APPENDIX 3

DESCRIPTIONS OF WHAT IS TO BE OPERATED (AS IS DESCRIPTIONS)

[Contractor name]

[Contractor logo]

Contents

1 INTRODUCTION

This appendix provides descriptions of the services that are currently operated by NRK, and that are set to be operated by the Contractor. The descriptions include the following sub chapters:

- Overview
- Strategy
- Offered services
- Service levels
- Users
- Projects
- Hardware and software
- Interfaces with other functions

Descriptions of the Service Desk services are found in chapter 2 and descriptions of Client services are found in chapter 3.

Note that descriptions in this appendix mainly describes how **these services are operated in NRK today and not necessarily how NRK wants these services to be operated in the future.** In some cases, "AS IS" will be equal to "TO BE", while in other cases, "AS IS" is different from "TO BE". The descriptions in this appendix describes how the Contractor can expect the services to be at the point of transition and before execution of any transformation. See appendix 1 for descriptions of future needs and requirements for transformation for the services included in scope.

2 SERVICE DESK SERVICES

2.1 Overview

The current Service Desk is SPOC (single point of contact) for IT incidents and inquiries internally in NRK, including the Regional Offices. It performs first line support on PC, Mac, mobile devices, printers, software and applications. At the Headquarter in Oslo it performs on-site support for approx. 2500 employees. To increase the level of self-service the Service Desk maintains a web portal with information, knowledge base and self-service manuals. Together with an automated and self-service Password recovery this has reduced the number of inquiries to the Service Desk. Statistics of inquiries are made to help create action plans designed to correct and minimize errors. The Service Desk employs 11 technicians, whereas two operate the phone, and nine handle incoming inquiries by ticketing system and chat, onsite support and other incidents that cannot be solved by phone. The opening hours are from 08:00 to 16:00 (Monday - Friday). After 16:00, incoming calls are forwarded to an operations bridge which handles production critical inquiries and technicians on-call.

2.2 Strategy

The overall purpose of the current Service Desk services is to contribute to solve errors, problems and needs as fast as possible and to provide user support in order to help increase the efficiency of employees. The objectives below should help achieve this. Refer to appendix 1 for descriptions of the vision and objectives of the future Service Desk services for NRK.

The function as a SPOC implies that the Service Desk provides one point of contact for inquiries in order to simplify the users' situation. Incidents, the need for support and inquiries are reported to the Service Desk. Still some incidents within the publishing area and production area are reported directly to the "Operating Bridge" or operation groups.

Short response time and short solution time in order to safeguard time critical inquires. The employees of NRK work within administration, media production and publishing. High pace of work and short deadlines means that there are very high expectations to Service Desk services. This does particularly apply to media production and publishing where short response and solution times are critical. The Service Desk will, together with those who report the incident, consider how it affects NRK's production or publishing and prioritize the incident accordingly.

Good communication in order to safeguard the users' need for information.
The Service Desk has an important role in communication with the users and has a responsibility to follow-up on incidents until they are resolved. Communication channels such as Workplace and Slack are used by the Service Desk to inform about major error conditions that may affect many users.

High resolution rate at 1st line support to provide the users with the fastest possible solution. Therefore, the Service Desk must be able to handle inquires both related to general IT, the use of office tools and basic use of NRK-specific applications. To provide basic support for such applications The Service Desk must know the basic use of them, the most common error situations and how to solve them. Today, the 1st line support solves approximately 80% of the cases.

Well-functioning interaction with 2nd line support to ensure that errors are solved efficiently. The Service Desk must be able to assess which part of the 2nd line support that should handle the case further. In these cases, the Service Desk must, according to agreed routines, ensure that correct questions are asked to ensure that necessary meta information follows the case to the 2nd line support.

Availability through multiple channels to simplify the contact with users. The Service Desk is available for all NRK's users via phone, chat and through the ticketing system. At NRK's headquarter in Oslo, the users can also approach the Service Desk's onsite team.

Provide support to relevant devices and tools.
The Service Desk must provide support on the platforms, tools and devices that are used by NRKs employees. Use of smart phones have become an important part of both administrative work, media production and publishing. To provide support related to the use and functionalities of smart phones is therefore an important part of the Service Desk's tasks.

Self-service and automations for efficiency improvements and availability.
NRK wants to facilitate a higher degree of self-service and automated services for employees. The goal is to increase efficiency for both the users and the Service Desk and to offer a service that is available 24/7. Today, The Service Desk publishes manuals, known solutions and tips and tricks on its own portal. In addition, an automated service for issues related to password and unlocked user accounts, has been developed.

2.3 Offered Services

Today, the Service Desk performs the following services:

- SPOC/Incident management
- Logging
- Categorization
- Prioritization
- 1st line support for end users
- 2nd line support for PC and Mac
- On-site support
- Installation of machines
- Escalation
- Knowledge base updates
- Preparation of statistics
- Service automation

2.3.1 SPOC/Incident management

Both incidents and service requests are handled by the Service Desk which must interact with both the users and the 2nd line support. The interaction between the Service Desk and the users goes through different channels such as phone, direct e-mail, the ticketing system, walk-in, chat or self-service via the Portal. The ticketing system is used for interaction between the Service Desk and the 2nd line support. Critical inquiries related to production and publishing typically involves phone communication between the Service Desk and the 2nd line support. The Service Desk does not have the responsibility to monitor Events, as this is performed by Bifrost, another unit. There is still a close dialog between the Service Desk and Bifrost.

2.3.1.1 Overview of incidents to the Service Desk
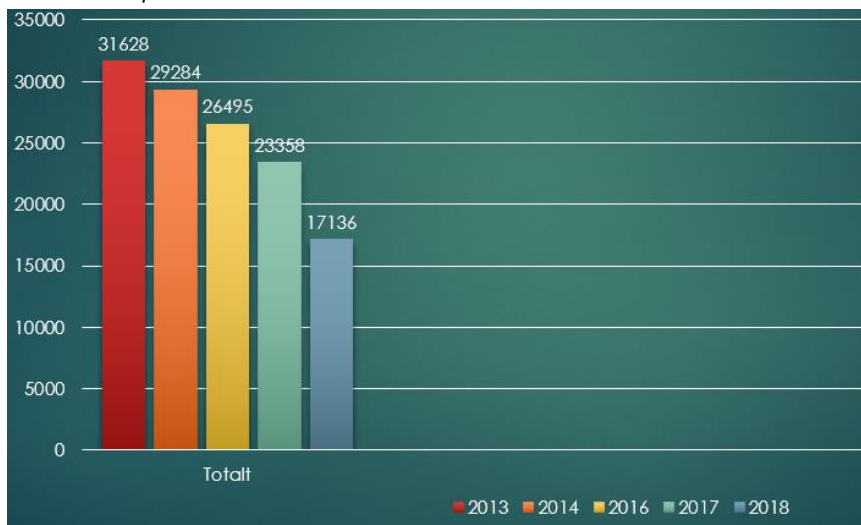*Number of phone calls to the Service Desk from 2013-2018.*

