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amdocs open ecosystem accelerator for disaggregated cell site gateway

5G promises to boost data speeds, increase bandwidth and network capacity, while also enabling new applications based on ultra-low latency/less lag and high availability, as well as offering massive Internet of Things (IoT) scale. This network evolution is driving transport network upgrades and paving the path towards disaggregation. Yet the fundamental shift towards open, multi-vendor networks needs to overcome current transport network challenges.

Current cell site gateways limitations

Mobile base stations typically connect to a cell site gateway using RJ45 or SFP Gigabit Ethernet interfaces. However, to accommodate the increased capacity required in modern 4G and 5G networks, base stations will also use 10 Gigabit Ethernet SFP+ interfaces. This makes most currently deployed cell site routers unsuitable to carry 5G base station traffic.

Traditional routers provide a monolithic package of hardware and software from a single vendor. While in the past, this model has provided benefits like guaranteed hardware/software interoperability and a single point of contact for purchasing, service and support, today it creates several challenges for network operators. The significant vendor lock-in of proprietary, closed routers and the small number of router vendors result in limited pricing pressure and high costs. Meanwhile, innovation is dependent on the capabilities of the single selected vendor

rather than an ecosystem, and network operators are prevented from leveraging different rates of hardware and software innovation independently or selecting best-of-breed hardware and software independently.

To accommodate ever-growing network infrastructure bandwidth requirements with solutions that are future-proof, while also reducing capex and opex and enabling automation & agility to introduce new services, the transport network needs to be upgraded and provisioned with disaggregation.

As connectivity, automation and artificial intelligence accelerate ever-increasing user expectations for instant access to data, service providers need agile networks to evolve, scale and launch new innovative services. To compete effectively, service providers must therefore adopt a disaggregated cell site gateway strategy by addressing the current transport network challenges.

Figure 1: Network challenges

Monolithic hardware and software from single vendor

Vendor lock-in with proprietary interfaces

High opex and capex

Limited innovation

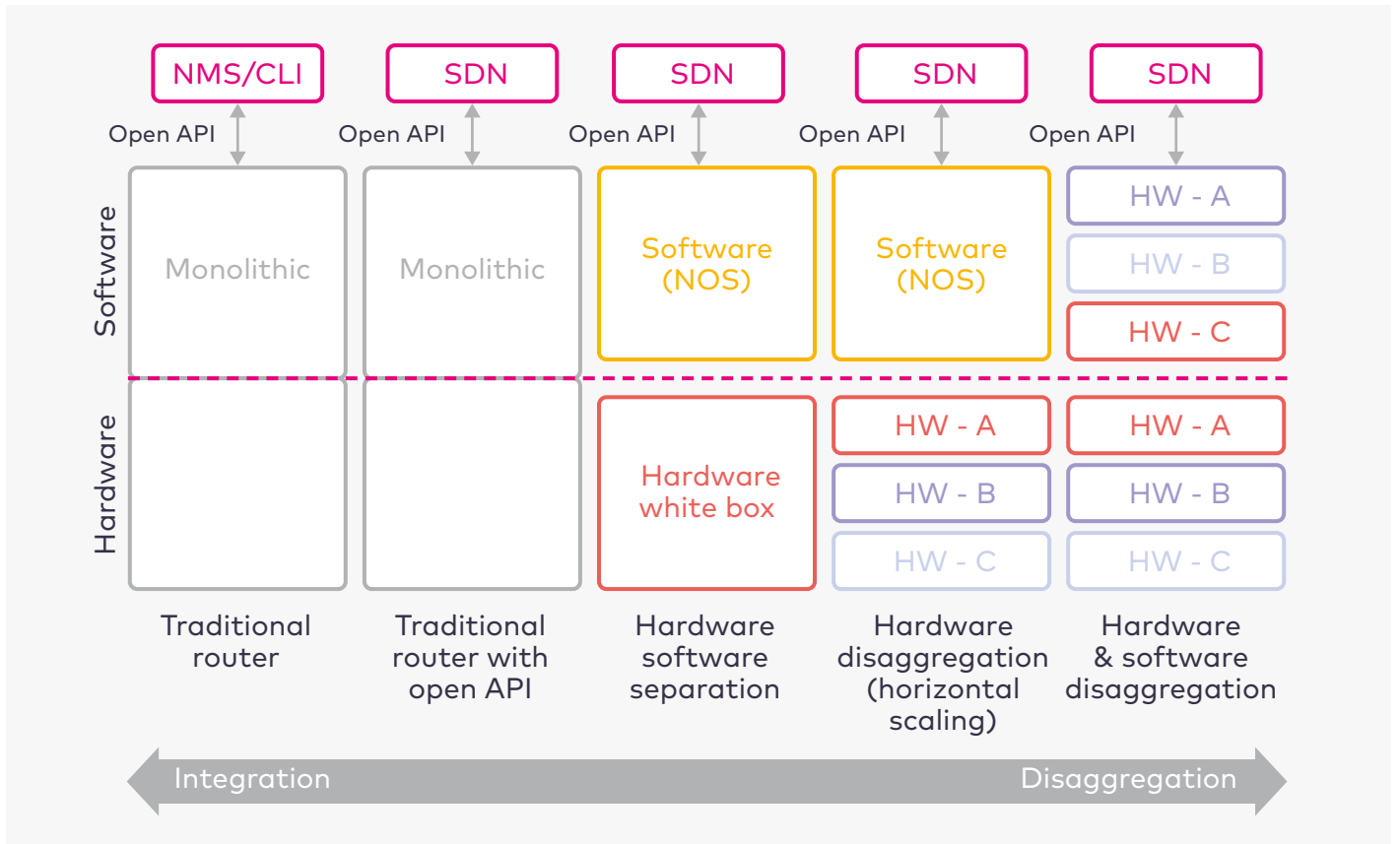**What is a Disaggregated Cell Site Gateway (DCSG)?**

