27001 standards and with Boldyn's Cyber Essentials Plus accreditation
Performance testing	Factory Acceptance Testing and Commissioning services ensure design meets customer orders
Operational readiness testing	Hand-over documentation of services to customer prior to Boldyn's internal hand-over to NOC services and management
Training (basic and super users)	Service management on-boarding for authorisation and training of customers' Service Administrator, Service Manager with tiered authorisation limits on Boldyn's Cloud Orchestrator platform
Advanced troubleshooting skills	UK NOC skilled professional support teams capable of troubleshooting network issues and escalation to Bolyn's vendor support as 3rd Line
Function and service optimisation skills	Professional services rate card for additional service to support integration of 5G Private Network functional applications and connected devices
Product support capabilities	Professional Services to support customer's identify solutions to enable transformation of wide range of services
Logging and management of incidents	Secure access to industry leading ticketing systems for incident management and reporting
Reporting and proactive results analysis	Monthly or quarterly reporting of service availability, incidents and resolution and analysis of network utilisation and potential areas of improvements
Dispatch of service technicians and/or parts	Resolution of incidents requiring service technician on-site within standard Service Level Agreement targets



■ Boldyn Networks Managed Private Cloud service description

This service combines a Cloud Orchestrator (a secure platform Boldyn runs in our cloud) with an on-site 5G Private Network Core at your location. The orchestrator is where services are created, users and devices are managed, and software is kept up to date. The on-site core is the foundation that delivers fast, local 5G connectivity to your devices and applications, even if your internet link to the orchestrator is busy or offline.



The Boldyn Managed Private Cloud service includes the following service components;

PaaS Cloud Orchestrator

What it does

The Cloud Orchestrator is the 'single pane of glass' that standardises and automates how your Managed Private Cloud 5G service is set up, changed, and maintained. It provides:

- Service catalogue and templates – consistent, pre-approved configurations for sites, policies, and features.
- Subscriber and device lifecycle – add, modify, suspend, and delete users and devices.
- Policy and slice management – assign priorities, bandwidth, and traffic policies to users, groups or applications.
- Automation and updates – push software updates and security patches to on-site cores with controlled change windows.
- Observability – health/status views, usage trends, and alerts integrated into our service desk.

Benefits

- Self-service with guardrails: Customer portal for safe day-to-day tasks (e.g., activating a device, changing a policy) while the platform enforces standards.
- Faster time to change: Common changes are catalogue-driven, cutting lead times.
- Consistency at scale: Every site follows the same golden patterns, reducing errors and support friction.

How it is secured

- Defence-in-depth: Strong identity, multi-factor authentication, role-based access control, and tamper-evident change logs.
- Encrypted management flows: On-site cores establish outbound-only, mutually authenticated, encrypted tunnels to the orchestrator; no inbound internet enablement is required at your site.
- Segregation of duties and data: Customer environments are logically isolated; least-privilege access is enforced for operations staff.





On-site 5G Private Network Core

On-premise equipment

A compact, rack-mountable set of appliances (or virtualised applications) delivered and maintained by Boldyn, typically consisting of:

- 5G Core functions (control and user data processing) to authenticate devices and route their traffic.
- Segmented IP transport equipment to keep management, control, and user data cleanly separated.
- Edge compute (MEC) to host the 5G Private Network Core and (optionally) some latency-sensitive apps close to your devices.
- Local management dashboard providing comprehensive network status, with all policy and lifecycle actions driven from the Cloud Orchestrator.

On-premise core benefits

- Performance and resilience: Critical traffic stays local for lower delay and continued operation during internet outages.
- Data sovereignty: Sensitive data can remain on premises by design, with clear policies for what (if anything) leaves the site.
- Determinism: Local control of radio and application paths means predictable performance for safety- and mission-critical use cases.

Resilience options

- Standard: Single on-site Core node (non-resilient).
- Optional:
 - High-availability on site (dual nodes with failover) for local 5G Core resilience.
 - Power resilience: dual PSUs, diverse power feeds, and UPS integration (dependent on customer availability).
 - Network resilience: dual uplinks, diverse ISPs, and protected radio backhaul.