Figure 1: Number of phone calls to the service desk from 2013-2018

Number of phone calls per month:
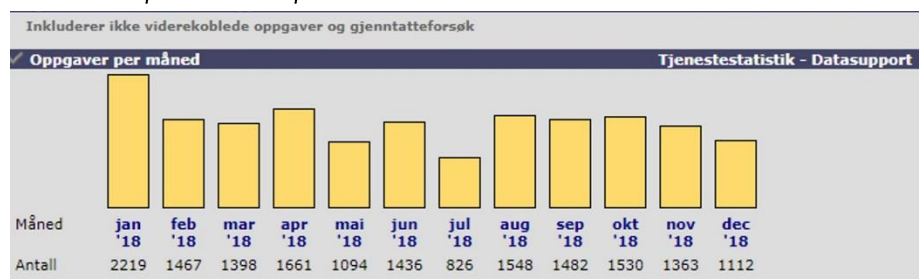
Figure 2: Number of phone calls per month

Telephone response time:

Ventetid	Antall	Akk %	
0-10 sek	3519	23	
10-20 sek	6629	65	
20-30 sek	1035	72	
30-60 sek	1053	79	
60-120 sek	1259	87	
120-240 sek	1409	96	
240-900 sek	669	100	
900-3600 sek	4	100	
3600-86400 sek	0	100	
Mer enn 86400 sek	0	100	
Totalt	**15577**		
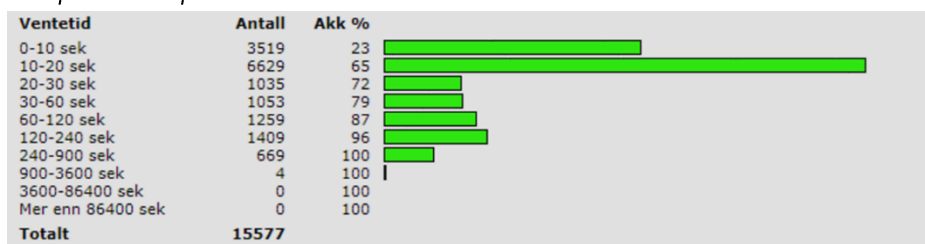
Figure 3: Response time telephone 2300

Missed calls, with waiting time:

Ventetider tapte oppgaver	
Ventetid	**Antall**
0-10 sek	332
10-20 sek	137
20-30 sek	61
30-60 sek	210
60-120 sek	315
120-240 sek	329
240-900 sek	167
900-3600 sek	2
3600-86400 sek	0
Mer enn 86400 sek	0
Totalt	**1553**
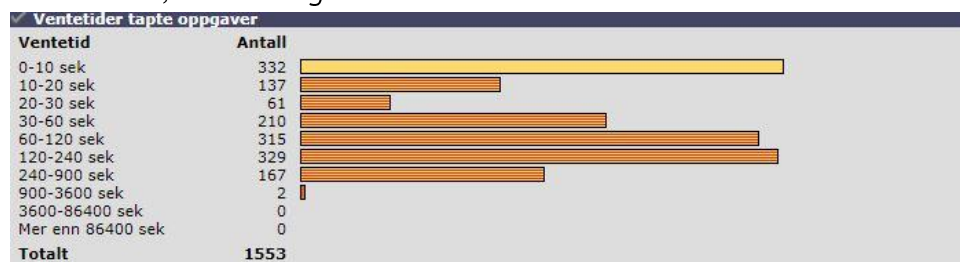
Figure 4: Number of missed calls to 2300

Telephone inquiries per hour within opening hours:

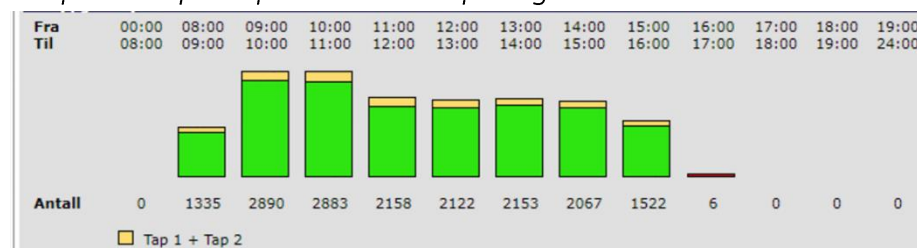| Fra / Til	00:00 08:00	08:00 09:00	09:00 10:00	10:00 11:00	11:00 12:00	12:00 13:00	13:00 14:00	14:00 15:00	15:00 16:00	16:00 17:00	17:00 18:00	18:00 19:00	19:00 24:00
Antall	0	1335	2890	2883	2158	2122	2153	2067	1522	6	0	0	0

Tap 1 + Tap 2

Figure 5: Telephone inquiries per hour to 2300

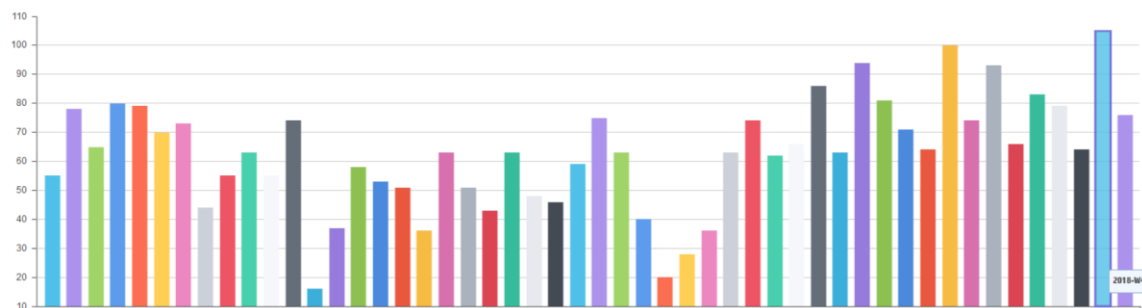*Number of incidents solved by 1st line Service Desk sorted by week. Week 1-50, 2018.*

Figure 6: Number of incidents solved by 1st line at 2300 (incident not escalated to other groups)

The report shows number of registered cases within the most used services in 2017 and 2018.

