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Migrating millions to IP:

Mission impossible? Not with a Migration Operations Center

Strategic White Paper

One of the highest risk areas for network operators involved in transforming their existing networks to IP is the migration of customer services from the legacy infrastructure to a next-generation environment. The solution is to put in place comprehensive processes and procedures that protect against cost overruns and the customer churn caused by service outages. This solution is where a Migration Operations Center (MOC) comes into play. A MOC functions as a mission-control command center at the heart of IP-transformation migration programs.

This paper describes the key business drivers for creating and operating a MOC, its critical functions and the basic principles for establishing an effective MOC organization.

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Introduction

A Migration Operations Center (MOC) program provides a network operator with a systematic approach to scale and automate the transformation of legacy infrastructure to IP. This methodical approach is required due to the scale and scope involved in migrating millions of subscribers. In the face of this mass migration, implementing traditional project-planning and management disciplines is too costly and cumbersome.

From an historical point of view, most network operators considered a large change program, such as for system deployment, as one that involved approximately 50 sites. A deployment of this size can be handled by a small team of project managers.

However, for an IP-transformation migration program, it may be necessary to migrate 5,000 nodal sites. Using managers accustomed to traditional processes, the migration can require hundreds of project managers for the three- to five-year program duration. And these project managers do not represent all the required resources: for example, resources are needed to manage internal and external stakeholders, perform the night-of-migration management and provide fallback management.

Transformation also reaches beyond the network-operations organization to many functions within the company, including sales, marketing, customer-service management, legal and supplier management. Each of these departments may want to use their own project-management approach for the transition. However, this is untenable for a large-scale transformation program and can only lead to cost overruns, missed schedules and dissatisfied users.

These demands, coupled with the need to maintain customer-service levels and the time-is-money reality of any project, drive the need to adopt the MOC approach. A centralized MOC assists the network operator in selecting methodologies and tools early in the project and can be used across departments to help the network operator reach the goal of consistency of method throughout a complex change program.

The Migration Operations Center: Critical functions

To effectively scale the network operator's IP transformation, the MOC defines processes for these key areas:

- Pre-migration management
- Migration control management (MCM)
- Fault management (support)
- Fallback management
- Schedule-change control
- Measurement and management information

Discipline in these six areas reduces the risk associated with large-scale migrations and continuous business change.

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Pre-migration management

Pre-migration management encompasses managing all the activities involved in planning, preparing and upgrading a site in preparation for migration. In this phase, all the tasks to be accomplished at each migration site need to be defined. These tasks include:

- Site audit and data validation
- Frame grooming and data cleansing
- Data management
- Equipment installation and integration

Normally there are at least 200 physical and logical tasks to be undertaken per site, and each site can be defined as a project. Because the role of the MOC is to scale and automate the process, pre-migration requires that automated tools with workflow-management capability be developed and used, allowing each site to be managed more efficiently. The results are reduced manpower requirements, a proactive and reactive management capability, increased reporting efficiency, and more accurate, consistent methods and approaches.

Historically, in large projects it was not uncommon to separate the deployment and migration efforts into different teams. Getting the new network to function correctly was considered to be a separate task from moving subscribers to the network.

However, due to the tight timeframes of most IP-transformation programs, it is critical that these teams work in unison using common processes, tools and, in many cases, similar resources. For example, it is common to have one set of field technicians who are responsible for installing the equipment, grooming the circuits and executing the physical-wiring changes during the migration window. These technicians should use similar workflow tools and processes for each of these activities. For this reason, along with the need to perform overall dynamic resource planning and schedule management, we recommend combining these activities under the umbrella of a single project team.

Migration control management

Migration control management (MCM) has three main functions within the overarching objective of managing the physical and logical migration of the legacy equipment.

The first role of the MCM is to establish quality gateways across the end-to-end migration timeline. A pre-agreed set of quality gateways is determined for migration preparation, the night of migration and post migration. How accountability changes hands and the criteria for starting the decision to fallback is also defined. A quality checklist is developed per gateway to ensure all migrations have a level of consistent management and quality that is monitored as they progress.

Another important role for the MCM is to establish a playbook to automate the night-of-migration activity. This playbook details these activities on a synchronous timeline.

As with the pre-migration tools, a generic method is configured for the unique elements at each site. For example, a switch site may use a method based on the type of switch, the connectors available and the data-migration method. The site audit conducted during pre-migration determines which generic migration method will be used at the site.

The playbook also details how resources move within or among sites; as a result, the geography of sites becomes important. Islands and large rural areas have different requirements from urban centers. Generally, sites will have an 80-percent fit with the generic tool. At that point it is only the exceptions that require custom documentation, using a mass-customization approach with the automated playbook.

MCM is also responsible for the night-of-migration management. The migration-control manager defines and sets up the communication standards, provides rules of engagement and identifies key participants (generally the migration manager, jeopardy manager, fault manager, field personnel and migration-execution engineers).

The role of the migration-control manager is to ensure that the process of migrating a site is completed in the allotted time and to an agreed-upon quality standard. The jeopardy manager handles any exceptions to the migration process and resolves them. This approach ensures that the team's focus remains on success, and exceptions are managed in a controlled and efficient manner.

