CERAGON

DISAGGREGATED WIRELESS HAULING –
STAYING AHEAD OF THE 5G CHALLENGE CURVE

IP-50 PLATFORM

MORE CAPACITY

THE MULTIDIMENSIONAL 5G HAULING CHALLENGE CURVE

As you evolve your network and services to 5G, past challenges are supplemented by additional requirements that together form a multidimensional challenge curve:

ACHIEVE MORE CAPACITY
This need derives from the total capacity per end device, and from the increased number of end devices.

DEPLOY MORE SITES
The need to deploy more sites derives from the need for higher capacity per area and the use of higher RAN frequency bands, which require much shorter distances between cell sites and end devices. This means massive network densification – with up to five times the number of cell sites in certain parts of the network.

ENABLE DIVERSE 5G USE CASES
Your network needs to support new services and use cases, and address new markets and requirements. Four game-changing sets of applications – enhanced mobile broadband (eMBB), ultra-reliable low-latency communications (URLLC), massive machine-type communications (mMTC), and fixed wireless access (FWA) – all need to be supported by the same network.
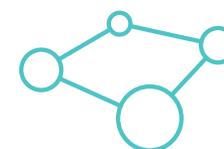
ACHIEVE MASS DEPLOYMENT
Keeping up with your business targets and shortening time to revenue requires fast mass deployment. You need to promptly deploy and connect new sites while optimizing resource use and overcoming scale & skill gaps.

All of these needs may result in a lack of timely solutions, as industry innovation falls behind the multidimensional challenge curve.

MORE SITES

DIVERSE 5G USE CASES

MASS DEPLOYMENT

DISAGGREGATED WIRELESS HAULING –
STAYING AHEAD OF THE 5G CHALLENGE CURVE

Resolving 5G wireless hauling challenges requires a new approach to wireless hauling – disaggregation. Rather than focusing on a single innovation path, disaggregation allows operating in multiple innovation paths and excelling in every one of them independently.

Ceragon redefines wireless hauling with the IP-50 Platform, which adopts the disaggregation model and implements three independent innovation paths.