At its most basic level, disaggregated routing separates router software and hardware. The hardware becomes a white box based on merchant silicon, also known as a bare metal switch. Meanwhile, the software becomes a network operating system (NOS). While the hardware and NOS can come from different vendors, it is not possible to just take any white box and load any NOS.

Disaggregation hardware – software separation

NOS

Routing software

- - - - - - Disaggregation - - - - - -

Routing hardware

White box hardware/
bare metal switch
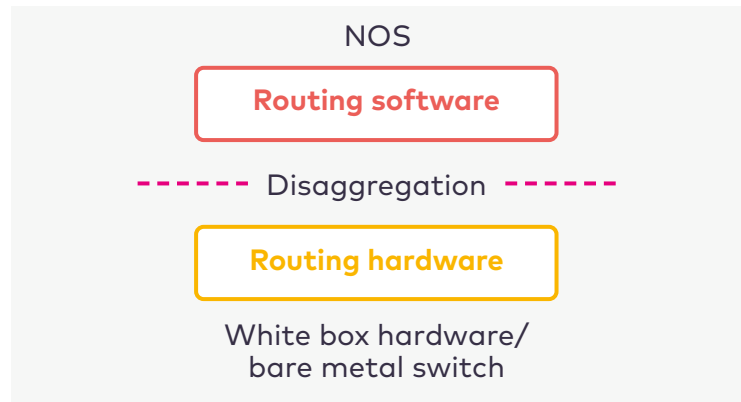
Disaggregation is not binary but rather exists on a spectrum. A first step from traditional routers with command line interface (CLI)-based configuration and/ or network management system (NMS)-based management is the transition to software-defined networking (SDN) and open application programming interfaces (APIs) based on NETCONF. This lowers operational expenditure (opex), increases programmability and provides the option to disaggregate some control plane functionality from the network element to the SDN controller/orchestrator. Beyond the basic separation of software and hardware, the different hardware elements of a chassis-based router can also be disaggregated to enable horizontal scaling. Horizontal scaling means scaling by adding more "machines," or in this case, white boxes, as opposed to vertical scaling, thereby upgrading the power of existing machines.
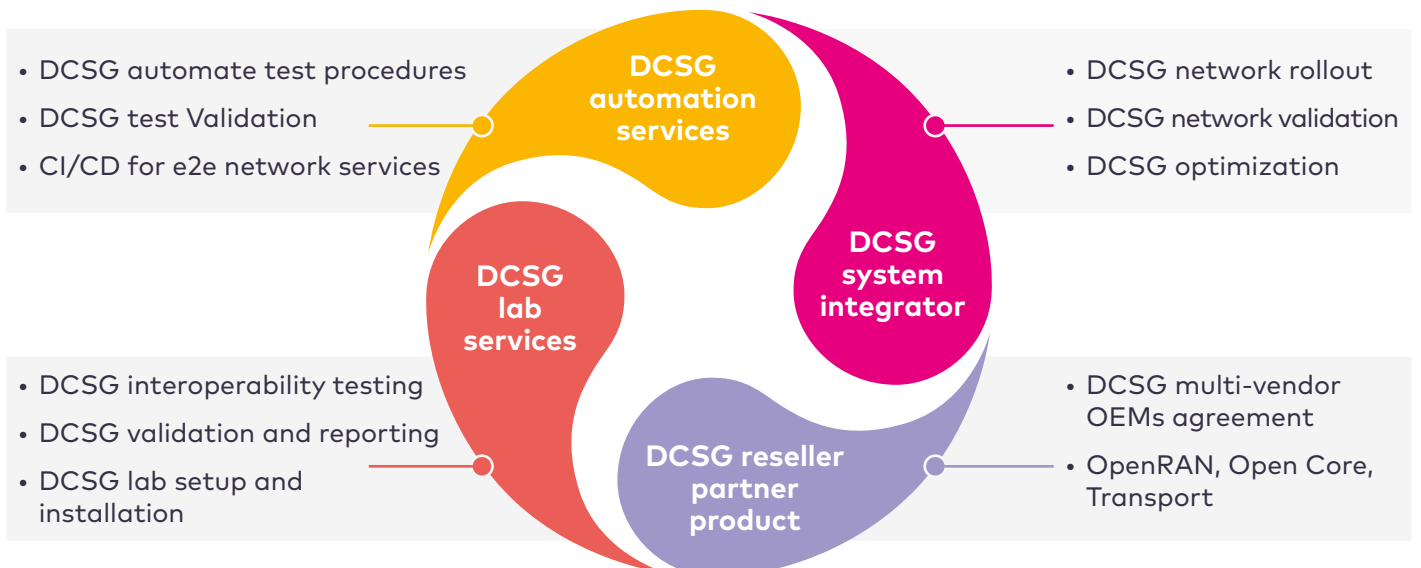
Router disaggregation spectrum

