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August 02, 2023

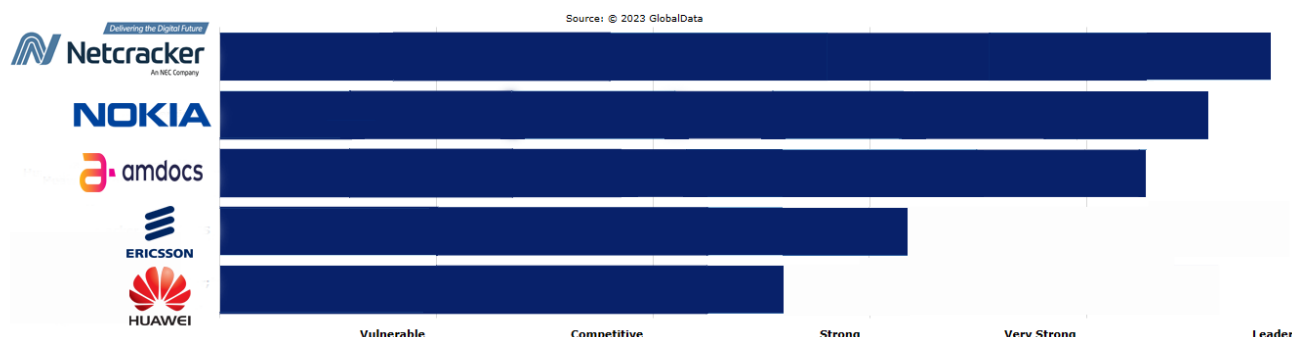
Network Service Orchestration: Competitive Landscape Assessment

Competitive Landscape Assessment - Network Service Orchestration

Report Summary:

The network service orchestration market is evolving rapidly, and some long-standing goals - including closed-loop automation, intent-based networking, hyperscale support, and low-code configuration - look increasingly realistic.

Product Class Scorecard



Market Overview

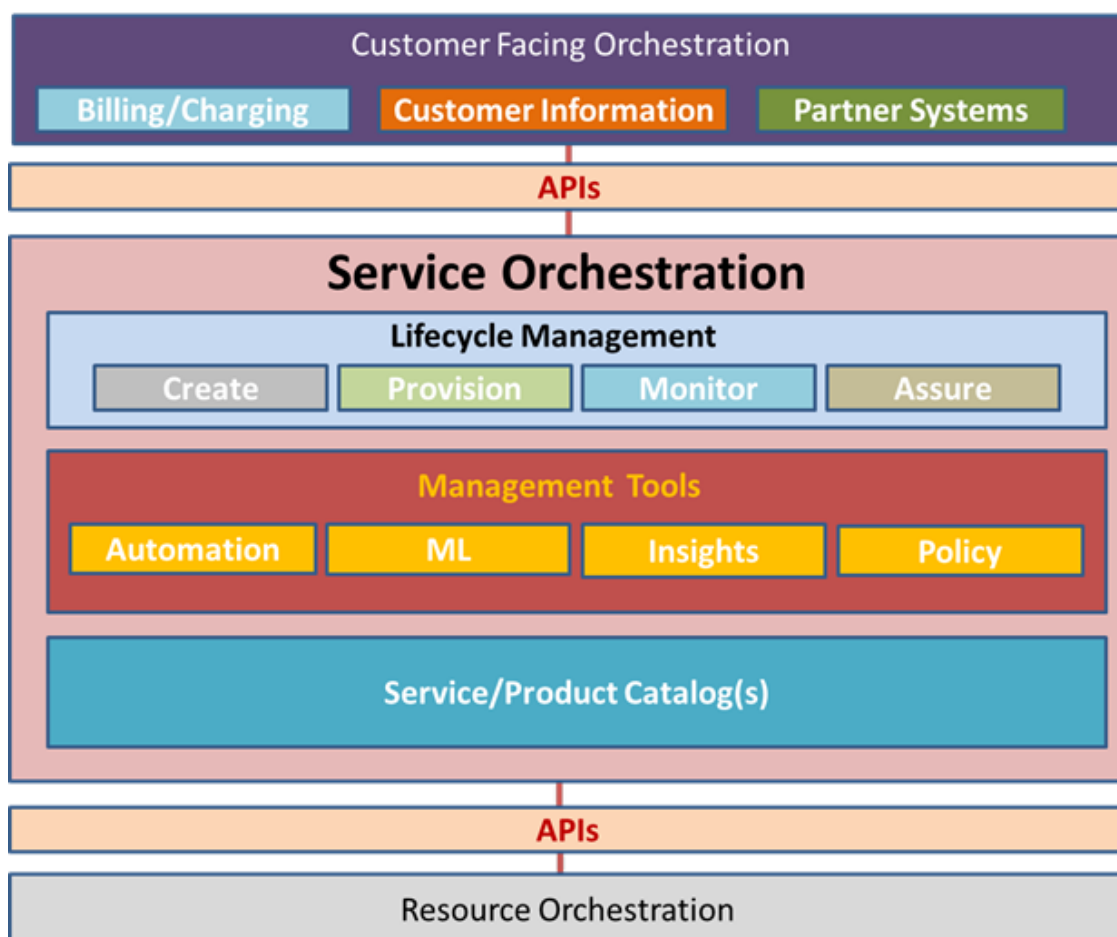
Product Class	Network Service Orchestration
Market Definition	<p>This report covers vendor products and solutions that address lifecycle management (LCM) of services that comprise virtualized, cloud-native, and sometimes physical network resources. NSO enables carriers, their partners, and their customers to design services that meet precise performance specifications, often defined in a service-level agreement (SLA) between the operator and the customer. Assuring the performance of these services within SLA specifications in an end-to-end manner is vital to NSO, as is the automation that enables closed-loop orchestration. NSO is essential for the dynamic network slicing required by standalone 5G.</p> <p>Northbound, NSO works with BSS and other customer-facing systems. Southbound, it works with the network resource orchestration layer, which coordinates domain controllers, NFVO, and other lower-level functions to allocate and manage network resources required by the service over its lifecycle.</p>