Customer requirements

- Space and power required within an 800mm wide x 600mm deep communications cabinet for server installation.
- Internet connectivity to be provided for VPN connection for network monitoring and maintenance.
- Access availability to be facilitated to the server cabinet for field maintenance personnel.
- Access availability to be facilitated to the server cabinet for fault repair to meet any defined SLAs.

Orchestrator Cloud Connectivity

Internet-based model

Boldyn implements orchestration connectivity over secure internet links. The benefits of this approach are as follows:

- Faster to deploy: No dependency on long-lead time and expensive dedicated private circuits; sites can be brought live in days, not months.
- Cost-effective: Business-grade broadband/fibre with encryption offers excellent value for management traffic.
- Resilient by design: Dual ISPs or diverse paths can be implemented as an option; the on-site core continues to serve local traffic during upstream outages.

Security approach

- Outbound-only from site: The on-site core initiates the connection; no inbound firewall openings are required.
- End-to-end encryption: Mutually authenticated, encrypted tunnels (e.g., IPsec/SSL with strong ciphers) between site and orchestrator.
- Hard separation: Management/control traffic is segmented from user data; your on-site policies determine what user data, if any, traverses the tunnel.

Requirements for remote management

- Reliable internet access from the on-site core stack (via your corporate network or a dedicated WAN handoff).
- Allow outbound secure tunnels (e.g., HTTPS and IPsec/SSL) to Boldyn's cloud endpoints; public DNS and NTP reachability.
- Change control alignment: Agreed windows to push orchestrated updates and apply policy/template changes.



IP Transport Connectivity

What the Boldyn solution enables

The on-site 5G Core includes a carrier grade switching/routing layer that cleanly separates and prioritises different kinds of traffic so your enterprise network can connect with confidence and minimal risk.

VRF based separation:

Think of these as isolated, separate traffic flows on the same hardware:

- Management (for operations and monitoring)
- 5G control (signalling between radios and core)
- 5G user data (the actual device/application traffic)
- Application/edge (for MEC hosted workloads)

High performance by design:

- Non-blocking architecture, with line rate forwarding for typical 1Gbs, 10Gbs and optionally 25Gbs uplinks.
- Low latency paths between radios, core functions, and MEC to enable time sensitive apps.
- QoS (quality of service) so priority traffic (e.g., safety systems, control loops) gets the performance it needs.
- Support for jumbo frames where beneficial and agreed during design.

Easy IT integration (Standardised IT network requirements):

- **Flexible handoffs:** Layer 2 (VLAN trunk) or Layer 3 (routed) into your existing LAN/WAN.
- **Addressing:** we provide a clear IP plan; support RFC1918 addressing, DHCP relay, and DNS/NTP integration.
- **Routing:** static routes or dynamic (e.g., BGP/OSPF) where your standards prefer; route filtering to keep scopes clean.
- **Security controls:** per VRF firewall policies and ACLs.
- **Observability:** optional export logs/metrics to your tooling.
- **User plane policy:** you can keep sensitive user data local by default and expose only what's needed to enterprise apps.

The benefits of this approach

- Your corporate network team gets standard, well-understood interfaces.
- Segregation is built in, so connecting the private 5G service doesn't introduce surprises elsewhere on your LAN/WAN.
- Scale and upgrade paths exist (more bandwidth, more VRFs, more sites as optional future growth).

Radio options

We deploy up to 10 small-cell radios per site – indoor units for offices/production spaces and outdoor units for yards, perimeters and campus areas. Radios are coordinated by our on-site MEC platform, which also hosts the RAN management/controller software for zero-touch provisioning, monitoring and lifecycle management.

Spectrum

The Boldyn solution implements 5G coverage using n77 band (3.8-4.2GHz) with up to 100MHz carriers.