Service	2017			2018	
	Interactions	Incidents		Interactions	Incidents
User account	3258	2322		1776	2818
OS Windows client	1701	1405		1834	1600
Adobe Premiere	511	451		446	393
Program bank system	930	877		757	736

OS MAC client	598	443		509	426
Distribution lists	342	340		350	343
PC rental	239	242		218	219
Office	822	368		347	236
Office 365	33	25		185	111

Figure 7: Overview of cases to 2300 within the most used services

An *interaction* is an inquiry to the Service Desk. If not solved directly, the interaction must be escalated to 2nd line support, and then the interaction becomes an *incident*.

Most of the interactions to the Service Desk are related to the following cases:
- VPN – installations, guidance and troubleshooting
- User administration
- Users need admin access
- Installation of software
- Installation of computers
- Setup of mobile phones
- Connecting and troubleshooting of docking stations and docking screens
- Office 365 – troubleshooting and guidance
- Hardware errors - PC and Mac, ordering of service, dialog with external technicians and quality assurance
- PC rental for travels and projects
- Wi-Fi – troubleshooting, guidance and access to wi-fi for guests

Interaction to the Service Desk comes through different channels.
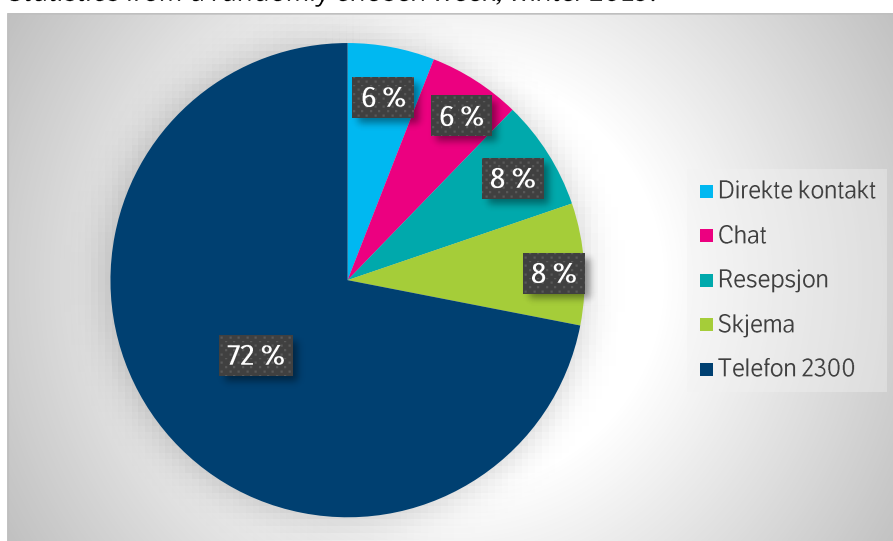*Statistics from a randomly chosen week, winter 2019.*

Figure 8: Overview of percentage of interactions through different channels

Overview based on numbers from ITSM system, chat and the phone system, 2018. The numbers for the reception and direct contact are calculated.
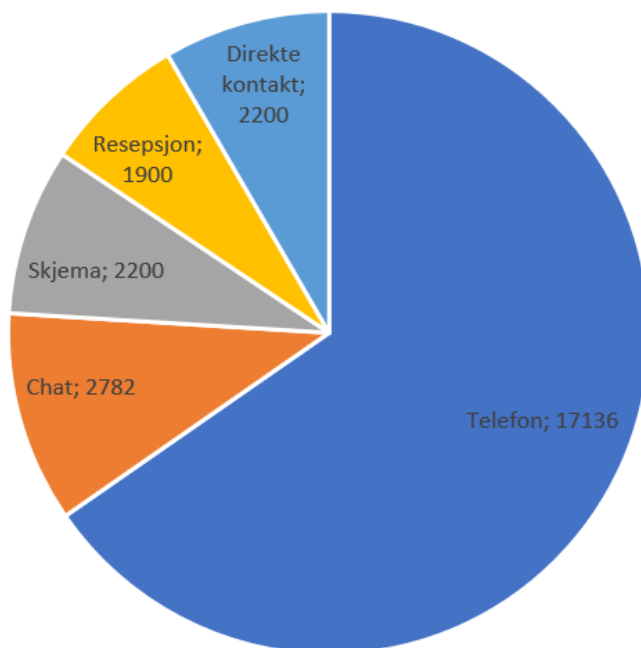

Figure 9: Number of inquiries through different channels in 2018

2.3.2 Logging

The Service Desk is responsible for logging all the interactions. The interactions are identified, scheduled and logged in the ticketing system.

2.3.3 1st line support and user support

The Service Desk provides 1st line support including general IT user support, office tools and basic use of NRK-specific applications. 1st line support and user support for smart-phones setup and use is also provided.

2.3.4 2nd line support for PC and Mac

Incidents regarding errors on PCs and Macs that cannot be solved by 1st line support, phone or chat, are transferred to the part of the Service Desk that is referred to as "2nd line support for PC and Mac". In the case of hardware exchange an external service provider is contacted and necessary reinstallations are performed. This part also handles cases that require onsite support and those that are reported through the ticketing system.

Table 1: Solved cases on 2nd line support Service Desk

	2018	2017
Total number of solved cases	3533	3208

2.3.5 Managing user access

The Service Desk manages access to storage areas, cloud services and software. Access is controlled by group memberships in Active Directory.

2.3.6 Onsite support

The Service Desk provides necessary on-site IT-support at the headquarter in Oslo.

2.3.7 Installation of machines

The Service Desk performs new installation and reinstallation of both PC and Mac.

2.3.8 Change Management

The ticketing system is also used for Change requests. Change requests are registered in the ticketing system and are processed by the internal CAB. The leader of Operational IT is also in charge of CAB which consists of members from different operational areas. Defined standard changes can be applied without going through CAB.

2.3.9 Escalation

An incident that cannot be solved by the Service Desk will be escalated to 2nd line support, that consists of operative groups within the different areas. Transfer of cases is done through the ticketing system. In cases that are critical for production and broadcasting, the Service Desk must still always alert the relevant operative groups via phone.

The table below gives an overview of the number of escalated cases sent to various operation groups. Numbers are based on the ticketing system, 2018.

Table 2: Overview of the number of escalated cases to operation groups

Category	Number of cases
Service Desk 2nd line support	3317

User administrations	1700
Program bank (Media projects)	884
Wi-fi	773
Editing	549
Media production equipment	244
PC rental	228
AD and Exchange	180
Client	152
Printer	151
Server and storage	149
System Operation	109

2.3.10 Knowledge base updates

The Service Desk updates the knowledge base that is available for the users through an own proprietary web portal. The portal contains information and manuals for self-service.