	<p>Note: GlobalData's Network Resource Orchestration report is a companion piece to this document.</p>	
<p>Rated Competitors</p>	<ul style="list-style-type: none"> • Amdocs Intelligent Networking Suite (INS) • Ericsson Service Orchestration and Assurance (ESOA) • Huawei Autonomous Driving Network (ADN) and Intelligent Operations and Management • Netcracker Digital OSS • Nokia Digital Operations Center; Nokia FlowOne 	
<p>Additional Competitors</p>	<ul style="list-style-type: none"> • Ciena • Cisco • HPE • IBM • Inmanta 	<ul style="list-style-type: none"> • Itential • DZS • Rakuten Symcloud Orchestration . • Reailize • Whale Cloud
<p>Changes Since Last Update</p>	<ul style="list-style-type: none"> • July 2023: Amdocs closed its acquisition of Teoco's assurance portfolio, strengthening an essential component of its network automation value proposition. • February 2023: Along with many carrier and vendor partners, the GSMA launched the Open Gateway initiative at Mobile World Congress. Open Gateway builds on CAMARA APIs to develop a standard, global ecosystem that enables IT developers to incorporate telecoms functionality in their applications. • November 2022: Netcracker introduced its Fiber Cloud Solution, the first of its Cloud Solutions for NetCos and ServCos. These solutions package network planning, operations, onboarding, and settlements for a particular industry use case. • December 2022: Nokia announced the deployment of orchestration center software for Telstra to build a reusable platform as a service and to drive automation and customer experience. • July 2022: Ericsson purchased communications API company Vonage. Ericsson is slowly integrating Vonage IP into the rest of its telecoms service lifecycle management capabilities. 	

Market Assessment

This competitive landscape assessment is one of two reports on orchestration in telecoms service environments. It follows the general industry consensus (though by no means unanimity) that there is a useful architectural boundary between lower-level resource orchestration and higher-level service orchestration. Network Resource Orchestration is the subject of a companion report; this report covers service orchestration.

Service orchestration encompasses the full, end-to-end lifecycle of network services made up not only of classic network functions, but of components that may come from service partners and/or are offered in public cloud environments. In addition, the rise of microservices and containers in telecoms infrastructure means that telcos must now manage multiple types of resources in their service environments: physical, virtualized (VM-based), and cloud-native. Those resources make up services that may execute on the edge, in the core, and/or in a cloud environment managed by another party.