STANDARD
NETWORKING HW

NETWORKING SW

A SINGLE RADIO

ALL-OUTDOOR RADIO /
SPLIT-MOUNT RADIO
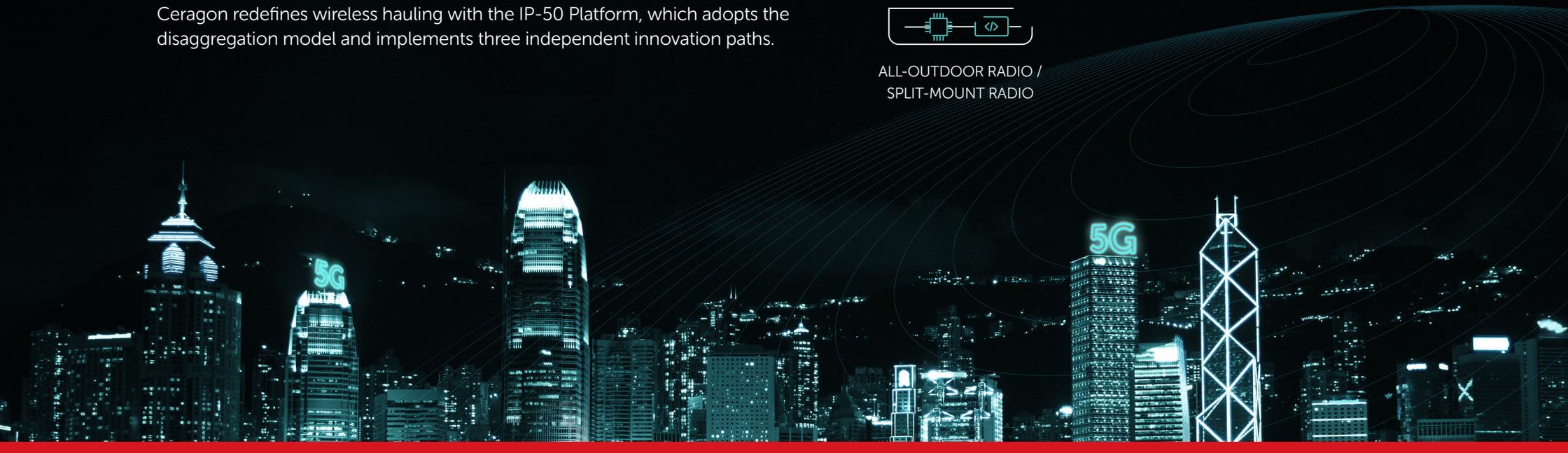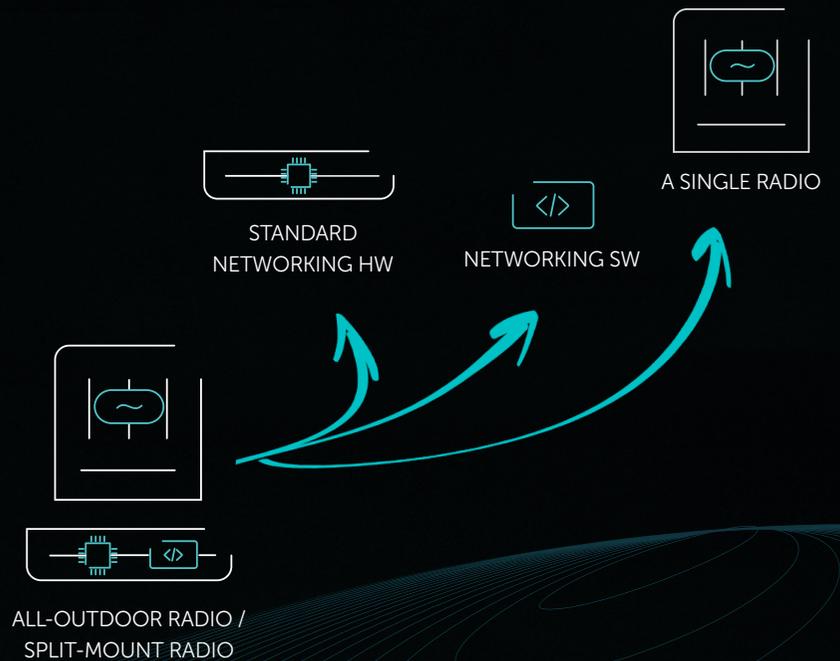
SINGLE RADIO

Thanks to Ceragon's unique multicore technology and decades of radio experience, you can achieve 4G & 5G capacity at any location, in any band. You can now have 4X the capacity with less resources and use new frequency bands. Leveraging multicore technology, you can gain additional capacity with no additional spectrum, densify your network without spectrum constraints, ramp up network capacity without truck rolls, and much more. Moreover, a single radio model can be used at any network scenario (all-outdoor, split-mount, all-indoor), supporting your mass deployment efforts and operational efficiency targets.
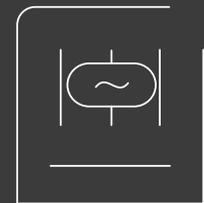
NETWORKING HARDWARE

Ceragon's wide variety of hardware options allows you to scale your network as required, achieving up to 100 times the capacity while adding interfaces where needed. This is done by developing Ceragon applications in a way that enables them to be executed on any standard merchant silicon, so you can leverage the industry's HW enhancements while leveraging the specific benefits of Ceragon's unique solutions.

NETWORKING SOFTWARE

Ceragon combines open SDN and state-of-the-art routing capabilities, such as segment-routing, to allow service orchestration via network slicing, fast service introduction and simpler, more efficient operations. This way, you can make sure each service type is accommodated with the right resources and SLA, regardless of other services running through your network, while keeping the network optimized and cost-efficient.