- Capacity with control: Ofcom's Shared Access Licence framework makes licensed 5G spectrum available in 3.8–4.2 GHz; ideal for 5G Private Networks on premises. This enables high throughput with predictable performance without relying on public mobile spectrum.
- A strong device and RAN ecosystem: n77 is a global 5G mid-band option; our radios support NR channel bandwidths up to 100 MHz, unlocking wide-channel efficiency for throughput and low latency. (Actual assigned bandwidth is subject to Ofcom coordination at your location.)
- Designed for local deployments: Ofcom's model is purpose-built for local wireless connectivity (low/medium power), with updated tools and coordination processes to ease planning and coexistence in 3.8–4.2 GHz.
- Deterministic capacity with wide channels: With Ofcom's n77 you can use contiguous 100 MHz channels on your site (subject to coordination), enabling higher peak rates and lower latency without contending with public users sharing the same carrier.
- Performance isolation beyond "slice" policy: A slice on a public network still shares spectrum, scheduler, and transport with other traffic. A private n77 carrier physically separates your RF resources, so busy hours on the public macro don't degrade your private workloads.

Performance

- Throughput per radio: With a 100 MHz NR carrier, our radio layer supports peak downlink ~600 Mbit/s per cell (typical frame profile) and uplink up to ~200 Mbit/s (UL-centric frame), subject to RF conditions, device capability, and configuration. (These are radio-layer peaks; end-to-end performance varies by environment.)
- Smooth mobility: The RAN natively supports connected-mode and idle-mode mobility across intra/inter-frequency boundaries, enabling seamless handovers between indoor and outdoor cells as people and machines move.
- QoS for critical apps: Multiple 5QI profiles (GBR and non-GBR) are supported, so safety-critical or latency-sensitive traffic can be prioritised consistently.

Self-Optimising Network (SON)

To minimise manual RF configurations and to keep service stable as the site evolves, the radios include SON capabilities:

- Plug-and-play with automatic provisioning to accelerate installs.
- Automatic neighbour relations (ANR) to build and maintain neighbour lists for reliable handovers.
- Auto-PCI selection and conflict avoidance, RACH optimisation, mobility robustness optimisation and frequent-handover mitigation to reduce interference, avoid 'ping-pong' events, and improve user experience.
- Mobility load balancing to steer traffic between cells and keep performance steady at busy times.
- Self-healing: Surrounding cells can adapt coverage if a neighbour experiences a fault, helping the network gracefully degrade rather than fail.

Indoor radio specification

- Frequency band: n77 (3800–4200 MHz)
- Channel bandwidth support: 40, 60, 80, 100 MHz
- MIMO configuration: 2T2R
- Modulation: DL – 256-QAM, UL – 64-QAM
- Antenna: High-gain internal antenna
- Synchronisation: GNSS, IEEE 1588v2 PTP, SyncE
- Backhaul interfaces: 1G SFP + 1G RJ45 copper
- Power: PoE++ (802.3bt Type 4) or –48V DC, max 40W
- Environmental:
 - IP30 rated
 - Operating temp: 0°C to +40°C
 - Designed for ceiling or wall mount

Outdoor radio specification

- Frequency band: n77 (3800–4000 MHz)
- Channel bandwidth support: 40, 60, 80, 100 MHz
- MIMO configuration: 2T2R
- Modulation: DL – 256-QAM, UL – 64-QAM
- Antenna: High-gain internal antenna
- Synchronisation: GNSS, IEEE 1588v2 PTP, SyncE
- Backhaul interfaces: 1G SFP + 1G RJ45 copper
- Power: PoE++ (802.3bt Type 4) or –48V DC, max 40W
- Environmental:
 - IP65 rated
 - Operating temp: -40°C to +55°C
 - Designed for pole / tower mount

Boldyn's standard Managed Private Cloud service is based on a maximum of 10 radios per customer.

Additional licences can be procured based on rate card.