Fault management

Efficient fault-management processes are a critical part of the MOC approach to migration.

In a legacy network-operator environment, there are often dozens of service desks — and there may even be hundreds if individual customer-service staff positions are included in the service model. Changing this model is time-consuming, costly and, in the case of the operator's service interfaces, often impossible. The MOC's fundamental principle of fault management is that it does not change the service model but interfaces with it using what is available.

In fault management, the MOC does not field any first-line incident calls. The rationale is twofold. First, this intervention has a negative impact on the customer-service department because it entails making changes in procedure to dozens, or hundreds, of customer-service desks. The second is that it is confusing to the customer. The practical result of changing level-one support is the necessity of communicating to every client that, if they have a problem on migration night, they need to call a different number than the usual one. Obviously, this is not the most reasonable approach.

The MOC fault-management approach is to determine where the faults reported by clients, network alarms and site technicians converge, and create a separate queue for migration-related faults at that point. The result of this strategy is that all faults during the migration are still resolved within agreed service level agreements (SLAs). The business-as-usual (BAU) fault-management processes are left intact, and the process is seamless to the network operator. In addition, the number and type of faults introduced after migration can be calculated and analyzed, increasing the efficiency of the ongoing migration process.

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Fallback management

Fallback management refers to managing the decision process that determines when fallback is required. Prior to migration, the quality criteria to monitor are identified and breach levels are determined. Common quality categories include: fault levels; quality of service (QoS) attributes such as jitter, lag, packet loss or data throughput; and process fall-out. The fallback manager monitors the network performance against the agreed breach levels. If a breach occurs, the fallback manager manages the decision-making process for fallback.

If the migration process goes into fallback, either during the migration or post migration, part of the MOC shifts from a migration-focused organization to a fallback organization. Fallback procedures are defined for every migration procedure. It is important to note that managers, not processes and procedures, determine when to fall back. Managers must weigh customer-service concerns, cost concerns, timelines and many other variables when making their decision.

Communication is a critical fallback-management function. The person to contact before, during and after fallback is predefined and communications are documented in advance. This preparation helps ensure timely, efficient, appropriate communication throughout the high-pressure fallback process.

Managing fallback as a separate function offers multiple benefits, including:

- Decreased risks associated with migration
- Efficient service restoration
- Comprehensive communications management, reducing customer and operator impact
- A full audit trail to capture learnings and avoid repeating problems in the future

Schedule-change control

Schedule-change control is used in conjunction with the migration schedule to:

- Create a consistent format that is acceptable to the business and the operator
- Communicate in a consistent manner
- Manage for change against a set of agreed criteria
- Report consistently using defined channels

Because a full migration can potentially span years and thousands of nodal sites, a well-defined and managed schedule-change control and management plan will optimize the required resources.

Schedule-change control is also needed to provide the operator and consumers with the reporting that is requested or required by regulators, for example how many subscribers have been moved and when each individual's service will be migrated.

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Measurement and management information

The measurement- and management-information function is designed to capture key reporting metrics such as the number of customers migrated, first-time-right percentage, time-to-repair error, and average outage times. This information can provide valuable data on vendor performance as well as metrics that can be used to inform important business decisions and optimize value for the migration program and the business.

Principles for developing a MOC organization

There are several important principles to consider when developing a MOC organization for supporting an IP transformation.

Engage stakeholders

Migration will reach across the company, moving beyond the organization's operations and migration functions. It is important to identify and engage key stakeholders up front and to interface with all the necessary support functions, such as marketing, legal, IT, operations, media communications and special services. This engagement ensures establishing more realistic program timelines and goals, and reduces the likelihood of encountering obstacles from within the company. A consequence of having such a wide stakeholder base is that requirements control is mandatory. Without strict governance and policy relating to requirements control, the scope and boundaries of design can quickly escalate out of control.

Integrate BAU functions

Integrate BAU functions wherever possible; leveraging existing resources is more efficient than replication. Furthermore, reinventing existing processes can uncover many BAU problems, evolving the program into a vehicle for fixing these problems, which is not its goal. Due to the wide-ranging nature of the requirements, the large stakeholder base and the tendency for scope creep, it is advisable to freeze the scope at phased intervals, deliver a baseline and then accommodate change. This process helps the network operator to meet its goals of tighter control of project resources and closer adherence to budgets, timelines and scope.

Anticipate IT support requirements

Never underestimate the scale, cost and time required to develop supporting IT systems. IT is one delivery area that is known to slip in time and expand in scope. To avoid these outcomes, it is essential to determine IT-system-development paths and methods, the reliance of the transformed infrastructure on IT and the preferences for commercial off-the-shelf (COTS) or proprietary systems as early as possible in design.

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Conclusion

Based on Nokia's experience with the early adopters of IP-transformation programs, migration presents a significant logistical challenge. A network operator's general BAU project-management approaches are bound to falter in such a transformation project. The MOC approach has emerged as the best practice for mitigating the risks during, and optimizing the necessary investments for, a successful migration.

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