If your network strategy calls for integrated L3 IP/MPLS and segment routing in your backhaul, then the IP-50 platform is a perfect fit. You can also combine IP-50 products with Ceragon's IP-20 products for a case-by-case optimized solution.
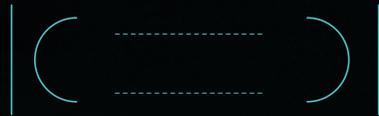
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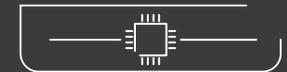
STANDARD NETWORKING HW

NETWORKING SW

OUR TECHNOLOGY – YOUR VALUE

5G CAPACITY GROWTH
1 click, double capacity

5G CAPACITY WITH NO COMPROMISE
Multiband

INCREASED LONG-HAUL EFFICIENCY AND FLEXIBILITY
Advanced Space Diversity (ASD)

SIMPLIFIESD 5G SITE ACQUISITION & INSTALLATION
All-outdoor solutions

5G CAPACITY IN NARROWBAND SPECTRUM
4x4 LoS MIMO

EASIER 5G NETWORK DENSIFICATION
Advanced Frequency Reuse (AFR)

IP-50E
20Gbps/link universal E-Band radio

The IP-50E universal E-Band radio introduces ultra-high capacity of up to 20Gbps to your network, supporting a pay-as-you-grow strategy with up to two units in XPIC configuration with layer-1 carrier bonding over a single cable. Wherever you need fiber-like capacity for fronthaul, backhaul or wireless access applications, the IP-50E is your cost-efficient, easy-to-deploy fiber-replacement solution.

The IP-50E also allows extended E-Band reach with no compromise on availability, thanks to its unique multiband capability. Using layer-1 carrier bonding, the IP-50E enables you to combine this high-capacity carrier with any additional microwave, fiber or leased line connection, thereby insuring your high-priority service offering meets its SLA target.

Combined with Ceragon's IP-50C or IP-20C radio and a multiband antenna, you can achieve a compact, all-outdoor, direct-mount 3-carrier solution (single-carrier E-Band + two-carrier microwave). This saves on tower load and shelter requirements while simplifying installation, allowing faster time to market, and enhancing operational efficiency.

SPECIFICATIONS

RADIO

- Radio capacity: 20Gbps (2+0 XPIC configuration, utilizing two units)
- Supported frequency bands: 71-86GHz
- Supported channel spacing: 62.5-2000MHz
- ACM steps: 9, BPSK-512QAM
- Antenna offering: parabolic, integrated flat panel (FCC, class-3 compliant), hitless multiband

INTERFACES

- 4 x 1/10GbE or 40GbE traffic interface (QSFP+)
- 1/10GbE traffic interface (SFP+, CPRI, eCPRI)
- 1GbE traffic interface (SFP) or 1/2.5GbE multiband port
- 1GbE management/PoE port

CAPACITY

- Networking capacity: 40Gbps
- Layer-1 carrier bonding: supports XPIC and multiband with any additional layer-1 connection

NETWORKING

Integrated Carrier Ethernet switching capabilities, MEF Carrier Ethernet 2.0 compliant | up to 30% more capacity using header deduplication | carrier-grade service resiliency (G.8032, MSTP) | SyncE and 1588 synchronization | ITU-T Y.1731 fault and performance management (MEF 35) | SDN | layer 3 (using IP-50FX)

SECURITY

AES-256 radio encryption | secured protocols and management interfaces (HTTPS, TLS, SSH, SNMPv3) | secured architecture and software design | advanced authentication and identification management