Source: GlobalData.

While all network operators want to decrease the time and effort required to design and operate new services, 5G is bringing operators face-to-face with the need to create and manage services dynamically, and in far greater numbers than they are used to. They must be able to construct services rapidly, provision them easily, and assure and operate them reliably. Since each service will be underpinned by one or more network slices, lifecycle orchestration must extend to those slices as well.

As an architectural layer and software solution, service orchestration is still relatively new, and thus changes rapidly. Orchestration suites split and converge, product names change, and emphases shift. Standards support for this area is still in flux: there are multiple industry efforts to define the interfaces, data models, and data repositories that enable the necessary zero-touch lifecycle orchestration and communication with other management layers.

In particular, TM Forum's APIs have largely become the standard for northbound integration with the monetization/customer information layer; the southbound interfaces to the resource orchestration functions, however, are much less settled. ETSI's and MEF's architectures are also being used in production today, sometimes in relation to specific use cases. MEF LSO, for example, is often used in fixed line networks.

Since our last report, the industry has increasingly agreed that success will require closed-loop automation, intent-based orchestration, and web developer-focused network exposure. These priorities have generated early progress in real-time catalogs, inventories, and topologies; real-time assurance; and another layer of API exposure aimed at easing the consumption of telecoms functions by the broader IT ecosystem: the Open Gateway initiative, which in turn is based on the CAMARA Project.

As could be expected from a new software architecture, many deployments are limited to a single network domain - with transport appearing especially often initially - and therefore also often a single infrastructure vendor. This can make it difficult to determine whether a vendor offers a truly resource-agnostic service orchestration layer, or whether it merely provides a full-stack silo for a particular domain. Similarly, some deployments support a single service (e.g., VoLTE) across more than one network domain. To be evaluated in this report, a vendor must show that its solution credibly handles service orchestration across multiple technology domains.

The rapid development of capabilities in this arena suggests that competition will remain intense for the next few years, and that any vendor evaluated in this report could be the best vendor for a given carrier's particular set of circumstances. We also expect that the 'leader' ranking will shift from update to update as technology matures.

Market Drivers

- **Little Architectural Consensus:** While the ONAP model associated with network function virtualization has largely given way to cloud-native approaches, there is little agreement beyond that. In addition to varying APIs between different layers of the stack - especially between the service and resource layers -- vendors and carriers are exploring myriad alternatives in reference architectures, data models, data abstraction, and catalog convergence.
- **Hybrid Resources:** Not only must a service orchestration solution be able to manage virtual, cloud-native, and ideally physical functions, it should also be able to orchestrate resources from across the operator's infrastructure as well as partner resources, including those from public clouds.
- **Automation and Assurance:** Any service orchestration solution must use automation to handle service creation and orchestration demands, the complexity of which far exceeds the capabilities of traditional manual processes. Automation is therefore essential throughout the solution, especially in the assurance function.
- **Model- and Intent-Driven Orchestration:** Traditional rules-based orchestration is inadequate to the demands of an infrastructure that must spin up slices and services on the fly, add and subtract resources, and move workloads around the network for the best experience. Service orchestration must therefore drive these functions with service models, intent, and/or experience inputs.
- **End-to-End Visibility and Analytics:** To support this automation, any service orchestration solution must be able to monitor service performance in real time, and ideally track/report on service experience. Moreover, this monitoring should be on a per-user, per-service, per-device basis. This sophistication and granularity requires not only advanced data gathering and data models, but artificial intelligence as well.
- **Deployment Diversity:** Some early service orchestration projects are parts of large, complex, and professional services-heavy transformation engagements. While some operators require that kind of work, others are looking a more packaged, plug-and-play solution. Both models are necessary; neither will meet all of the market's needs.

Buying Criteria

- **Solution Components:** This category judges the breadth of a vendor's solution as if it were to be deployed as a single-vendor, best-of-suite silo. Partner components are included if they are integrated with the vendor's stack and offered as a single solution. It includes catalogs, data abstraction layers, data models, model-driven and intent-driven capabilities, assurance, analytics security, hybrid cloud management, and partner ecosystems.
- **Integration and Interworking:** This category evaluates the solution's ability to work with the diverse third-party products that make up a typical carrier network. It covers northbound and southbound functions like policy control, monetization, and resource orchestration, but also assurance and analytics capabilities provided by other vendors.

