Preintegrated Network Devices and Operations Support Systems Cut "Integration Tax," Deliver Services Faster

Executive Summary

You probably understand only too well the pain points of introducing new services and the length of time it can take to bring them to market. The complexity of quickly getting network elements and operations support systems to communicate effectively when you develop and deliver these services exacts a cost—a cost called the "integration tax." Cisco and Amdocs are giving you a tax break by taking a fresh look at preintegration, evolving the relationship and mode of operation between hardware and software vendor.

If you can adopt new technologies and provision new services efficiently, you can respond to market demands promptly. The Cisco-Amdocs objective is to achieve this while actually lowering costs through the full lifecycle. This paper will present typical use cases illustrating how the Cisco-Amdocs-led initiatives give you both agility and savings.

The "Integration Tax"

Operating a communications network and remaining competitive keep getting tougher. You need to give customers the services they want at prices they will accept. Affordable services depend on your ability to pare down costs, while attractive services depend on your ability to keep your network agile, flexible, and capable of supporting new demands.

Cisco and Amdocs hear constantly from service providers (SPs) that they need to:

- Assemble new and often complex service offerings, especially those that cross domains; examples include a domain that links an Ethernet local area network to a cloud-based data center, or one that combines mobility with video. Ideally, an SP could pick and choose from multiple elements in the network and fit them together easily to create new service offerings.

- Update the operations support systems (OSS) suite quickly to monetize new devices, introduce new competitive offerings that employ new technologies quickly, and thus profit from those technologies.

- Run the network more efficiently and cost-effectively.

One factor in all of these needs is the relationship between network devices, the network management layer (NML), and OSSs. The three groups of products may offer or require dissimilar descriptions of their resources and dissimilar northbound or southbound interfaces. These differences need to be reconciled before network elements and systems and OSSs can work together seamlessly. In addition the OSS needs mechanisms for quickly acquiring and aligning new device models in its inventory and incorporating these models into existing and new processes and functionality.

Too often that requires engineers and technicians devoting too many hours to getting a given device and a given OSS to interwork satisfactorily. This is especially true with services that involve more than one domain. Too often, the introduction of new hardware must wait until the OSS fulfillment processes are fully integrated with it. Multiply that by many devices and operations support systems and the time required begins to add up to a far from trivial cost—the "integration tax," which is paid far too often.

The Cisco-Amdocs Solution

Cisco and Amdocs have already preintegrated many of their products and are continuing the process. Cisco® network devices and NML systems and Amdocs OSS meet each other through a common, well-defined interface. In addition, the two companies have developed a paradigm for how information about new hardware flows proactively from Cisco to Amdocs. Moreover, the solution provides for event-aware data integrity management and enhanced resource selection. You, as a provider, don't have to make Cisco network devices and NML systems and Amdocs OSS work together—they do so out of the box.

The solution reduces:

- Services effort associated with the design and build of new Cisco device models in the OSS-maintained network inventory

- Time needed to integrate new Cisco hardware into the network fully, including existing processes and functionality

- Costs associated with maintaining interfaces to Cisco domain managers

- Effort associated with integration updates required by OSS for new hardware

The solution also helps make your network compatible with future versions. New and existing systems communicate according to the same protocol.

Overall, this solution provides lifecycle management of network elements and systems so as to utilize the full value of an underlying multitechnology, multivendor network. Several parts of the solution make use of the Product and Service Assembly (PSA) open standard (created in the TM Forum context—TMF287) for information interchange; this enables other vendors to join this effort. Using the PSA standard, the solution discovers and catalogs resource-facing capabilities from participating technology domains and individual products. In addition, a PSA integration gateway allows any existing application programming interface (API) to be converted to be PSA compatible.

Figure 1 shows the architecture for a network made up of Cisco network elements and NML systems and the Amdocs OSS suite. The cooperative work lies between the Cisco network element and network management layers and the Amdocs OSS suite. If other device vendors adhere to the PSA standard for their interfaces, they can also make use of the same preintegration with Amdocs OSS.