IP-50E SPOTLIGHT USE CASE
4G & 5G fronthaul

BBU/DU

50 IP-50E

CPRI/eCPRI

50 IP-50E

RRH/RU
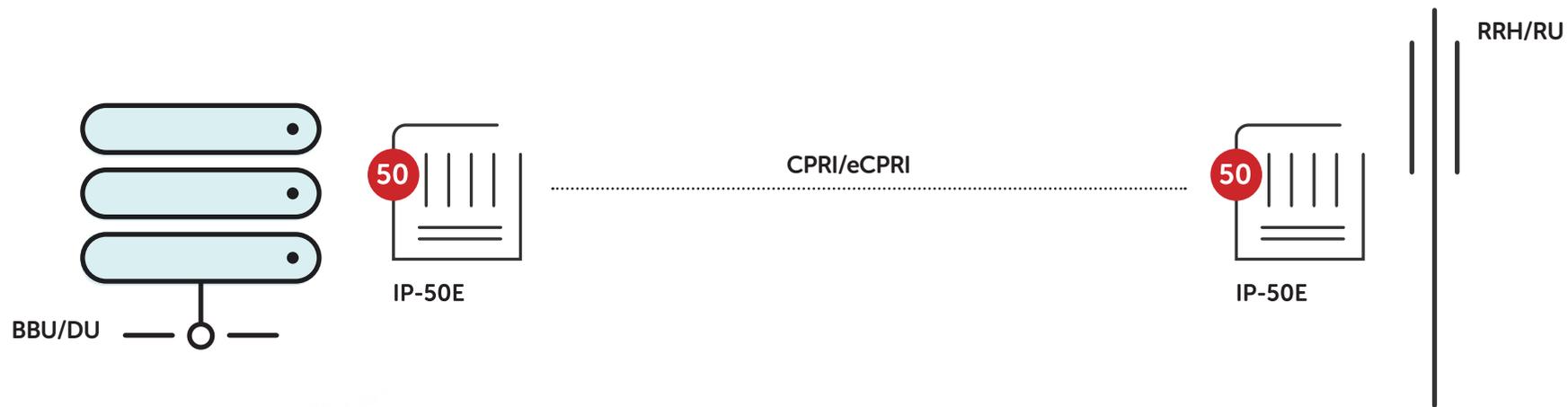
IP-50C

Universal multicore microwave radio for all deployment scenarios

The world's best all-outdoor microwave radio just became better. The IP-50C universal microwave radio is the evolution of the IP-20C, the world's best-selling wireless backhaul outdoor radio. The IP-50C brings new capabilities that allow you to base your entire network, from small cells to massive aggregation sites, on this single radio – reducing complexity, costs and time to revenue.

The IP-50C can be deployed as a stand-alone all-outdoor radio, or combined with an indoor unit (the IP-50FX) as a scalable aggregation node and cell site router. Either way, you can leverage all the benefits of Ceragon's cutting-edge multicore technology.

A unique configuration of an all-outdoor 4+0 node (utilizing layer-1 carrier aggregation) allows you to achieve up to 8Gbps by layer-1 carrier bonding without a need for an additional indoor unit. Moreover, using the IP-50C, you may upgrade your existing all-outdoor installed base (whether Ceragon IP-20C 2+0 or any third-party all-outdoor) into 4+0 using layer-1 carrier bonding. This enables you to turn more sites in your network into all-outdoor sites, thereby reducing time to market, lowering CAPEX and OPEX, and simplifying site acquisition tasks.

SPECIFICATIONS

RADIO

- Supported frequency bands: 6-42GHz
- Supported channel spacing: 3.5-224MHz
- ACM steps: 12, BPSK-4096QAM
- 4x4 LoS MIMO
- Advanced Frequency Reuse
- Advanced Space Diversity
- Remote 2nd carrier activation

INTERFACES

- 1/10GbE (electric)
- 10GbE (SFP+)
- 1/2.5GbE (SFP)
- 10GbE extension port for advanced features or traffic interface (SFP+)

CAPACITY

- Networking capacity: 16Gbps
- System capacity: 8Gbps (in 4+0 configuration)
- Layer-1 carrier bonding: Up to 4+0 in an all-outdoor configuration using a single cable

NETWORKING

Integrated Carrier Ethernet switching capabilities, MEF Carrier Ethernet 2.0 compliant | up to 30% more capacity using header deduplication | carrier-grade service resiliency (G.8032, MSTP) | SyncE and 1588 synchronization | ITU-T Y.1731 fault and performance management (MEF 35) | SDN | layer 3 (using IP-50FX)

SECURITY

AES-256 radio encryption | secured protocols and management interfaces (HTTPS, TLS, SSH, SNMPv3) | secured architecture and software design | advanced authentication and identification management

IP-50C SPOTLIGHT USE CASE
High-capacity all-outdoor enterprise connectivity

Remote enterprise

50 IP-50C

50 IP-50C

4+0 all-outdoor
Layer-1 carrier bonding

50 IP-50C

50 IP-50C

Fiber POP

IP-50S
Universal microwave radio
for all deployment scenarios

Designed with innovation in mind, the IP-50S features high capacity of up to 2Gbps over a single carrier, while combining all the benefits of disaggregated wireless backhaul. A compact, cost-optimized universal radio, Ceragon's IP-50S considerably simplifies installation time and efforts on site to further accelerate the deployment of wireless broadband networks in rural and suburban areas.

