



A successful HTS service – more than the modems and transmission

The advent of high throughput satellites (HTS) has seen significant amounts of new satellite capacity come online in recent years, prompting industry-wide disruptive innovation. This lower-cost capacity enables a new era of satellite communications, with innovative new applications spreading around the world. However, there are a number of factors that must be considered for the operation of a successful HTS service; here, Dave Rehbehn, Vice President, International Division, at Hughes Network Systems, describes the core aspects.

The satellite industry is undergoing a dramatic evolution as more and more high throughput satellite (HTS) capacity is introduced to markets around the world. HTS is bringing more and lower-cost capacity that enables the satellite industry to cost-effectively provide large-scale internet services to rural and other hard-to-serve areas around the world.

To enable these services, many providers are focusing on selecting the optimal ground system, and rightly so, because the ground system is a key element in delivering the lowest possible cost per bit. The DVB-S2X standard, with five percent roll off and more modulation/coding points, together with wideband carriers, are some of the technologies at the top of many service providers' minds. But the ground or VSAT system is only one element, albeit important, for a successful broadband service.

There are a number of crucial systems beyond the ground system that are key to a successful broadband service. One of the most important are the Operational Support System (OSS) and Business Support System (BSS). These are systems that enable an operator to automate critical operational and business processes so that a broadband service can cost-effectively scale to support many subscribers. Figure 1 illustrates the various functions of the OSS/BSS and their relationships to the network and customers.

Many of the OSS functions are often implemented as part of the VSAT network management system (NMS). But the BSS in particular is customized for each service provider, as it must take into account the unique business rules and processes developed by the providers for their markets.

Selecting and integrating the right OSS and BSS systems, then, is as essential to providing successful HTS service as the satellite and ground control systems. To get a sense of their critical nature, we'll review some of the functions that



rely on OSS/BSS integration and the effect they have on service delivery.

From the beginning: order management

New customers must be brought online as quickly as possible. This requires several steps that the BSS system facilitates:

- Input of customer information, credit check, plan options;
- Lookup of capacity availability and ability to provision;
- Entry of selected plan and options, collection of initial payment if needed;
- Equipment order entry; and
- Scheduling of installs.

The BSS system pulls information required to complete these tasks from its various internal databases, as well as from the OSS system.

Service fulfillment

Once an order has been placed, the process of creating the service and bringing the customer online begins. This process may be automated in more sophisticated systems, or portions may be manually handled while others are automated. The steps in fulfilling an order are:

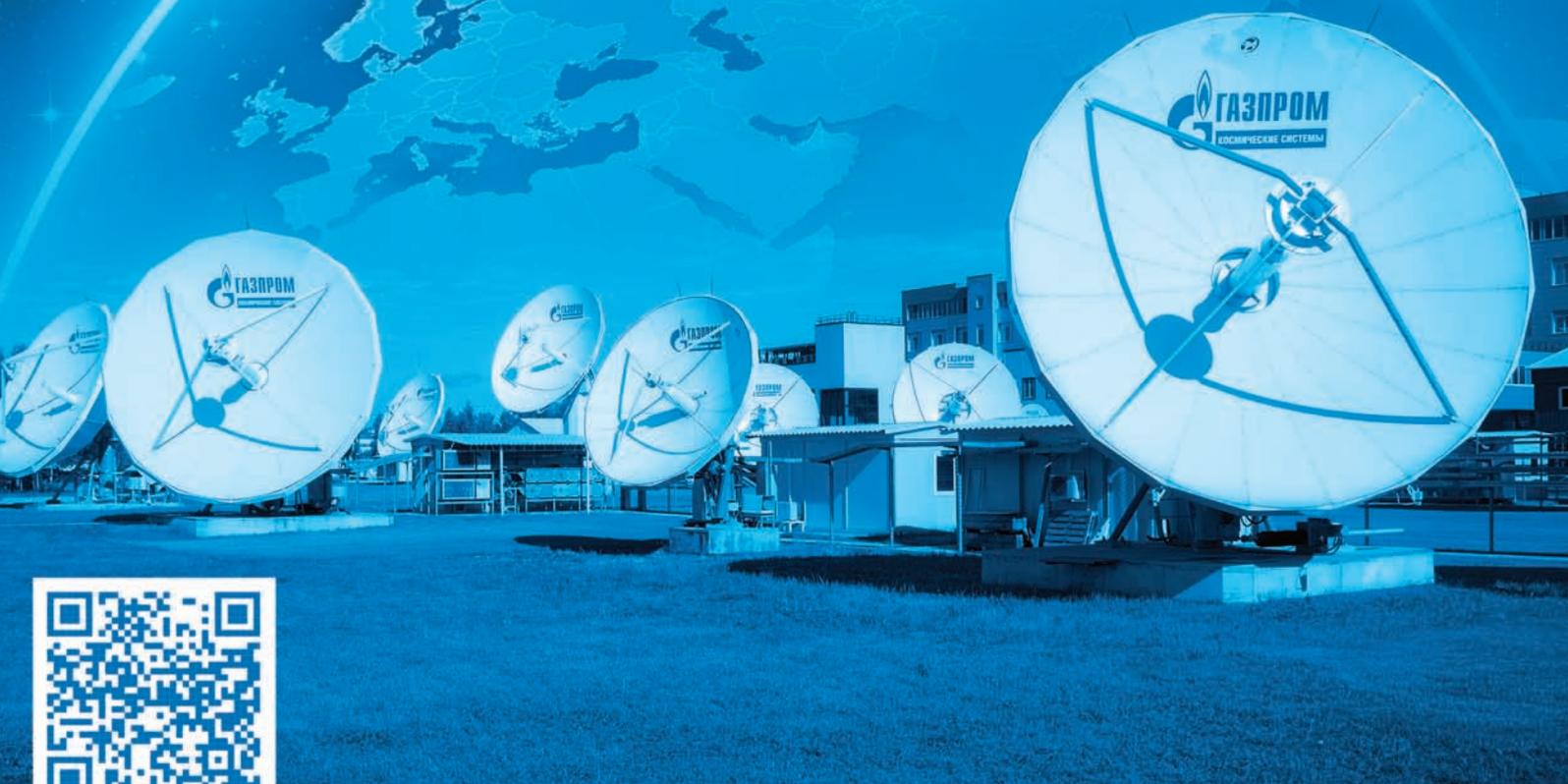
- Order management: breakdown of the order into the constituent parts as they relate to the network;
- Inventory and delivery: defining the required equipment and delivering it to the customer;
- Provisioning: creating the necessary CPE configuration, circuits, tunnels, etc., in the network components;