Figure 1: Cisco Network Devices and Systems and Amdocs OSS Suite
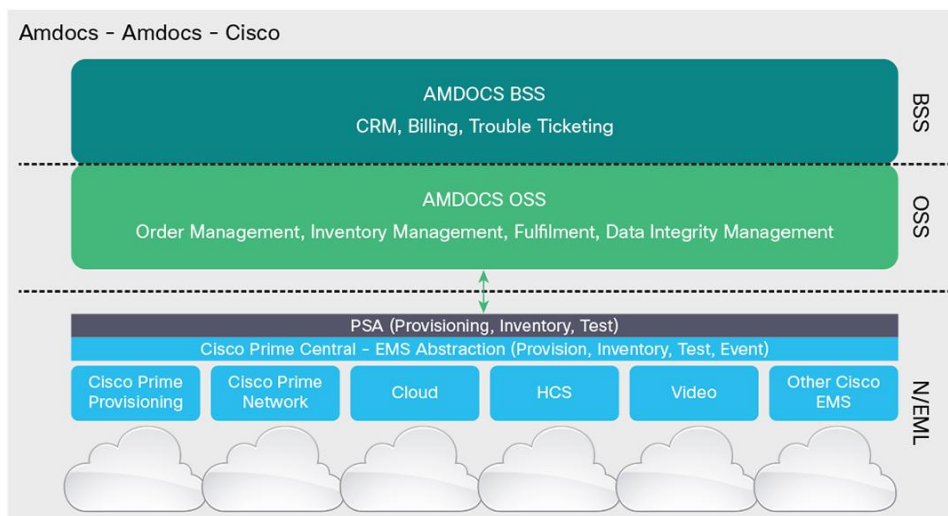
The solution consists of four initiatives:

- New hardware information flow

- Single PSA interface across all Cisco domains

- Event-aware data integrity management

- Enhanced resource selection

New Hardware Information Flow

Cisco and Amdocs have defined a mechanism by which information about Cisco network devices and systems is consumed by the Amdocs OSS suite. The description of the new device or system is in machine-readable form to facilitate mechanized model generation. With a new router, for example, the OSS suite will automatically receive information describing its data points, the number of card slots and what cards they can accept—everything the OSS needs to incorporate the router into the network, employ it, and maintain it. Your OSS will read that information and load it automatically, quickly creating models for new network devices and systems.

The OSS models for new hardware will be readily available to the SP's OSS, since data about them will be shared from the hardware launch date, further shortening the interval before new technology can contribute to profits. The format for this data exchange is published and nonproprietary and as such is open for other vendors to adopt.

Single PSA Interface across All Cisco Domains

The PSA standard enables SPs to conceive, create, assemble, and launch new products more rapidly and more efficiently than they can now. An interface conforming to the standard will convey messages regarding:

- Services available from the device's or system's catalog

- Transactions that can be performed on each service

- Data required to initiate the transactions

- Events published as part of a transaction, and other information

The interface also insulates northbound interfaces by abstracting changes in Cisco network management systems.

Devices that conform to this standard, developed with input from multiple vendors, can reliably be used together, so SPs can mix and match network elements as new services require them. If the other vendors adopt PSA, their devices can also interface with the Amdocs OSS suite as Cisco devices do. Cisco has applied the PSA standard to devices and systems from all network domains such as Multiprotocol Label Switching (MPLS), Ethernet, data centers, cloud services, video, mobility, and security. This simplifies creating a new service offering that involves multiple domains, as devices in those domains all present machine-readable catalog information that conforms to the PSA standard.

Amdocs has similarly applied the PSA format to the southbound interface of its OSS suite, so it can readily engage with the northbound interfaces on the Cisco systems. Amdocs will provide PSA-aligned interfaces for resource activation and data integrity management.

Event-Aware Data Integrity Management

Data integrity management processes such as discovery, synchronization, and reconciliation can be driven by schedules or by changes in network inventory. The PSA-based interface to network elements from all domains facilitates these processes. When a network event such as the addition of a new network device or change in capacity of an existing one is registered, the Amdocs OSS automatically pulls its data and disseminates it across the Amdocs OSS suite as needed.

Enhanced Resource Selection

When the OSS has access to all the relevant information available from network devices and systems, it can much more easily and accurately select network devices and systems to deploy in a new service offering or support an existing one. For example, a selection process could identify which routers have both the capability and the available capacity to handle a certain type of signal.