To support our customers in determining the types, quantities and location of radios required at the customer site, Boldyn has included Cloud Support Services in a single order package. A baseline of a single radio (as a Minimum Viable Product) will include the following Cloud Support Services:

- Customer site survey (in mainland UK)
- Radio design (based on customer requirements for coverage and capacity)
- Low level design
- Installation drawings
- Project management support
- Installation, including connection to customer's 5G Private Network Core (within limits set out as baseline service)

Customers may select a combination of indoor and outdoor radios which includes:

****Additional radio licences are available based on rate card details**

Operational support

The Boldyn Managed Private Cloud service provides operational support from its London-based Network Operations Centre ("NOC"). The NOC will provide technical support to the customers' internal IT Service Desk teams.

The Boldyn NOC is backed by our key vendors' 3rd line support services throughout the service period of 3 or 5 years.

The NOC provides both e-mail and phone support and liaises with our vendors for 3rd line support services under contract, when required. It acts to coordinate any field service requirements that are identified through the triaging of service related incidents.

Boldyn's NOC supports customers' networks 24 hours a day, 7 days a week, 365 days a year. The NOC is staffed by highly trained and experienced network engineers, providing high-quality L1 and L2 support services.

The standard service package included in Boldyn's Managed Private Cloud service is based on Mon~Fri business hours support but tickets and service requests can be made 24/7/365 through the self-service portal**

The NOC integrates state-of-the-art technologies, sophisticated tools, and methodologies to monitor, manage, and optimise network performance to ensure seamless, high-quality network operations. The NOC Network Management System ("NMS") provides visibility of the status of the live 5G Private Network service, network performance metrics and fault alarms ranked by severity.

The NOC is the primary point of contact for customers for all technical support-related incidents. The proactive services that the NOC provides include:

24/7/365 remote monitoring

The NOC will continuously monitor the health and performance of the 5G network, including Core, RAN and transport infrastructure.

Proactive incident management

Real-time monitoring allows for the immediate identification of faults or performance degradation. Proactive management will ensure issues are addressed before they impact operations.

Helpdesk

Phone, email and ticket portal for raising service requests.

Network performance monitoring

Key Performance Indicators (KPIs) including:

- Network latency
- Data throughput
- System availability
- Radio signal strength
- Jitter
- Bandwidth availability and utilisation (real time and historic)
- End device connectivity status

All parameters for network performance will be agreed with RWE and OEG as part of the Service Management Framework and will be monitored to maintain network performance at agreed levels. Alerts will be triggered if KPIs fall below predefined thresholds.

Network incident management

In response to customer service requests received and incidents, including those detected pro-actively by the NOC that are not service impacting.

Incidents are managed from time of raising an incident and logged in our ticketing system through to resolution. All incidents are measured, recorded and reported against SLAs.

Any incidents requiring field maintenance services are coordinated by the NOC with the customer, taking account of safe working conditions and accessibility.

Network maintenance

Preventative maintenance activities will be scheduled with the customer throughout the service period, to ensure the network infrastructure remains in optimal condition. This includes software updates, hardware inspections, and routine checks to prevent potential issues and extend the lifespan of network components. It covers:

- Software maintenance and regular upgrades
- Security patch and vulnerability management
- Support for the change management process and implementation
- Spare part management

Customer dashboard

Many of our customers set up their own visual monitoring of the 5G PN in their Operations Centre, alongside their IT and OT monitoring tools.

The dashboard is an intuitive and user-friendly tool that offers real-time visibility into network performance, incidents, and service requests. This dashboard will enable customers to track KPIs, view historical data, and access reports, ensuring they have all the information they need to manage their network effectively.

Reporting

The NOC is an integral part of service management reviews and the preparation of service reports. The NOC will support collation of:

- Network performance KPIs
- Service requests status updates
- Maintenance activities
- Continuous improvement initiatives
- Network development support
- Optional reviews and presentations on technical updates and new product information as input to the future roadmap of the network.

Boldyn will provide monthly reports summarizing network performance, incidents, and any actions taken to maintain service levels. These reports will include network availability, incidents call-to-resolution times, and any planned or unplanned maintenance activities. Faults trend analysis will also be provided; by priority levels, progress status and resolution notes.