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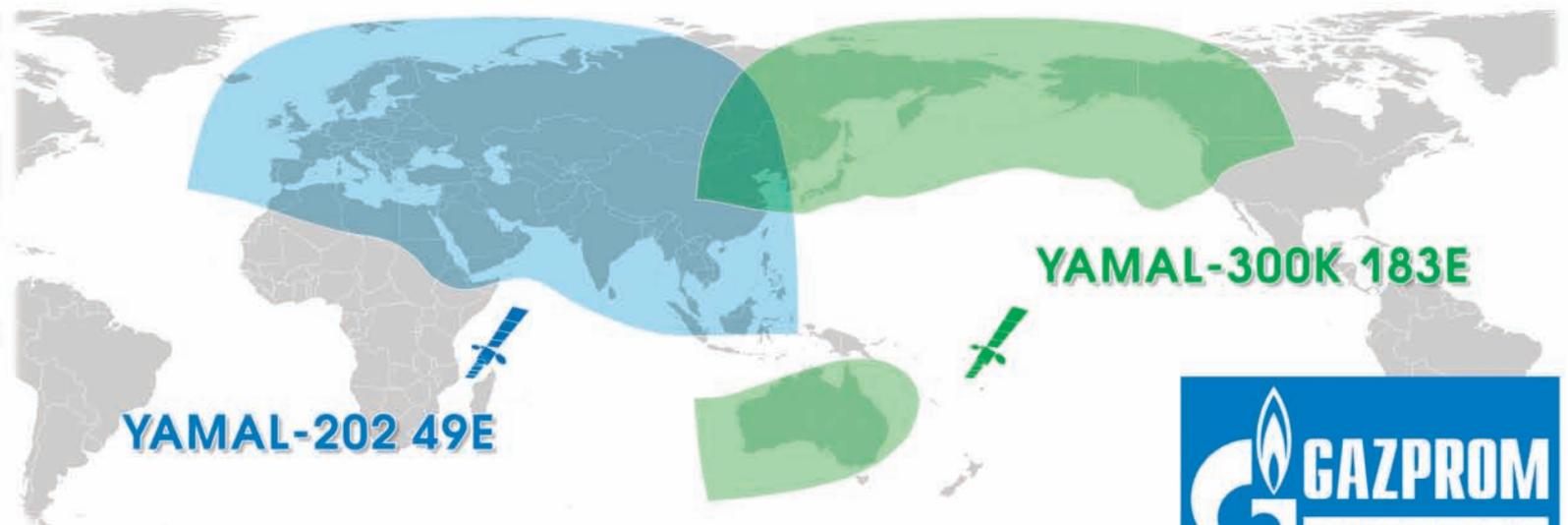
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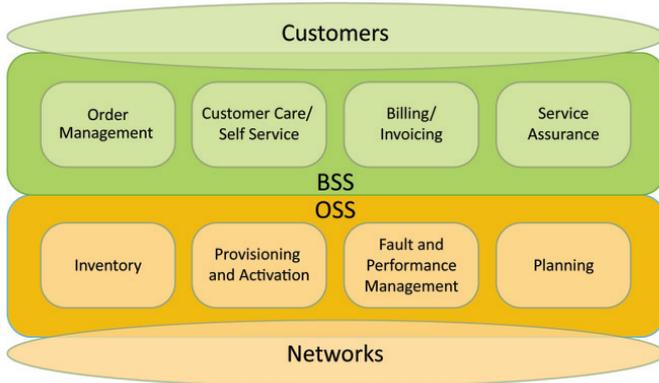


