Roll-out of a Digital Workplace

Description of the core processes of an operating system upgrade

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Abstract: The rollout of a new version of an operating system can be performed through the upgrade of the operating system on existing devices as well as the replacement of hardware. In this contribution, we propose core process steps and activities to perform both kinds of migrations.

Keywords: Replacement of hardware, upgrade operating system, plan and manage roll-out.

1   Introduction

Changes of the operating system create a strategically relevant risk, which should be managed accordingly [Gu+16] to turn it into an opportunity. Analogously to the rollout of an ERP system [Br14], upgrades of the operating system need to be planned in advance to use the change to realize some strategic improvement.

The first step therefore is to define the future roadmap for the development of the workplace. Which features will be enabled and which have to be disabled, e.g. due to risk or compliance issues? After configuring the new version of the operating system the rollout should be in alignment with the overall project portfolio [De17], allowing a better resource management of personnel resources, especially support resources.

In this contribution, a proposal for the core processes for the roll-out of an operating system upgrade are elaborated.

2   Overview of the rollout process

The procedural model proposed starts by setting the scope of the rollout (Figure 1). Exemplary decisions regarding the scope might be which kind of devices shall be included (e.g. office vs. production), which device models are included, etc.

After the overall definition of scope, all devices in scope should be scanned to determine which applications and respective versions are currently installed. Once the software application landscape is clear, a first determination of software readiness of the currently

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running applications on the devices shall be performed. The determination of software readiness shall be continued throughout the whole project, starting with the most installed ones in decreasing order of installation counts.

Figure 1: Preparation of the rollout process

3 Migration methods and procedures

In the following sections, the main processes and related actions are described for hardware exchanges i.e. replacements and inplace upgrades.

Both migration types start by forwarding a user requirements form (URF) to the device owner. The data obtained from the URF can be categorized in two major following domains:

- **General asset information**: E.g. the device location and the current user to 1) update current asset data and 2) allow support at the proper device location.
- **Required software:** Opt-in for currently installed software to reduce license costs for software not needed anymore after the upgrade

3.1 Migration via inplace upgrade

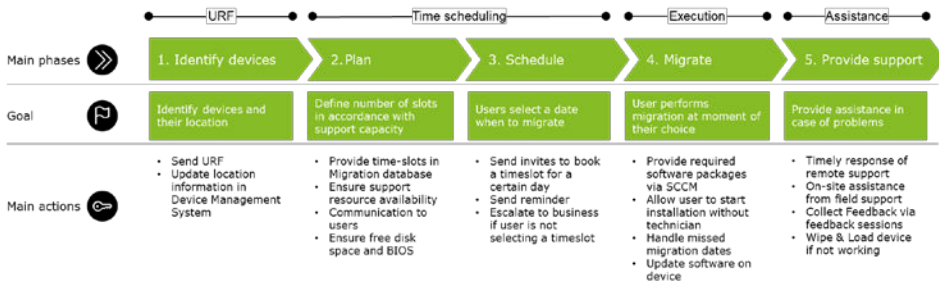The following Figure 2 shows the different steps proposed for inplace upgrades.

Figure 2: Process of migrating via inplace upgrades

In a first step, the responses from the URF are processed. For inplace upgrades, users shall generally keep applications that are already installed, hence the URF shall mainly

be used to determine where the device is located so that support staff can access the device.

The second step consists of planning the rollout. Herein, the support capacity from the support organization that assists in case of inplace upgrade failure shall be the starting point for all planning. Required resources could be calculated based on the excepted failure rates (e.g. with a 10 percent failure rate, 80 upgrades run and produce 8 failures that can be covered by a technician per day if one hour is needed to fix each failure). Once the amount of slots has been determined, they represent the basis for all planning.

The third step consists of executing the scheduling. In this step, the user shall receive the invitation to book a specific day for the migration. This is needed to mainly steer the network utilization and support capacities. If the user does not book a specific day, he shall constantly be reminded to do so. A small amount of users does not book a time slot after multiple reminders and will get migration dates automatically assigned.

The fourth step is the migration process itself. From a technical perspective, the required software packages for the inplace upgrades shall be provided to the device with sufficient lead time. The user shall start the inplace upgrades by himself. In case that the user misses to perform the inplace upgrade on the day of his migration, he will receive one or two more reminders until also a forced migration is scheduled.

The fifth and last step consists of providing support in case that the upgrade produces an error. There are two input channels for the support organization to start acting:

- User contacts the support organization and requests help
- An automated monitoring system creates a support ticket in case that a failure might have occurred

Once the support organization is requested to act, it shall assist the user in resolving the problems encountered. As a last resort, the support organization shall perform a "wipe and load", resulting the hard drive to be formatted and the operating installed afterwards.