	NMS/CLI	SDN	SDN	SDN	SDN
	Open API	Open API	Open API	Open API	Open API
Software	Monolithic	Monolithic	Software (NOS)	Software (NOS)	HW - A / HW - B / HW - C
Hardware			Hardware white box	HW - A / HW - B / HW - C	HW - A / HW - B / HW - C
	Traditional router	Traditional router with open API	Hardware software separation	Hardware disaggregation (horizontal scaling)	Hardware & software disaggregation

Integration ← → Disaggregation

Amdocs Open Ecosystem Accelerator for Disaggregated Cell Site Gateway (DCSG)

Amdocs Open Ecosystem Accelerator for DCSG provides a comprehensive set of open network solution and services that minimizes risk during the transition. In addition, we have carefully evaluated product technology, hardware and software vendors from the Telcom Infra Project (TIP) community, and established reseller agreements with various members.

Amdocs DCSG offering

DCSG automation services
- DCSG automate test procedures
- DCSG test Validation
- CI/CD for e2e network services

DCSG system integrator
- DCSG network rollout
- DCSG network validation
- DCSG optimization

DCSG lab services
- DCSG interoperability testing
- DCSG validation and reporting
- DCSG lab setup and installation

DCSG reseller partner product
- DCSG multi-vendor OEMs agreement
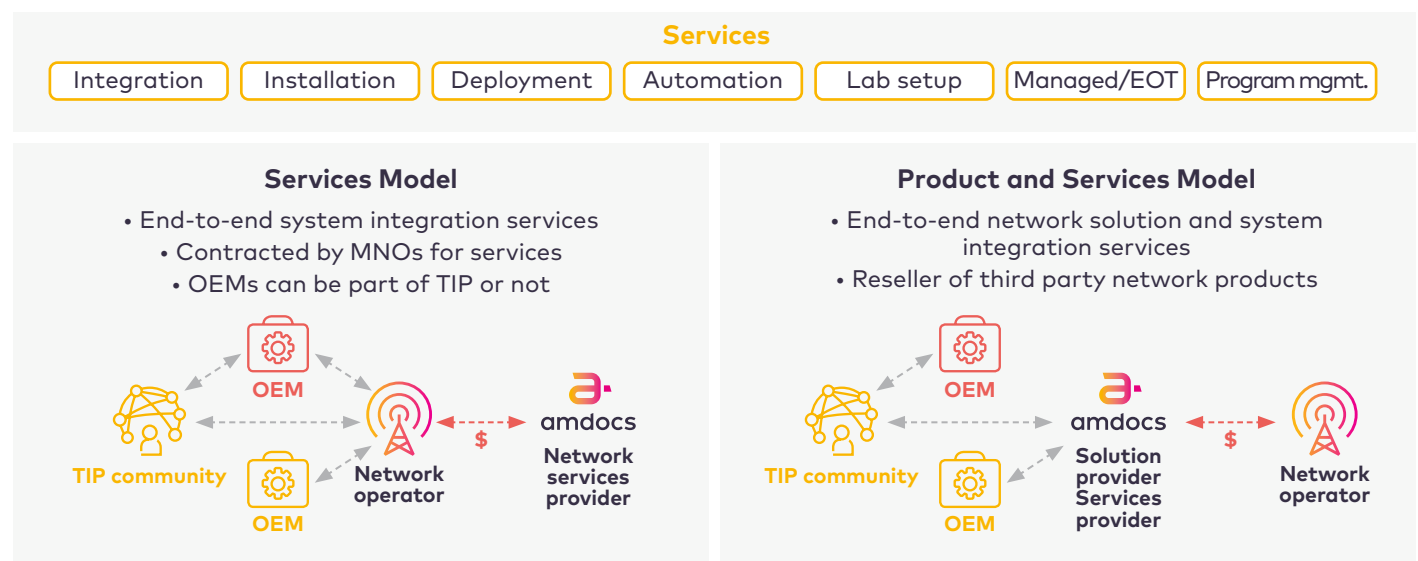- OpenRAN, Open Core, Transport

Amdocs Open Ecosystem Accelerator for DCSG includes:

• DCSG System Integrator services for network operators who are in the process of deploying DCSG hardware and software in their networks.

• DCSG reseller partner products to ease the process of buying, deploying and supporting the new technology, hardware and software for the network operators.

• DCSG lab services to test various DCSG hardware and software combinations for specific use cases in their labs.

• DCSG automation services to carry out automated test/ use cases on their DCSG hardware and software OEM combinations.

Two engagement model options are available – Services model and Product & Services model. The Product and Services model enables quick time to market using an end-to-end solution and services, while the Services model includes installation, integration, commissioning, testing, verification and managed (EOT) services designed for open networks.

Amdocs DCSG engagement models

Services

| Integration | Installation | Deployment | Automation | Lab setup | Managed/EOT | Program mgmt. |

Services Model
• End-to-end system integration services
• Contracted by MNOs for services
• OEMs can be part of TIP or not

OEM
TIP community
OEM
Network operator
$
amdocs
Network services provider

Product and Services Model
• End-to-end network solution and system integration services
• Reseller of third party network products

OEM
TIP community
OEM
amdocs
Solution provider Services provider
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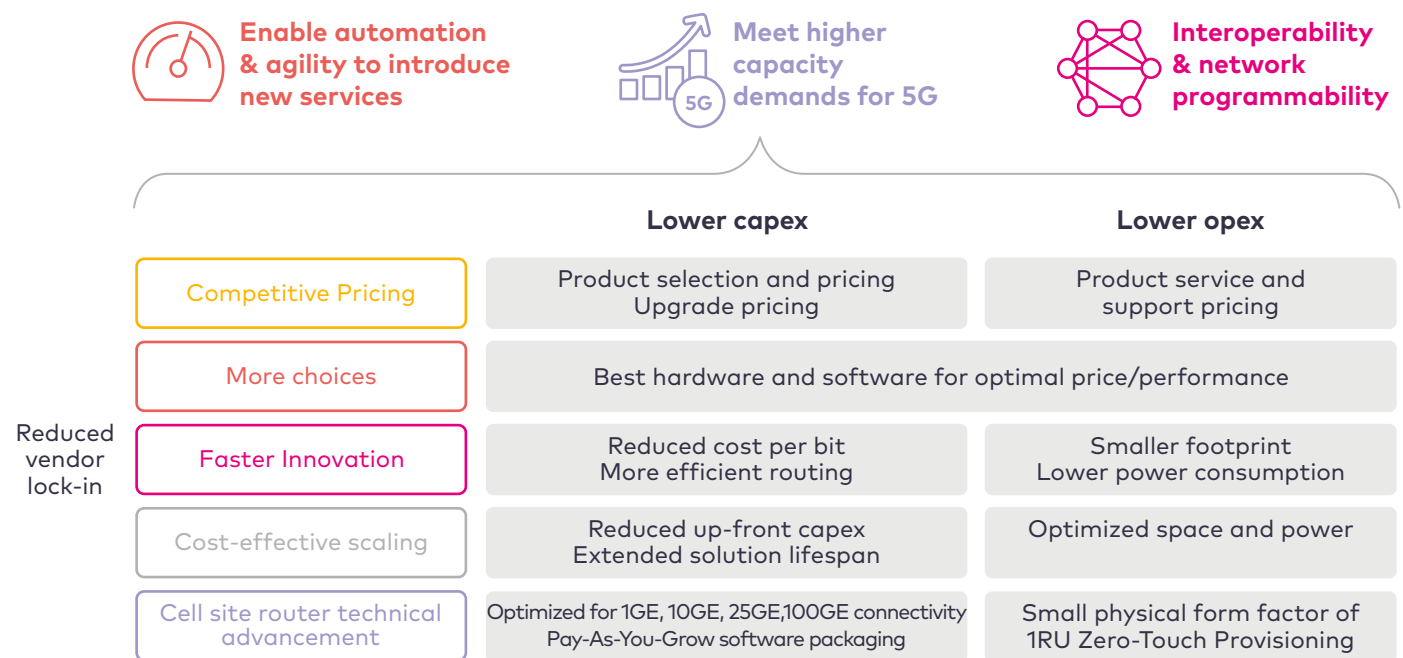Network operator