2.3.11 Preparation of statistics

The Service Desk prepares and makes statistics available on registered cases, types of cases, handling and escalation of cases, response time and resolution rate, and the use of the portal and automated services.

2.3.12 Service automation

Services related to password change and unlocking of user accounts are automated and administrated by the Service Desk. The users can easily change passwords and unlock user accounts in FastPass Password Manager. As a result of new routines and rules for passwords in 2018, the use of this self-service has decreased considerably.

2017

Accounts Unlocked - Total Statistics

Year	Month	Count
2017	12	960
2017	11	1006
2017	10	757
2017	9	694
2017	8	1790
2017	7	574
2017	6	937
2017	5	1419
2017	4	1151
2017	3	1649
2017	2	1585
2017	1	2117
2017	Total	8376

Password Resets - Total Statistics

Year	Month	Count
2017	12	762
2017	11	610
2017	10	464
2017	9	362
2017	8	1147
2017	7	550
2017	6	729
2017	5	606
2017	4	494
2017	3	511
2017	2	804
2017	1	744
2017	Total	7783

Figure 10: Overview of accounts unlocked and password resets in 2017

2018

Accounts Unlocked - Total Statistics

Year	Month	Count
2018	12	79
2018	11	138
2018	10	137
2018	9	132
2018	8	224
2018	7	118
2018	6	135
2018	5	185
2018	4	282
2018	3	283
2018	2	432
2018	1	1128
2018	Total	3273

Password Resets - Total Statistics

Year	Month	Count
2018	12	146
2018	11	200
2018	10	257
2018	9	173
2018	8	349
2018	7	224
2018	6	251
2018	5	273
2018	4	468
2018	3	495
2018	2	372
2018	1	585
2018	Total	3793

Figure 11: Overview of accounts unlocked and password resets in 2018

2.4 Service levels and priority

In the ticketing system today, each inquiry is assigned a priority code. The priority code provides information on which deadline that is applicable for the interaction. The assigned priority is the sum of the *impact* and *urgency* divided by two (any decimals are removed).

$$\frac{impact + urgency}{2} = Priority\ (-potential\ decimals)$$

E.g. impact = 2 and urgency = 3 give priority =2

Table 3: Description of impact categories

Impact	
1	The entire NRK or broadcast are affected
2	Several hundred persons, and an entire regional office or production are affected
3	A few persons are affected
4	One person is affected
Urgency	
1	Critical for broadcasting
2	Production
3	Support system
4	Non-critical

Table 4: Description of urgency categories

Table 5: Description of deadlines corresponding to priority levels

Priority	Deadline for startup of case	Deadline for closing of case
1	10 minutes	2 hours
2	30 minutes	4 hours
3	4 hours	10 hours
4	1 day	5 days

Although these are the formal SLA-requirements, the follow up of these requirements has been given high priority up to now.
In practice the Service Desk usually possesses a clear awareness of which cases that may affect media production or publishing. These cases are prioritized and handled immediately. Other cases, when there is lack of resources for example, may exceed the deadlines mentioned above.

2.5 Users

2.5.1 Different categories of users

Among NRK's 3,500 employees, approximately 2,500 work at the headquarter in Oslo. The rest are located in the 16 regional offices of NRK.

There are approximately 2,100 journalists that produce content to television, radio, internet and mobile. Approximately 400 employees work within different parts of media production and broadcasting.

Inquiries from journalists and employees within media production, especially concerning proprietary equipment for production and publishing, are normally directly routed to 2nd line support. Inquiries reported from these users related to the use of PC, Mac and mobile are normally solved by 1st line support. PC, Mac and mobile are important tools in media production and publishing. Therefore, inquiries of this kind may be critical and have a high priority. Because of deadlines, these types of inquiries will normally be reported through phone.

Approximately 1,000 employees are working with technology and administrative tasks through various support functions. Most of the inquiries from this user group apply to the use of PCs and smart phones and are normally solved by 1st line support. To some extent, cases concerning administrative systems have to be routed to 2nd line support. These types of inquiries are reported both via telephone, chat, web and physical attendance.

2.5.1.1 Case flow between the users, Service Desk and solution groups
The figure below shows the AS IS case flow between users, Service Desk and operation groups.
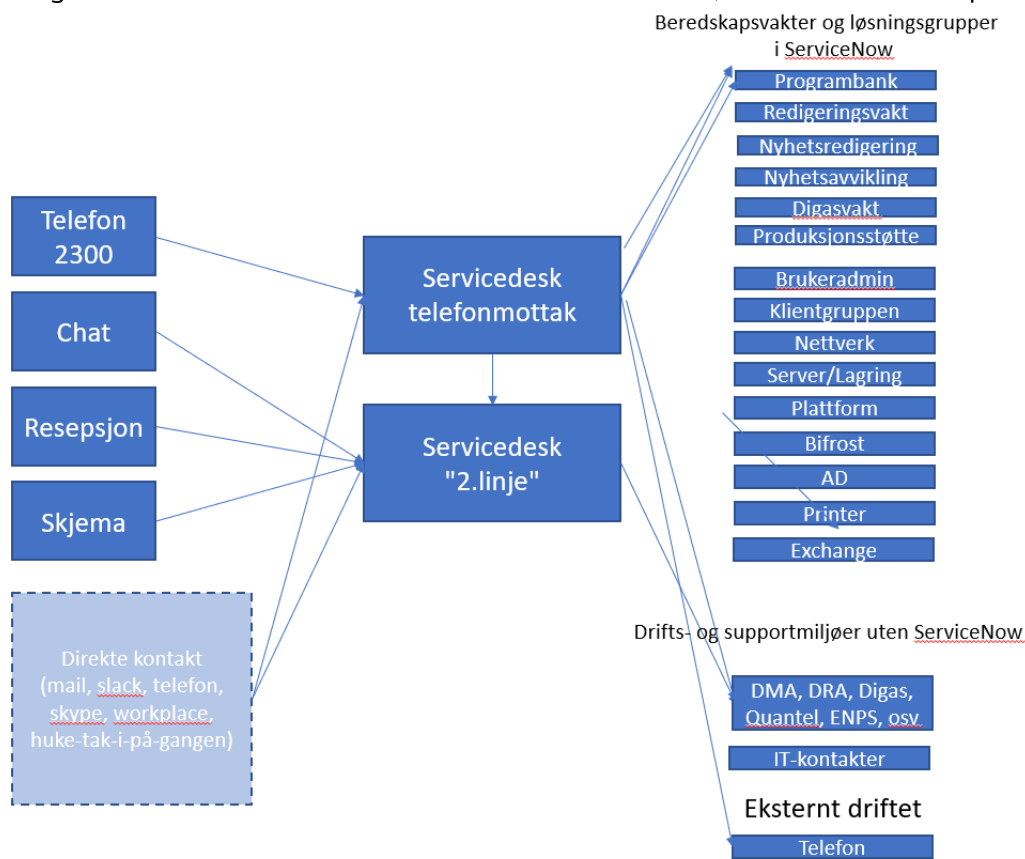

