# Orchestration is likely to be the biggest challenge to network slicing deployments

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Network slicing has emerged as a key use case enabled by 5G standalone. It will allow communications service providers (CSPs) to create dedicated network slices that meet pre-determined specifications in terms of characteristics such as quality of service (QoS), latency and bandwidth. However, network slicing deployments are highly complicated because they require advanced orchestration solutions that can work in multi-domain and multi-vendor environments, as well as zero-touch automation solutions that can help to create, deploy and manage slices at scale. This article is based on Analysys Mason's report, *Implications of network slicing for the network automation and orchestration sector*.

## CSPs must decide which of the two main slicing approaches to take

Vendors' current approaches to the orchestration of network slices can be split into two categories: proprietary, end-to-end orchestrator-based approaches and open-RAN-based approaches that communicate radio resource management through a slicing-enabled RAN intelligent controller (RIC). Vendors' solutions are still very much in the developmental phase and there are few proof-of-concept deployments because requirements and standards are still being created. Network slicing also relies on the deployment of a full 5G standalone core, which has not yet been commercially deployed anywhere.

- **End-to-end approaches.** Many vendors are developing end-to-end network orchestration solutions that enable the zero-touch lifecycle management of network slices at scale. Some of these solutions incorporate slice template catalogues that can be used to increase the speed at which slices can be deployed for common use cases. For example, Amdocs uses its own templates to ensure the reusability of slices, while Ciena Blue Planet uses templates defined by the GSMA. Most vendors link their network automation and orchestration (NAO) layers to a service management and orchestration (SMO) solution in order to orchestrate slice lifecycle management.

- **Open-RAN-based approaches.** Some vendors are using open-RAN deployments to enable network slicing. They give their RICs slicing capabilities, thereby enabling xApps to perform dynamic capacity allocation in near-real time. This approach is more open than the end-to-end alternative, but is likely to be riskier in the near-term because CSPs will have to manage many different components from multiple vendors.

## Network slice orchestration is extremely complex, so orchestrators must be highly automated

Orchestration is likely to be the biggest challenge to the successful deployment of network slicing. Vendors must therefore demonstrate that their orchestration solutions can enable a viable business model for network slicing. Orchestrators must provide a high degree of automation and zero-touch management throughout all

phases of the network slice lifecycle because manually instantiating and running each network slice is inefficient and costly. This is complicated because orchestrators must manage the underlying network resources, which may be from multiple vendors. End-to-end orchestrators that cover the core, transport and RAN domains are likely to be a good option. However, vendors may also take an open-RAN approach, whereby xApps that are deployed in the real-time layer must automatically reprovision network resources to prevent SLA breaches identified by the rApps. This approach is riskier because it is more complex than the end-to-end alternative and managing 5G standalone is challenging, particularly in multi-vendor environments.

## CSPs should carefully select their network slicing orchestrators to ensure success

CSPs should look to minimise additional complexity to ensure the success of their network slicing deployments. They should initially opt for proprietary, end-to-end orchestrators, where possible, rather than open-RAN-based deployments. CSPs that do take an open-RAN-based slicing approach should initially deploy their slices in the parts of the network with the lowest traffic levels to ensure success. They may also pursue dual deployments (open RAN alongside the existing network) for less-stressed network elements so that they are able to offer early network slicing services with minimal risk.