Leveraging the ecosystem
As a certified TIP system integrator, Amdocs leverages a massive ecosystem of solution vendors to accelerate and transform the way open telecom infrastructure is created, implemented and deployed.

A TIP member since 2016, Amdocs leads several workgroups in telecom infra projects, such as Open Cellular, Disaggregated Cell Site Gateway and Test Automation.

PLUGFEST

TELECOM INFRA PROJECT

Benefits

- **Reduced vendor lock-in:** By lowering barriers to entry for both hardware and software vendors, disaggregation has the potential to significantly increase price competition. Reduced vendor lock-in is also a key enabler for greater choice and faster innovation.

- **More choice:** Disaggregated routing provides an unprecedented level of choice with the flexibility to mix and match white boxes and NOSs to best match the requirements of a particular operator/use case.

- **Faster innovation:** The disaggregated router approach enables network operators to leverage innovation capabilities of the entire ecosystem, selecting best-in-class vendors and upgrading based on the innovation cycle of each component of the disaggregated solution.

- **Cost effective and flexible scaling:** disaggregated routing addresses the capacity requirements of different parts of the network, all leveraging a very limited set of individual white boxes and a common NOS.

Enable automation & agility to introduce new services

Meet higher capacity demands for 5G

Interoperability & network programmability

Reduced vendor lock-in		Lower capex	Lower opex
	Competitive Pricing	Product selection and pricing Upgrade pricing	Product service and support pricing
	More choices	Best hardware and software for optimal price/performance	
	Faster Innovation	Reduced cost per bit More efficient routing	Smaller footprint Lower power consumption
	Cost-effective scaling	Reduced up-front capex Extended solution lifespan	Optimized space and power
	Cell site router technical advancement	Optimized for 1GE, 10GE, 25GE,100GE connectivity Pay-As-You-Grow software packaging	Small physical form factor of 1RU Zero-Touch Provisioning

Why Amdocs?

In Amdocs' capacity as a member and contributor to the TIP, we support the industry's first DCSG production environments, helping transform physical networks into agile ones.

Amdocs has a proven track record supporting projects during all phases of network rollout and acceptance – including, but not limited to RAN, transport and core design, provisioning and troubleshooting services, pre/post-launch optimization, managed services, as well as support services for multivendor, multi-technology heterogeneous networks.

As a preferred partner for service providers across the globe, our vast network rollout and acceptance services provide scalable, fast and reliable network rollouts, leveraging the combination of a software-led approach, together with automation and resource flexibility – all of which supports process acceleration.

Network Equipment

We integrate and partner with innovative and disruptive companies with a mission to 'open the network'

Network Processes

We design, build, test, operate and optimize some of the world's largest and most complex networks

Network Software

We develop, invest in and deliver the industry's most open and advanced network software – from engineering tools to autonomous operations

For more information, contact Amdocs Network Marketing

www.amdocs.com

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