Figure 1 - Overview of case flow

2.6   Projects

There are two ongoing projects related to the Service Desk area:

Table 6: Ongoing projects related to the service desk

Project	Timeline	Description
Replacement of ITSM tool (ticketing system)	In production since April 2019	ServiceNow replacing HP Service Manager
System for self-help/Web portal	In production	In production. Continuous maintenance and development.

2.6.1   Replacement of ITSM tool

ServiceNow is now being implemented as the ticketing system for several areas in the company, including the Service Desk. The implementation started in the spring of 2019 and has been the Service Desk tool since May 2019. All inquiries to the Service Desk, including on-site support, are registered to give a full overview of service inquiries. NRK will also use its own ServiceNow as the mandatory ticketing system after outsourcing the Service Desk.

2.6.2   System for self-help

The service is already implemented and in production. The service is based on a WordPress site called "Portalen.nrk.no" and is handled in cooperation with the Service Centre ("*Servicetorget*"), which takes care of administrative routine work. The Service Desk offers user manuals for self-help, tips and tricks for PC, Mac and mobile while the Service Centre ("*Servicetorget*") offers guidance and help on various topics, such as employee benefits, the location of meeting-rooms at the headquarter, how to order food for meetings, how and where to create inquiries, etc.

2.7   Hardware and software

2.7.1   Hardware

Approximately 80 % of NRK's current computers are PCs while 20 % are Macs. The Service Desk provides support for both platforms. The employees of the Service Desk use own PC or Mac and smartphone. 70% of the smart phones in NRK are iPhones, and therefore account for most of the mobile related support from Service Desk. The Service Desk has a number of computers that can be borrowed/rented temporarily in case of i.e. malfunction. The Service Desk also has a LAB with fixed installation of screens and docking stations which are used for troubleshooting of computers and specific installations/reinstallations. The Service Desk

maintains approximately 200 rental clients which can be rented for production and other events. See appendix 3 attachment 1 for an overview of NRK's current client portfolio.

2.7.2 Software

The table below describes a selection of the applications and tools that the Service Desk utilizes in order to perform its services:

Table 7: Overview of tools and software used by the service desk today

Software	Purpose
Fast Pass password manager Self - Service	Unlocking and resetting of passwords
Intercom Live Chat	Chat channel to the Service Desk
ServiceNow	ITSM-tool (ticketing system)
Trio IP-telephony	Telephone system in NRK
Office 365	Office tools, interaction and storage of documents
Slack	Interaction
LANRev	Software distribution
Atlassian Confluence (documentation)	Documentation
Wordpress ("NRK-portalen")	Intranet portal
Workchat	Chat at Workplace – internal communication at the Service Desk
Service catalogue	Service catalogue with link to system documentation
Workplace	Internal communication in NRK
AD	Microsoft's AD
LAPS	Tool for local admin passwords on PCs.
Skype	Communication, online meetings
WDS / Remote Installation Server	Reinstallation/installation of PCs
BitLocker-tool	Unlocking of machines
F5-website log for troubleshooting	Used for VPN-problems
Password-lock log	
Canon Remote – printer display	Remote administration of printers
Filewave	Software distribution
ASG Remote Desktop	Rdp tool
BA (Brukerautomasjonen)	Internal developed system for user automation

See appendix 3 attachment 2 for an overview of other software used in NRK.

2.8 Interfaces with other functions

Service Desk cooperates closely with different functions. Some of these functions may in some cases have partly overlapping responsibilities. This requires a close and good cooperation between Service Desk and these functions. See Figure 12 for an illustration of the interfaces between the service desk and other functions. All boxes except "External partners" are internal today. However, after selecting a Contractor, the white boxes "Service desk" and "Operation group client services" will be external and handled by the selected Contractor.
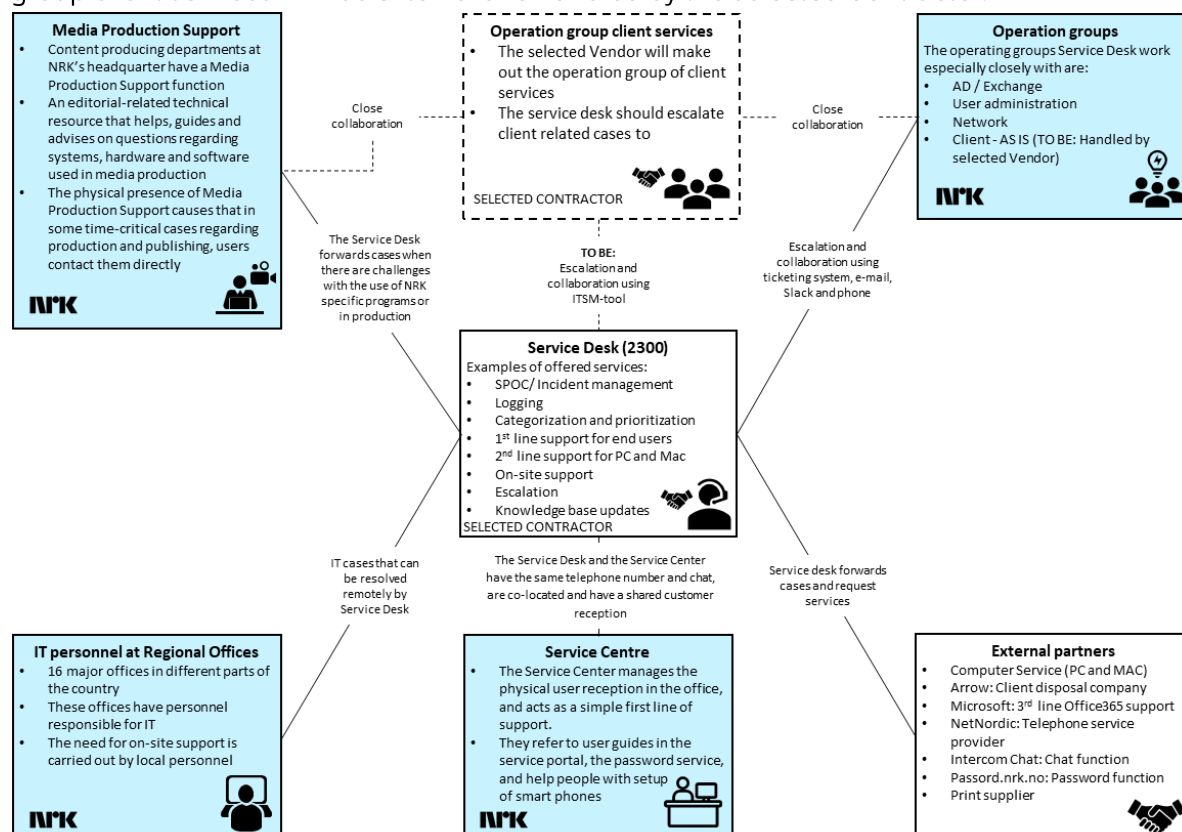