- **Standards and Interface Support:** Industry-standard architectures, interfaces, modelling languages, and so on are essential for smooth operation and to avoid vendor lock-in. Since the industry has yet to reach a consensus in many of these areas, this section evaluates support for standards from the TM Forum, MEF, ETSI, 3GPP, and other industry consortia.
- **Lifecycle Management:** This category evaluates the solution's ability to ease and automate the full lifecycle of the service, from design and testing to assurance. It also includes intent-driven orchestration, smart workload placement, and increasingly, low- and no-code capabilities.
- **Production Experience:** Since solutions mature by evolving to meet real-world conditions, this category evaluates customer numbers, PoCs/trials, a vendor's largest and most complex deployments, as well as the breadth of supported services and partner/third party resources.

Vendor Recommendations

- **Cross-Domain Boundaries:** While most vendors have built up orchestration credentials in a few network domains, all should strive to extend their expertise to adjacent domains in the race for full end-to-end service orchestration experience. One way to do this quickly is to use successful work in one domain to convince the telco to award top-level orchestration to your when new domains and domain orchestrators are added.
- **Stand and Deliver 3GPP RAN:** Open RAN, virtual RAN, and similar disaggregation efforts will revolutionize the industry, eventually. But vendors that wait for widespread adoption of these new approaches before supporting wireless service orchestration may miss the boat. Standard 3GPP RAN is mature and has a mighty install base; supporting it is the key to 5G and many edge-related orchestration RFPs.
- **Tell a Monetization Story:** While most architecture diagrams place the monetization layer above the service orchestration layer, it is the latter's ability not only to automate service/slice operations, but to support quick and easy service creation that will enable operators to produce high-margin services. Vendors should therefore be able to provide specifics about how their orchestration supports service agility.

Buyer Recommendations

- **Choose Your Openness:** This network transformation generation represents telcos' last, best chance to avoid vendor lock-in in their service infrastructure. While some operators will begin with a single-vendor orchestration deployment - after all, they have to start somewhere - operators should ensure that the vendor's interfaces and architecture match their evolution strategy, especially regarding interfaces with lower-level functions where there are still competing approaches.
- **Require Hyperscaler Support:** While the integration of public clouds and telco networks is still largely in the laboratory stage, the eventual need to integrate SaaS workloads and cloud domains is inevitable. Build that likelihood into your RFPs.

- **Press Vendors on Intent:** Intent-based orchestration appears on marketing slides more than it does in production networks. Buyers should determine how each vendor's architecture defines, stores, and implements business intent, and should satisfy themselves that their vendor's scheme will work with other vendor components to the north and south of the service orchestration layer.

Netcracker Product Profile

Product Name	Netcracker Digital OSS
Current Perspective	<p>Netcracker Digital OSS - part of Netcracker Digital Platform - is fully microservice-based; these microservices can be decoupled and configured for each deployment to match a customer's environment and requirements. Oriented toward end-to-end automation of network slices and services, Netcracker supports a broad range of APIs and standards bodies.</p> <p>Netcracker bolsters its solution with self-service portal capabilities, domain orchestrator experience across several network areas, out-of-the box service definitions for many different enterprise services, a full OSS/BSS suite, and an enterprise services ecosystem.</p>
Buying Criteria Rating	<p>Integration and Interworking Leader</p> <p>Lifecycle Management Leader</p> <p>Production Experience Leader</p> <p>Solution Components Leader</p> <p>Standards and Interface Support Very Strong</p>
Product Scores	Leader
Strengths	<ul style="list-style-type: none"> • Netcracker boasts among the most extensive deployments of single- and cross-domain service orchestration. • Netcracker's solution already runs in production on several major public clouds.

	<ul style="list-style-type: none"> • Netcracker has surrounded its offering with a full suite of ecosystem partners and preconfigured service templates. • Netcracker's organically developed, unified code base avoids many of the deployment and speed problems associated with M&A-driven code diversity.
Limitations	<ul style="list-style-type: none"> • Netcracker occupies the middle of the pack when it comes to private/dedicated network support. • While Netcracker has a good mix of customer and project sizes as well as both brownfield and greenfield expertise, it has fewer of the largest network transformation deals than some competitors.

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