Periodic service reviews to assess overall network health, address any ongoing concerns, and plan for future upgrades or changes. This will include service requests status updates and continuous improvement initiative updates.

Spares status reports will cover:

- Spare inventory levels
- Spare returns management system status
- Spare provisioning status.

Support responsibility triage

The Boldyn NOC team will work closely with the customer's IT Service Desk to quickly identify the suspected cause of any failure of the systems and network components.

As part of the Low Level Design ("LLD") stage, Boldyn and the customer will jointly determine where the 5G MPN network relies on systems and infrastructure provided and supported by the customer, such as (but not limited to) existing ISP services, switches, cabling, firewalls.

A responsibility matrix will be developed prior to handover of services into live operations that identifies all equipment and ownership along with points of contact with the customer's IT support teams (including Out of Business Hours contact methods).

****Bespoke service agreements with service availability SLAs subject to separate agreement. Dependent on procurement of HA Core option, spares profile held on site and commercial model.**

The Boldyn Managed Private Cloud includes the following features and benefits:

Feature	Before	Boldyn IaaS Cloud
Cloud Based 5G Private Network orchestration	Customers procuring own dedicated licences	▪ Pooled licences provide far greater economies of scale ▪ Each customer service is securely containerised within the orchestration platform ▪ Customer still retains 5G Core and all data on site
5G radios	Customer procures as capital asset with limited warranties and support	▪ Included as part of managed service ▪ Radios warrantied and supported as part of Boldyn's managed Private Cloud 3 or 5 year terms
Spectrum licences	Customer may have to apply	▪ Boldyn undertakes all applications on customer's behalf
Service assurance	Customer left to determine devices and application suitability	▪ Boldyn Professional Services ready to support device and application integration
Remote management	Typically connected to NOC via leased line	▪ Customer's existing internet connection to Orchestrator secured by Boldyn
PaaS and SaaS	Customer required to secure capital investment	▪ Fixed and easily identified quarterly charges throughout the contract period



Service limitations and exclusions

Boldyn recognises customer environments may have unique requirements or limitations in their setting that falls outside of standard delivery models. To ensure our 5G Private Managed Cloud service is accurate, we have summarised service limitations and exclusions below.

These are purely for accuracy of Price Book submissions and do not reflect a limitation of Boldyn to overcome such limitations. Bespoke service elements or additional requirements are part of our capabilities and should not be considered as a barrier to service adoption.

Service element	Limitation and/or exclusion
RAN installation	Accessibility for radio installation does not include costs for specialised lifting platforms.
Customer infrastructure	Fibre / Power infrastructure is able to be utilised to within 30m of radio location.
Customer infrastructure	Customer firewalls are available for secure remote access.
Customer infrastructure	Existing infrastructure is available on which to mount the radio hardware.
Site access	Access to the installed Core and RAN hardware will be made available to allow any agreed SLA's to be achieved.
Customer infrastructure	LAN infrastructure is able to be utilised.
5G Core infrastructure	Rack space and power available for installation of core infrastructure.
Core availability	5G Core server and switch are single elements. Customer may order resiliency if required.
Devices	End user devices not included.
Operational support	Services provided on Monday~Friday Business Hours support with service priorities defined P1~P4. SLAs are target resolution. Extended 24/7/365 services can be supported with tighter SLAs subject to resiliency in design.
Change management	Network configured based on agreed customer requirements. Subsequent re-configuration due to a change in requirements not included.
Customer ISP service	Lease lines are excluded; scope is based on customer ISP connectivity being available.





Boldyn Networks delivers the advanced shared network infrastructure needed for a smart, inclusive, and sustainable future. We enable connected transit, venues, enterprises, heavy industry, college campuses and smart cities to create new possibilities in the way people live, work and play.

We don't just talk about the future. We exist to help build it. Creating the foundation from which a better collective future can be imagined.

To learn more visit **boldyn.com**