Figure 12: Interfaces between the service desk and other functions

IT personnel at the Regional offices

In addition to NRK's headquarter, there are 16 major offices in different parts of the country. The need for on-site support is carried out by local personnel that is responsible for IT. Incidents that can be resolved by Service Desk should be directed to the central Service Desk at NRK's headquarter. In practice today, local presence means that a significant part of the cases is directed to local IT personnel.

Media Production Support

Content producing departments at NRK s headquarter, such as News, Sports, Entertainment, Documentary and Culture have a Media Production Support function. This is an editorial-related technical resource that helps, guides and advises on questions regarding systems, hardware and software used in media production. Media Production Support is physically located in each department. Due to their presence, some time-critical cases, regarding production and publishing, are directed at them instead of contacting the Service Desk. Such events require clear routines and a close collaboration between the Service Desk and the Media Production support. The Service Desk forwards cases it cannot solve to Media Production Support, in particular when there are challenges with the use of NRK-specific programs or in production. In case of critical urgent cases in these areas, the Service Desk will contact technicians on-call.

Service Center (Servicetorget)

The Service Center is the contact point and help center for house and staff services.
The Service Desk and the Service Center have the same telephone number and chat, are co-located and have a shared customer reception.

The Service Center manages the physical user reception in the office, and acts as a simple first line of support. They refer to user guides in the service portal, the password service, and often help people with setup of smart phones.

Phone: When employees call 2300, they choose between option 1: Service Desk, and option 2: Service Center.
Chat: All new chat inquiries are sent to a common inbox, where Service Desk or Service Center respond continuously, depending on the area of responsibility.
Service Portal: The Service Center owns "portalen.nrk.no", a service and self-service portal with a link collection for most NRK tools and a knowledge base that applies to everyone in NRK. It is the Service Desk's responsibility to update IT related articles in the knowledge base.

Operation groups

Service Desk cooperates with several operative groups internally in NRK. This collaboration takes place via a ticketing system, e-mail, Slack and phone. The main groups are:

- **AD/Exchange:** This collaboration has been particularly close after the transition to Office 365. The communication takes place primarily via the channel #NRKiSkyen on Slack in addition to escalation of cases
- **User administration:** Service Desk escalates a large number of cases to this group via the ticketing system. The cases are primarily within access management.
- **Client**: The client group is responsible for image and software distribution on PC and Mac, and for mobile setup in NRK. Much of the communication takes place via e-mail. A number of issues have also been escalated via the ticketing system.
- **Network:** Service Desk escalates quite a few cases to Network, mostly regarding patching new data points and debugging of LAN and WLAN.

The case flows are outlined in chapter 2.5.1.1. They do primarily relate to the escalation of cases, the cooperation between groups on certain issues and the communication about the status of cases.

External partners

- *Computer Service:* PC and Mac hardware failure are reported to the Contractor, which sends a technician that repairs according to the relevant warranty. This usually happens the next business day
- *Arrow:* Return of used, outdated, excess PC equipment. Service desk orders cabinets, fills them and sends them back to Arrow.
- *Premium support:* Microsoft – 3rd line Office365 support
- *NetNordic:* Telephone service provider. Service Desk forwards cases. NetNordic handles changes in the phone menu.
- *Print supplier:* Service Desk forwards cases.
- *Intercom Chat:* Service Provider of chat-function is contacted regarding the service.
- *Passord.nrk.no*: Service Provider of password function is contacted regarding the service.

3 CLIENT SERVICES

3.1 Overview

Currently the Client service includes setup and handling of mobile devices, PCs and Macs at NRK. There are several different categories of clients. Administrative clients for users with a need for Office-like workflows and clients for users with additional needs like developers and journalists that edit video, or work from anywhere and at any time. There are also advanced production clients for both live TV and Radio and heavy postproduction clients for VFX, coloring, etc.

Clients used for production (TV, Radio) have a higher level of customization, and error situations regarding these clients are handled with a higher priority. These clients need configuration and adaptation of production software, as well as testing of hardware and software in a production environment.

Clients services includes security setup of the clients, monitoring of clients as well as antivirus activity and responses to security incidents. Client services cooperate closely with Operational security.

3.2 Strategy

As for all services in NRK, the main priority is ultimately to give our audiences the best possible experience when consuming content or using services on NRK's different platforms.

Internal users should be put in the center of attention and given the best tools to perform their daily tasks. Client services should be as current as possible when it comes to operating systems, software versions and hardware models. This applies whether this is in an administrative office environment, or in the field where an employee is covering news – wherever in the world that might be. Delivering on this can be challenging in an organization like NRK with many different kinds of user scenarios and needs.

The following main factors in today's situation are identified to back up the strategy:
- Self-service
- A stable client platform
- Reliable onboarding and software deployment and the automation of this
- Patches
- Security

3.3 Offered Services

Note that the services included in this chapter describes services offered as part of the client service today. Modern technology and usage of standard services might result in new delivery models when the Contractor takes over these services.