Figure 1: The various functions of the OSS/BSS and their relationships to the network and customers. OSS and BSS functions complement each other to enable a broad array of service options. Their integration forms a link between customer needs and network operations.

- Install and service activation: enabling the service once the install has been completed; and
- Service verification and quality assurance.

The final step above includes the comparison of the installed site to adjacent sites in order to verify that the signal levels are within expected norms.

Billing

Once a service is activated and the customer is using it, the process of billing is initiated. This process may be largely automated in the BSS system to occur, typically, on a monthly cycle. However, the BSS billing components may rely on data from the OSS systems to apply credits caused by outages, for example. For enterprise customers especially, the Service Level Agreement (SLA) is an important contract deliverable that must be met by the service provider, and therefore tracked and reported.

Self care

For some issues that do not involve a direct service outage, customers can use self-care portals. These allow users to resolve questions quickly on subjects such as account status, billing and network status. If a customer is experiencing issues, they may also open and track cases through the self-care portal. All of the information that the customer can see on the self-care portal is presented from the OSS/BSS.

Customer facing support

Depending upon customers' SLAs, various levels of live help desk and onsite support may be required. These help desk and support personnel require interactions in one form or another with the BSS and OSS systems in order to verify accounts, open trouble tickets, and conduct other activities. The OSS/BSS facilitates customer and network support at every level.

Outsource, build or integrate with existing OSS/BSS

The cost and time required to implement an effective OSS/BSS system can be very significant. In general, there are three options for implementing such systems:

- **Building a solution from the ground up.** This entails purchasing and integrating the necessary components.

It may also include writing custom applications. Building a custom solution may require hiring a large number of developers and support staff to design the software and hardware systems.

- **Bringing in an 'off-the-shelf' solution from a large integrator.** While there are various options for off-the-shelf OSS/BSS systems, these typically come at a very high price and still require a significant amount of customization to automate processes that are unique to each business.
- **Utilizing cloud-based services offered by an experienced network operator.** This option may also entail some amount of customization in order to support each provider's unique business process requirements. However, it eliminates the need for staff to support the software and physical infrastructures, which the first two options require.

Key to all of these options is an extensive and well-defined set of application programming interfaces (APIs), to the VSAT NMS.

These APIs should enable virtually any function that is performed by an operator at the NMS interface to be done via a programmatic or electronic interface. A good NMS API will enable a quick and efficient interface of an OSS/BSS into the VSAT broadband system.

Distinct roles, common goals

Though OSS and BSS systems serve distinct roles in the overall management of the network, it is essential that they are fully integrated for maximum effectiveness. OSS/BSS systems comprise a variety of software systems, which bridge business services and network operations.

For example, if a customer calls about a problem with their service, the call center will likely use a database in the BSS system to look up and validate the user. Once validated, the call center technician may use data such as equipment alarms from the OSS to determine the cause of the customer's problem. Therefore, although there is a clear distinction between the BSS and OSS systems, they essentially form a circular relationship as illustrated in Figure 2.

A successful service operation requires a robust and extensive OSS/BSS so that the myriad tasks associated with operating and managing a broadband service can be done as efficiently as possible to ensure high customer satisfaction levels. ■

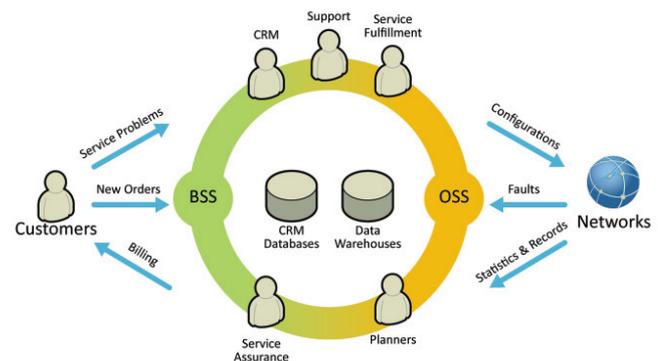


Figure 2: BSS and OSS systems form a circular relationship from customers to the network that enables HTS providers to offer responsive and effective service.