Through the PSA interface the OSS will have access to the functional capability of a device—what it can actually do as defined by hardware and software, licensing, and its role in the network—even as this changes dynamically. The OSS will be able to discover and update this information from the network, using it for decision-making processes.

Integration in Action

Providers will benefit from the Cisco-Amdocs integration in an almost limitless set of scenarios. These are a few:

- Adding a new small cell gateway

- Adding a new line card for an existing chassis

- Fulfilling a customer request to create a multisite Ethernet LAN (ELAN)

- Managing the lifecycle of hardware rollout, and

- Viewing a specific hardware item in context to make the best use of its capabilities

Let's look at them individually.

Release of a Small Cell Gateway

- New hardware information flow: Cisco publishes machine-readable technical specifications in the format agreed by Cisco and Amdocs, covering all pertinent topics, such as its femtocell and WiFi functions, interface and connectivity options, encryption algorithms, quality of service provisions, and other data. The Amdocs OSS suite consumes this data and converts it into a device metadata model for its inventory records. It makes this model available to its customers, enabling them to plan and provision the gateway in their networks with minimal configuration work.

- Enhanced resource selection: Given the data about the gateway's capabilities already acquired by the Amdocs OSS, processes can select the new device automatically, as needed, for existing services.

- Single PSA interface: Regardless of operating system (OS), or OS version, the gateway can also be activated from inventory when it is needed, perhaps for a new service, with no change to existing interfaces.

- Data integrity management: As with activation, no change is required due to PSA. Live capability updates will be captured for network instances of the new device type.

This process sharply contrasts with the current way of establishing a new device, such as this gateway: For devices not in the device library, the customer requests its technical staff to create a new device model. This device model is pulled together by analyzing available information, for example, from vendor documentation and network information. The model is then built and validated; additional updates may be required for data integrity management and activation.

Release of a New Line Card for an Existing Chassis

- New hardware information flow: Cisco publishes specifications for the new line card in machine-readable form, which is converted by Amdocs OSS into a metadata model for inventory records and then disseminated to customers.

- Enhanced resource selection: When a service is being provisioned, the OSS suite recognizes and takes into account the enhanced capacity and capabilities of a router or switch chassis that has been populated with this card.

User Request to Create An Ethernet Local Area Network with Multiple Sites, Each Connected to a Backup Server

- New information flow: All information on network infrastructure is already stored in the OSS suite's inventory.

- Enhanced resource selection: The OSS is aware of all of the capabilities of various network devices and systems so it can select the appropriate ones to set up the LAN.

- Single PSA interface across Cisco domains: The OSS can use systems and devices in the Ethernet and data center domains to provision both the Ethernet transmission and the backup service.

A Device Is Added to Inventory as a Planned Device

- Event-aware data integrity management: When the device is installed, an event is published from the network and the inventory updates automatically to show that the device is now active.

- Data integrity management includes inventory synchronization and reconciliation.

A Firmware Upgrade Is Applied to a Device

- Event-aware data integrity management: A network event is published and the inventory is automatically updated to reflect both the change in firmware and any updates to the capabilities of the device.

- An example is an update of the Cisco IOS® Software operating system on a 7100 Series Router from version 12.2T to version 12.3; this action doubles the number of supported logical subinterfaces from 10,000 to 20,000. The change is duly recorded in the inventory, and the additional subinterfaces are available for use.

What Will This Do for My Company?

The Cisco-Amdocs venture cancels out the integration tax and a great deal more. The interoperability of Cisco network devices and systems and the Amdocs OSS suite will:

- Enable much more flexible service creation

- Shorten time to market

- Cut provisioning costs for new devices and new services

- Set up services involving multiple domains much more easily

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- Cut maintenance costs

- Make it much easier to satisfy customer needs and requests

Key benefits of the Cisco-Amdocs initiative:

- Serve your customers with much more agility

- Respond to requests in much shorter time frames

- Gain an advantage in retaining customers

Both Cisco and Amdocs are leaders in their fields of business. The two companies are now demonstrating their leadership in the much-needed standardization of communications between network devices and systems and the OSS that manages and supports them. We're working proactively and believe our cooperative venture will help you to streamline operations and reduce your company's total cost of ownership for network devices and systems and OSS.

http://www.cisco.com/go/fulfillment

http://www.amdocs.com/oss

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