The IP-50S can be deployed as a stand-alone all-outdoor radio or used as an upgrade path to achieve the highest possible capacity of any existing Ceragon or third-party link by utilizing Ceragon's unique layer-1 carrier bonding. Ceragon's unique multiband engine allows the combination of any two microwave channels over the air,

and significantly enhances the link's performance by optimizing traffic distribution between the two carriers. Retaining the same network configuration and cabling while upgrading existing links presents additional benefits to mobile operators and enables them to lower total cost of ownership.

Supported channel bandwidth up to 224MHz and modulation up to 4096QAM at traditional higher bands allow IP-50S to operate with transmission rates up to 2.0 Gbps for 1+0 configuration. The radio's compact form factor and optional integrated flat-panel antenna significantly minimize your sites' physical footprint, enabling prompt deployment, faster time to market, and enhanced operational efficiency.

SPECIFICATIONS

RADIO

- Supported frequency bands: 6-42GHz
- Supported channel spacing: 14-224MHz
- ACM steps: 12, BPSK-4096QAM

INTERFACES

- 1GbE (electric) traffic port
- 10GbE (SFP+) traffic port
- 1GbE extension port for advanced features and traffic

CAPACITY

- Networking capacity: 5Gbps
- Layer-1 carrier bonding: up to 3+0 configuration using a single cable
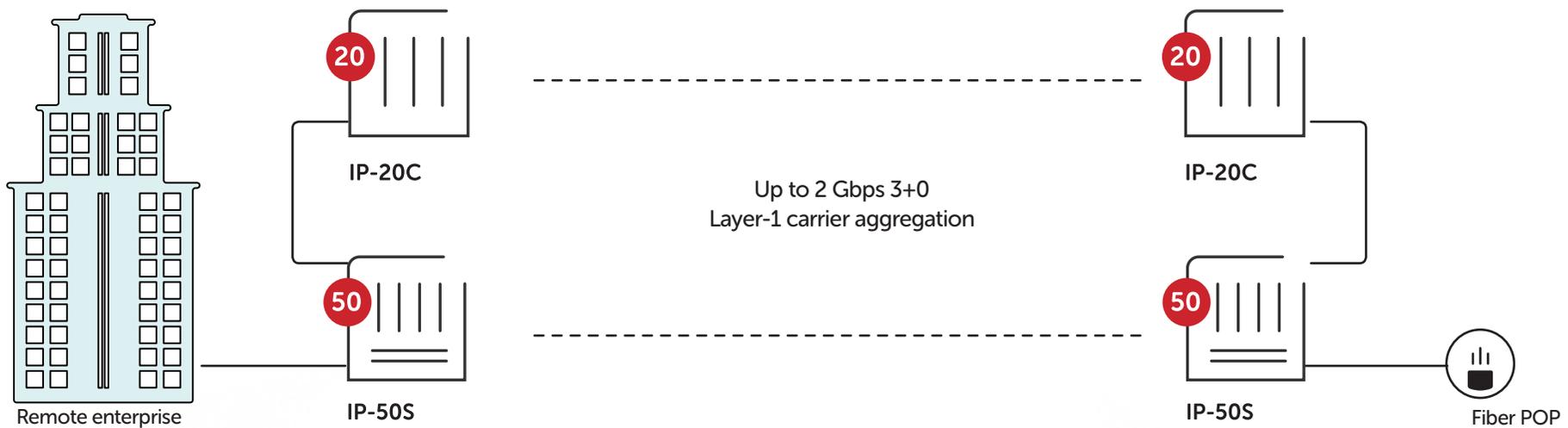
NETWORKING

Integrated Carrier Ethernet switching capabilities, MEF Carrier Ethernet 2.0 compliant | up to 30% more capacity using header deduplication | carrier-grade service resiliency (G.8032, MSTP) | SyncE and 1588 synchronization | ITU-T Y.1731 fault and performance management (MEF 35) | SDN | layer 3 (using IP-50FX)

