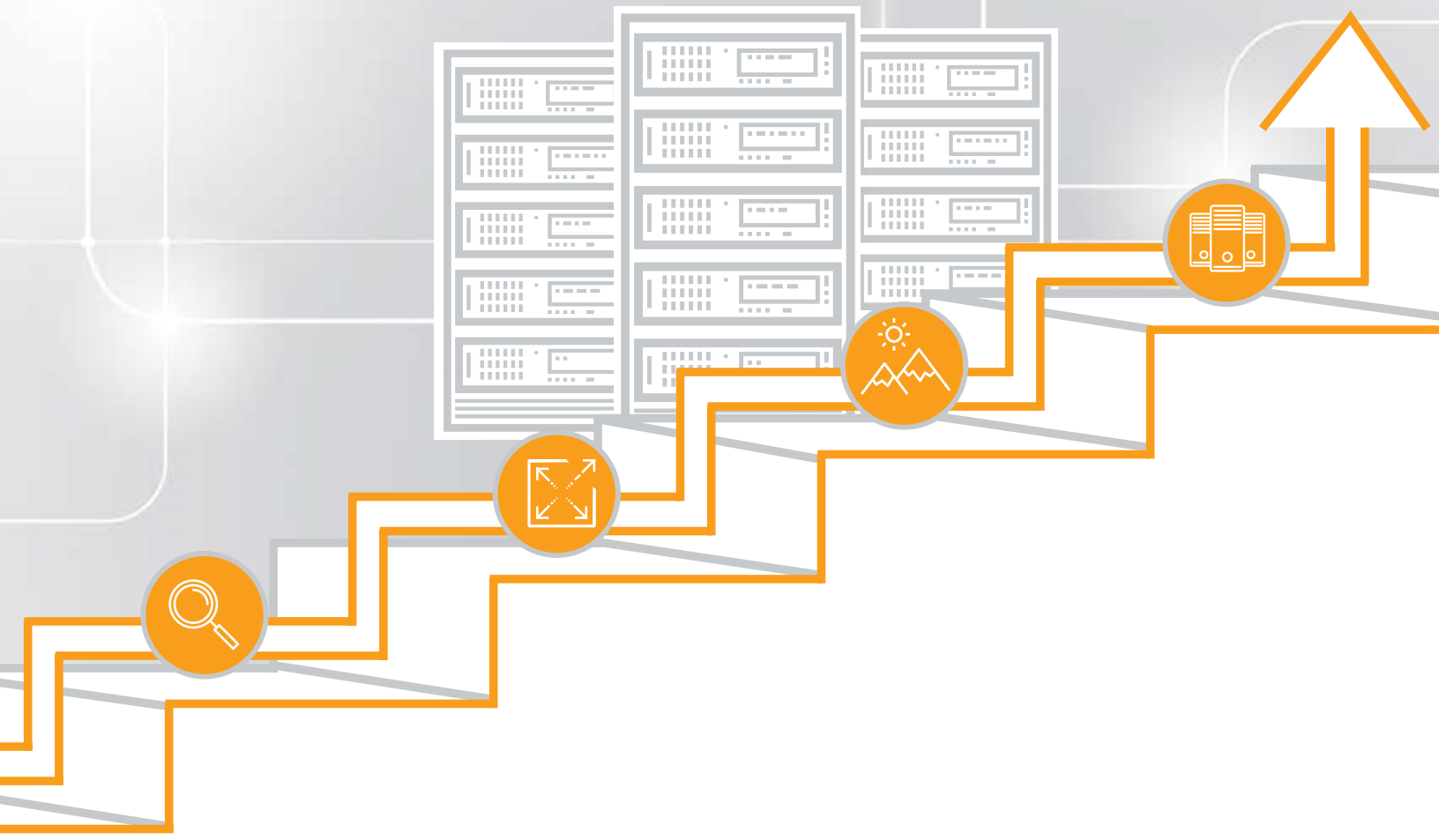
EXECUTIVE BRIEF

DOCSIS® 3.1 MIGRATION:

Four Important Steps to Successful Evolution



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DOCSIS® 3.1 Migration: Four Important Steps to Successful Evolution

When it comes to DOCSIS® 3.1 evolution, mapping out a path to success can be a challenge. This is because the journey to DOCSIS 3.1 is unique for every Service Provider. Each has its own architecture, budget constraints, service mix, schedule and legacy solutions with which to contend. But by beginning with four core steps, Service Providers can forge a successful path to DOCSIS 3.1 that makes the most of their existing infrastructure and sets them up for years of service growth. These steps include assessing the network, maximizing inside plant space, increasing existing hardware capacity and optimizing outside plant operations.