3.3.1 Overview of current client service processes

The main processes associated with client services involve the life cycle management of computers and mobile phones. The processes include all steps from procurement to disposal of the hardware. The flow charts below illustrate the standard and current work flows. However, in practice there are exceptions from the standard flow. Note that these flow charts illustrate current work flows, the future work flows are dependent on the Contractor's response based on the needs and requirements described in appendix 1. As there are slight differences between the flows of the life cycle of machines at the HQ and Regional Offices this is illustrated in two flow charts. Macs are purchased individually for production or for individual administrative users.
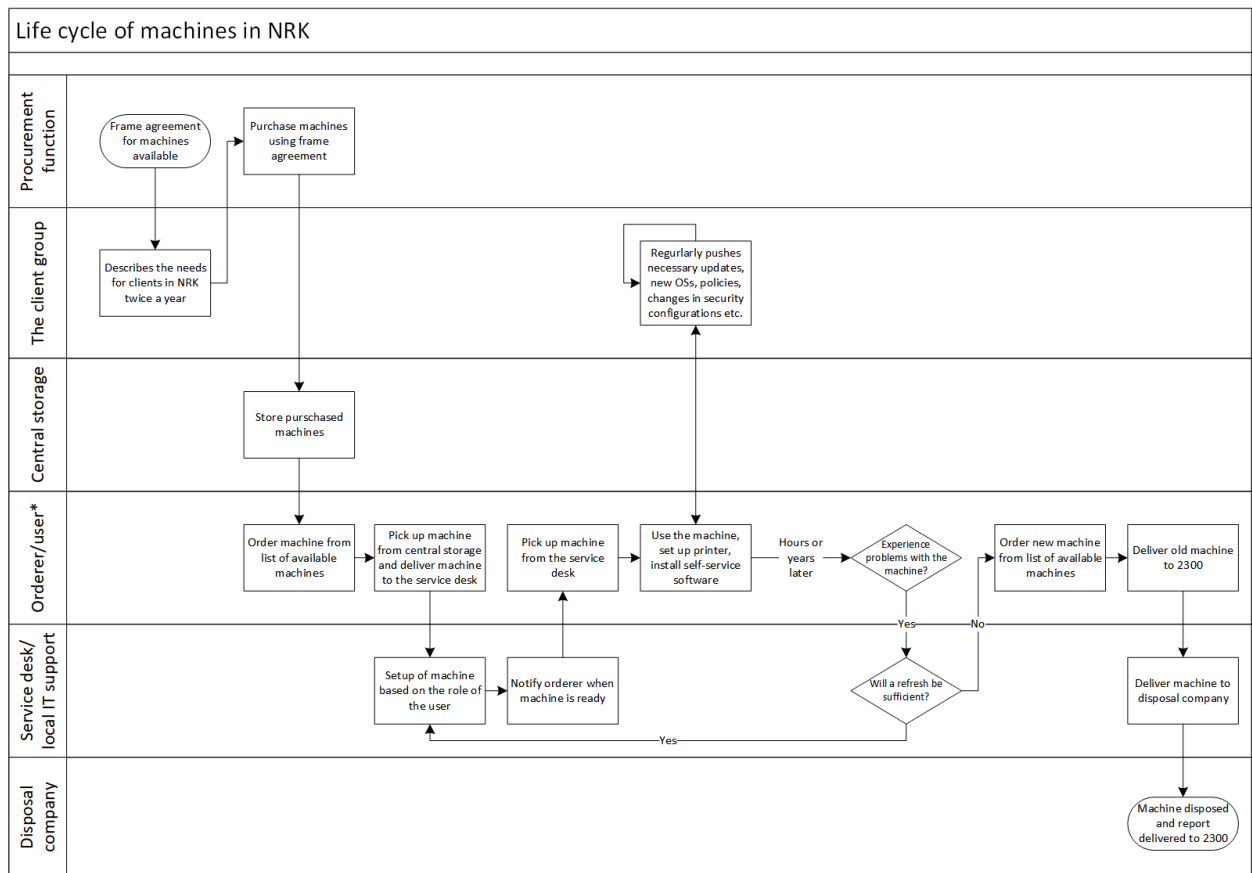
Life cycle of machines in NRK

Swimlanes and process steps:

Procurement function
- Frame agreement for machines available
- Purchase machines using frame agreement

The client group
- Describes the needs for clients in NRK twice a year
- Regurlarly pushes necessary updates, new OSs, policies, changes in security configurations etc.

Central storage
- Store purschased machines

Orderer/user*
- Order machine from list of available machines
- Pick up machine from central storage and deliver machine to the service desk
- Pick up machine from the service desk
- Use the machine, set up printer, install self-service software
- Hours or years later
- Experience problems with the machine? (Yes / No)
- Order new machine from list of available machines
- Deliver old machine to 2300

Service desk / local IT support
- Setup of machine based on the role of the user
- Notify orderer when machine is ready
- Will a refresh be sufficient? (Yes)
- Deliver machine to disposal company

Disposal company
- Machine disposed and report delivered to 2300

Figure 13: Flow chart of the current life cycle of the clients at NRK's HQ

*The "orderer" can be either the same person as the user of the client or a different person. E.g. when a new employee starts in NRK, the "orderer" and the user are different persons.

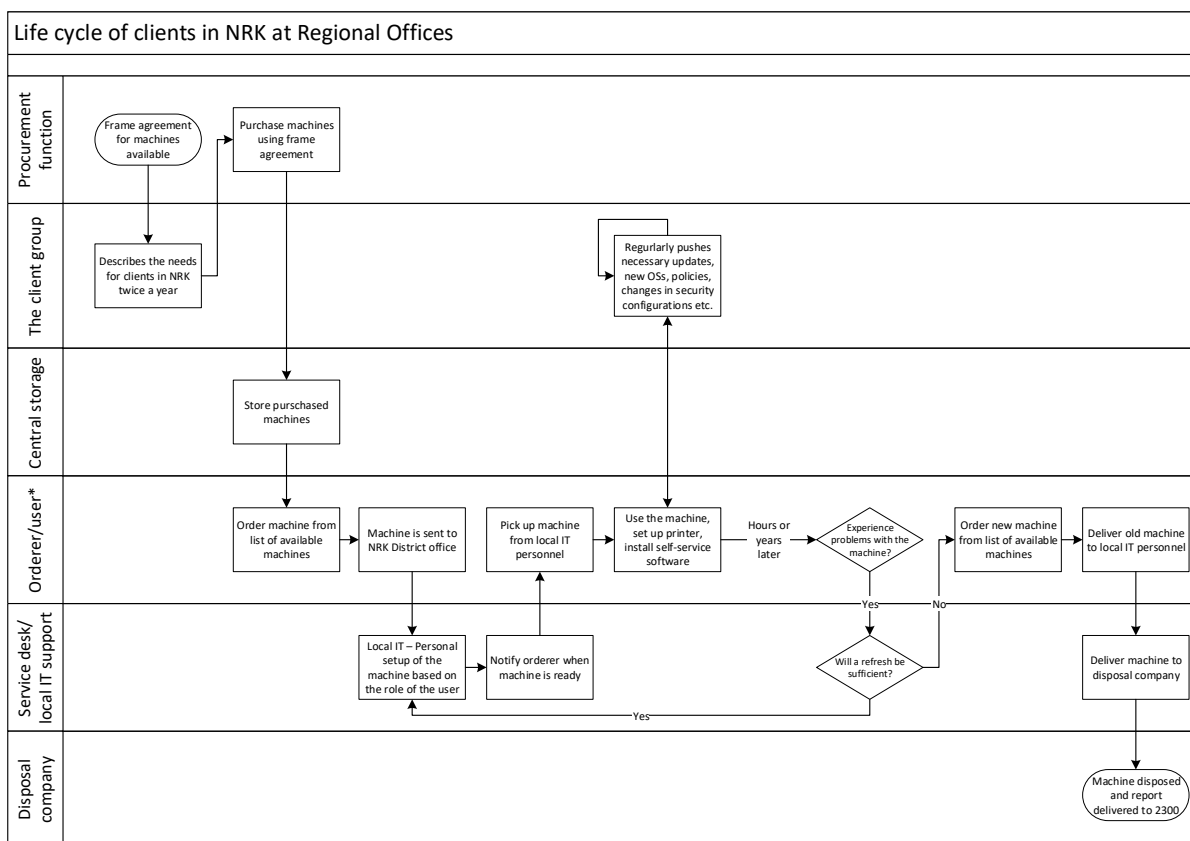**Life cycle of clients in NRK at Regional Offices**