SECURITY

AES-256 radio encryption | secured protocols and management interfaces (HTTPS, TLS, SSH, SNMPv3) | secured architecture and software design | advanced authentication and identification management

IP-50S SPOTLIGHT USE CASE
Quick upgrade to existing links

IP-20C 20

IP-20C 20

Up to 2 Gbps 3+0
Layer-1 carrier aggregation

IP-50S 50

IP-50S 50

Remote enterprise

Fiber POP

IP-50FX
Disaggregated wireless hauling router

The IP-50FX wireless hauling router combines a cell site router with radio-aware features that support the IP-50C and IP-50E radios, as well as any Ethernet-connected radio or fiber. Its high switching capacity and wide port density make it an excellent fit for any cell site or aggregation site that requires ultra-high capacity, multi-directional functionality, and switching/routing capabilities.

The IP 50FX utilizes radio-aware networking capabilities, such as layer-1 carrier bonding over Ethernet, SyncE, 1588-TC/BC and ETH-BN. This enables the router to serve as a revolutionary solution for any multi-carrier requirement – you can create a high-capacity trunk with any outdoor radio connected via Ethernet. The IP-50FX leverages software and hardware disaggregation to create an ultra-scalable platform. You can increase capacity and interfaces by simply choosing another hardware variant while keeping all software functionality and product look & feel intact.

When multi-carrier configuration calls for more than four carriers, with layer-1 carrier bonding for best utilization of the spectral resources, the IP-50FX is your answer. The wireless hauling router can connect to any combination of Ethernet-connected radio 8+0 constellation and act as an indoor unit, performing layer-1 carrier bonding.

SPECIFICATIONS

NETWORKING

Switching capacity
Starting from 64Gbps

Interfaces in basic configuration
- 6x10GbE (SFP+)
- 16x1GbE (SFP)