Assessing network readiness

Before executing a DOCSIS 3.1 migration, it is critical to first conduct a thorough evaluation of existing infrastructure and operational systems. This helps identify where the network is ready to capitalize on DOCSIS 3.1 – and where it is not. For the areas where upgrades are needed, an assessment can also help Service Providers pinpoint exactly what improvements need to be made to hardware and software, as well as any configuration updates that are required.

Common areas of assessment include:

- **CMTS capabilities** – Can the CMTS be upgraded to support DOCSIS 3.1?
- **Core to edge routing capabilities** – Are sufficient ports and capacity available? Is system software up-to-date?
- **Operations support system (OSS) and business support system (BSS)** – Can back-office and customer-facing systems support DOCSIS 3.1 service levels?
- **Inside plant** – Are components in the RF path of the inside plant ready for DOCSIS 3.1? Are power levels, attenuation levels and input/output levels sufficient? Are there any physical obstructions for new cable installation and is rack space sufficient?
- **Outside plant** – Is the HFC infrastructure from the fiber node to the homes passed in the RF path capable of supporting the basic DOCSIS 3.1 configuration of 1 GHz+ forward spectrum and 85 MHz+ return spectrum?

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Once a network has been assessed for DOCSIS 3.1 readiness, a road map to providing higher capacity on the access network and even Gigabit speeds in the home begins to take shape.

Maximizing inside plant space

The next core objective in a DOCSIS 3.1 migration is to ensure that headend and hub facilities offer the physical space to accommodate any additional infrastructure that may be required. One common misconception is that new floor space or expanded facilities are always needed when moving to DOCSIS 3.1. But Service Providers can often avoid expanding their footprint through an initiative known as high-density hub evolution. ARRIS has pioneered the Planned Offsite and Delivered (POD) methodology to help Service Providers evolve their inside plant architecture in just this way.

The POD methodology begins with planning and design at the Service Provider's location, where DOCSIS 3.1 can be factored into the roadmap for evolution. Next, the evolved hub infrastructure is constructed in an offsite facility, which allows existing operations to continue uninterrupted. While still offsite, the system is fully staged, wired and tested under simulated real-life conditions to ensure that it is fully ready for installation. Only then is the new hub infrastructure brought onsite and online. By leveraging a POD-based approach to hub evolution, Service Providers are able to improve system density significantly, while preparing the inside plant for DOCSIS 3.1.

Optimizing outside plant operations

In addition to evolving the inside plant for DOCSIS 3.1, it's important to create a plan for the outside plant that sets it up for enhanced capacity, improved reliability and future growth. When considering changes to the outside plant, there are several factors that play a role beyond the adoption of DOCSIS 3.1.

Common factors that require consideration follow:

- **Bandwidth capacity demands** – Are your subscribers' bandwidth requirements in line with Nielsen's Law, or is additional capacity modeling required? Can Service Groups or users be segmented based on their capacity requirements?
- **Node capabilities** – Have you deployed next-generation 1.2GHz nodes to enable greater bandwidth capacity upstream and downstream? If not, is now the time to do so?

- **New Distributed Access Architectures (DAA)** – Are you considering a move to DAA? If so, have you already upgraded existing nodes? Are you ready to add nodes to your outside plant facilities?
- **Aging infrastructure** – When was the last significant technology update of your outside plant? Is aging equipment producing high failure rates in the field and leading to an increase in costly truck rolls?

By studying these factors, Service Providers can make decisions on a Service Group by Service Group basis to ensure that the outside plant is fully ready to meet increasing bandwidth demands. In addition, by proactively optimizing the outside plant, Service Providers can minimize the technology disruptions that often impede their efforts to migrate to DOCSIS 3.1.

Increasing Service Group capacity on the CCAP platform

The final stage on the journey to DOCSIS 3.1, is to take a look at the critical delivery point for broadband: the CCAP platform itself. This is where Service Group capacity comes into play, and where cost-effective evolution is a high priority. To help determine how ready a CCAP platform is for DOCSIS 3.1, consider the key factors below:

- **Software upgradability** – Can the CCAP platform be upgraded to DOCSIS 3.1 via software?
- **Legacy support** – Can the CCAP platform make both DOCSIS 3.0 and DOCSIS 3.1 available to all Service Groups. How will the broadband experience vary between subscribers with DOCSIS 3.1 and DOCSIS 3.0 modems or gateways?
- **Service Group capacity** – How many new service groups and how much additional bandwidth can be added when the CCAP's hardware modules are upgraded?

The CCAP platform is the workhorse of broadband delivery, so before a Service Provider migrates to DOCSIS 3.1 it is important to verify that it is up to the task. That is why it is so important to validate that the CCAP platform is capable of supporting the subscribers, Service Groups, bandwidth consumption levels and overall quality of experience that current and future conditions require.

Conclusion

The goal of all DOCSIS 3.1 migrations is to ensure service continuity, maximize bandwidth gains and minimize costs. While there is no one correct path for a DOCSIS 3.1 migration, the steps listed above can help you find your own path to success.

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