3.2   Replacement of devices

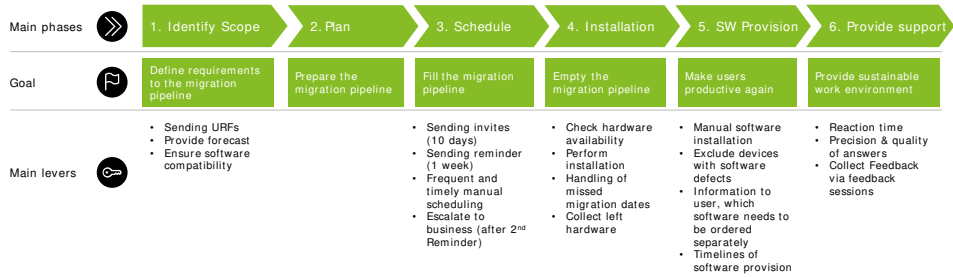| Main phases	1. Identify Scope	2. Plan	3. Schedule	4. Installation	5. SW Provision	6. Provide support
Goal	Define requirements to the migration pipeline	Prepare the migration pipeline	Fill the migration pipeline	Empty the migration pipeline	Make users productive again	Provide sustainable work environment
Main levers	• Sending URFs • Provide forecast • Ensure software compatibility		• Sending invites (10 days) • Sending reminder (1 week) • Frequent and timely manual scheduling • Escalate to business (after 2nd Reminder)	• Check hardware availability • Perform installation • Handling of missed migration dates • Collect left hardware	• Manual software installation • Exclude devices with software defects • Information to user, which software needs to be ordered separately • Timelines of software provision	• Reaction time • Precision & quality of answers • Collect Feedback via feedback sessions

Figure 3: Process of replacing devices

The first step of the replacement process consists of forwarding the URF. Within the URF, users should be able to choose which device they'd like to use in the future and what applications shall again be installed (only opt-out of currently installed devices). In addition, users shall be informed which software needs to be ordered separately and be encouraged to do so in a timely manner. Based on the results of the URF, a new device shall be prepared for the user in step four.

The second step is the preparation of the migration pipeline. In this step, devices with compatible software are released to proceed within the replacement process.

The third step consists of scheduling. Herein, the users shall select a date and time for the exchange of their devices. In order to assure a timely booking of dates, users need to be frequently reminded. If users are reluctant to book a date, the business intervenes and requests users to book their appointments.

The fourth step consists of preparing the devices and installing the required software. The devices shall be handed over to the user by an technician at the agreed moment. Additionally, the old device is taken away and will be deactivated.

The fifth step consists of installing the remainder of the software after the device has been handed over to the user. Exemplary issues could raise from applications that need to be installed manually which will be done by a remote support.

The sixth step consist of making users productive again by assuring that support is provided, e.g. in case that applications continue to be missing.

4   Rollout steering via proprietary solution

In order to steer the rollout, a proprietary solution could be used as depicted in the center of Figure 4.

Regular exchange   Manual exchange

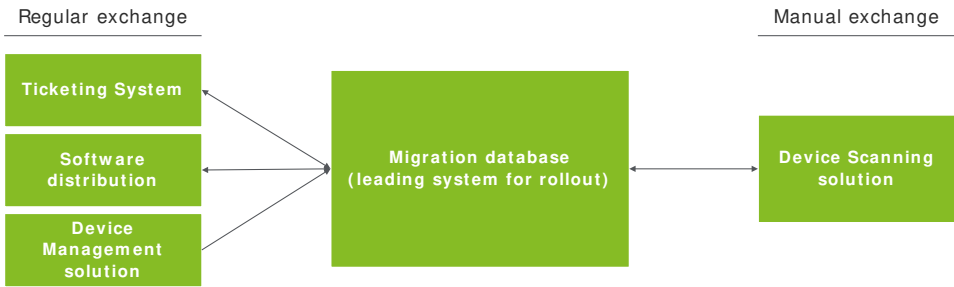| Ticketing System | | |
| Software distribution | Migration database (leading system for rollout) | Device Scanning solution |
| Device Management solution | | |

Figure 4: Rollout steering via the migration database

At the beginning, the migration database (MDB) initiates the creation of tickets for hardware exchanges within the ticketing system. The ticketing system afterwards provides information regarding the current state of hardware exchanges. All steps of the hardware exchange process (e.g. book a timeslot, software has been installed on device, successful handover) are reflected in different states of tickets.

The software distribution system acts differently, depending on the kind of migration:

- For replacements, information shall be received from the migration database regarding which software is subject to be installed on the target devices
- For inplace upgrades, the installation script and package provisioning shall be triggered. The software distribution shall report the status of the inplace upgrades back to the migration database.

The device management solution shall provide master data updates to the migration database. The updates could contain e.g. the name of a new device user or a new classification of how the device is used (e.g. factory).

The device scanning solution should determine which software and version is running on a device. This information is used by the migration database to determine consolidation options for the case that a software product is exchanged by a different one.

5   Conclusion

The roll-out processes and main activities for an operating system upgrade via inplace upgrades and replacements were described in this contribution. Starting from the existing base of software and devices, the core rollout processes are executed, resulting in a migration to the next version of the operating system. Due to the opt-in in the User request form the software asset is cleaned-up resulting in lower license cost. The processes described above are very user-centric as the users choose migration dates themselves. The processes, technical execution and user support are subject of continuous alignment and

improvement. A quick support after a failed migration is key for the user acceptance to migrate.

Literature

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