Layer-1 carrier bonding
Up to 16+0
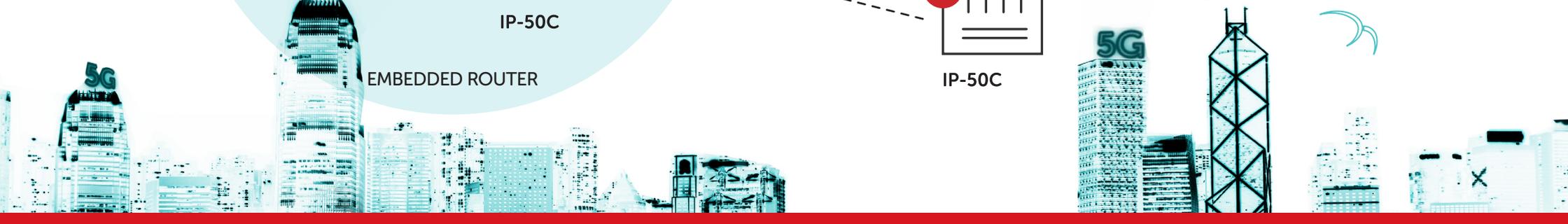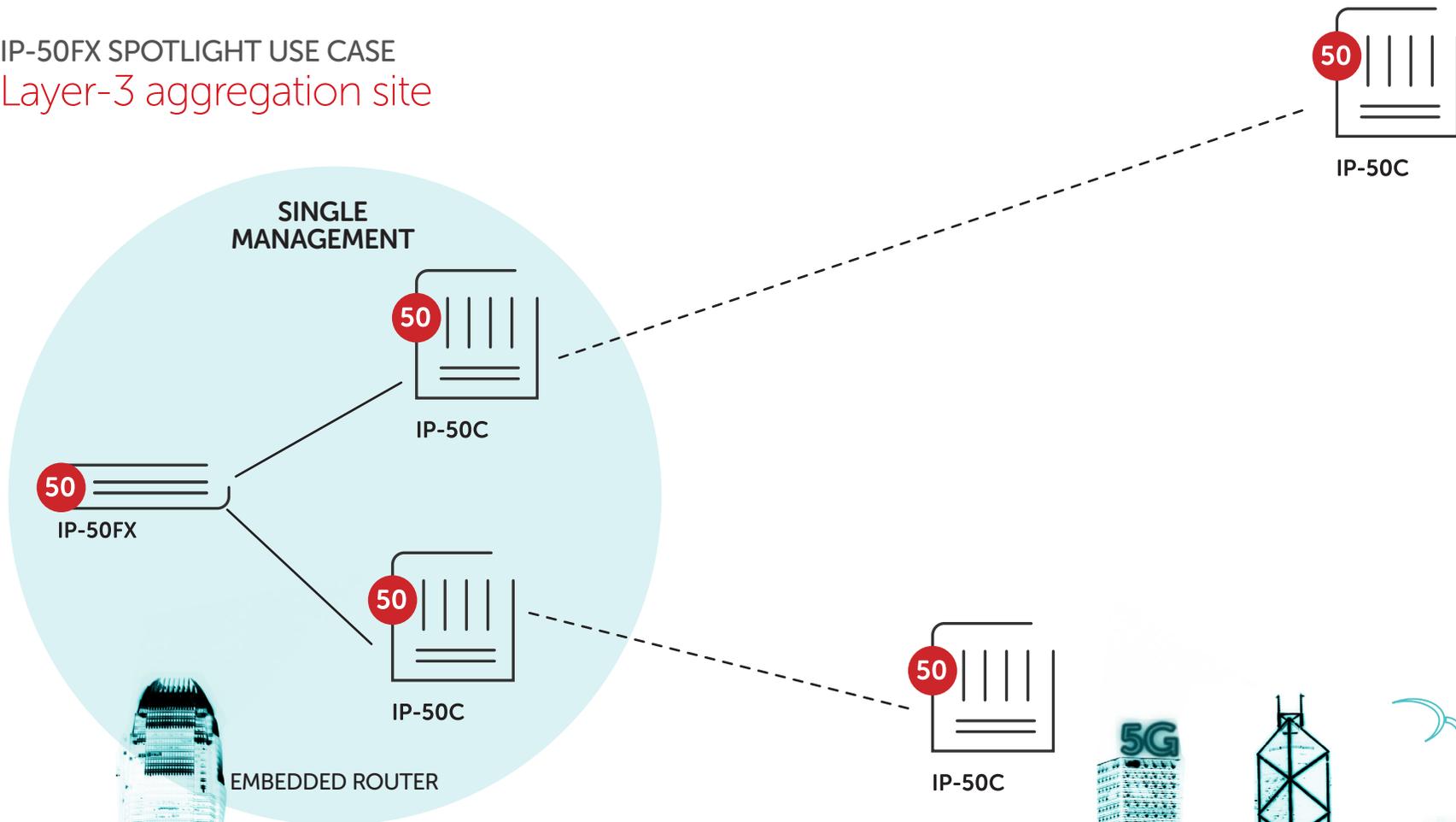
Quality of service
3 levels of HQoS

OAM functionality
ETH-BN according to ITU-T G.8013/Y.1731

Open SW standards
complies with ONL/ONIE layer-1 carrier bonding, supports multiband with any additional layer-1 connection

IP-50FX SPOTLIGHT USE CASE
Layer-3 aggregation site

SINGLE MANAGEMENT

50 IP-50C

50 IP-50C

50 IP-50FX

50 IP-50C

EMBEDDED ROUTER

50 IP-50C

CERAGON

CHALLENGE US
TO TAKE YOU FURTHER

About Ceragon

Ceragon Networks Ltd. is the world's #1 wireless backhaul specialist. We help operators and other service providers worldwide increase operational efficiency and enhance end customers' quality of experience with innovative wireless backhaul solutions. Our customers include wireless service providers, public safety organizations, government agencies and utility companies, which use our solutions to deliver 4G, mission-critical multimedia services and other applications at high reliability and speed. Ceragon's unique multicore technology provides a highly reliable, high-capacity 4G & 5Gwireless backhaul with minimal use of spectrum, power and other resources. It enables increased productivity, as well as simple and quick network modernization. We deliver a range of professional services that ensure efficient network rollout and optimization to achieve the highest value for our customers. Our solutions are deployed by more than 460 service providers, as well as hundreds of private network owners, in more than 130 countries.

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