Figure 14: Flow chart of the current life cycle of clients at the Regional Offices

There are no formal policies for the frequency for client replacement in NRK. As Illustrated in the flow chart above, the time for replacement of the machine depends on the user and whether the user experience any issues with the machine or if there is a requirement for change from a production standpoint. If the user experiences client problems that cannot be solved, the machine will be replaced. This means that there exist some clients in NRK that are very old (more than 7 years old), whereas most have a lifespan of 5-6 years. However, as NRK is aware of the risk associated with having old clients, some are replaced even though the user doesn't experience any issues. This is evaluated on a case to case basis, not based on formal policies. Moving forward NRK wants to standardize the machine park and implement a fixed client replacement frequency. See appendix 1 chapter 6.4 for further information about this.
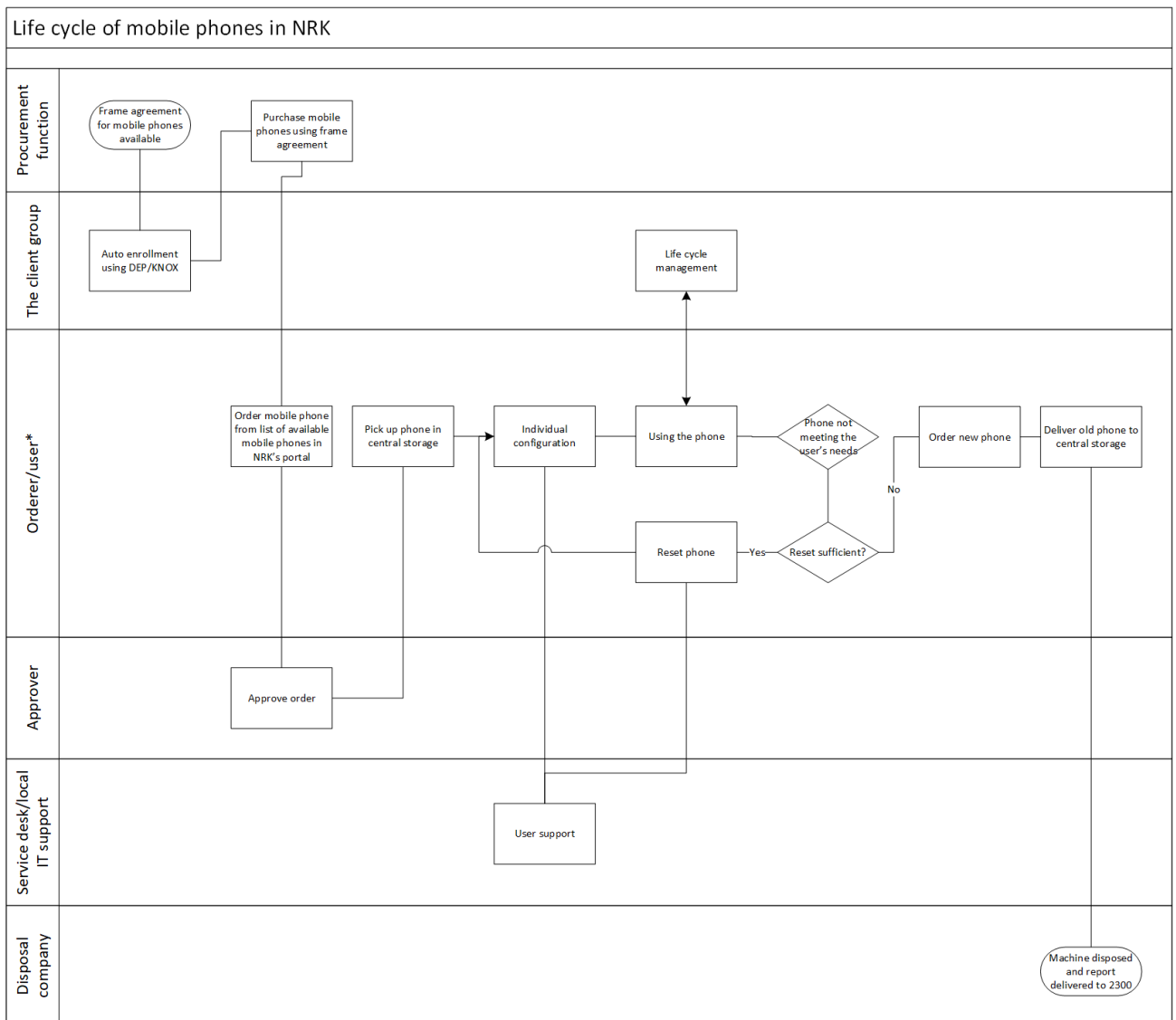
Life cycle of mobile phones in NRK

Figure 15: Flow chart of the current life cycle of mobile phones in NRK

As shown in the flow chart above, the "orderer"/end user orders a mobile phone from a list of available phones on NRK's portal. As soon as this has been approved (usually by the closest leader), the user can pick up the phone from NRK's central storage.

NRK owns the mobile devices and procures these using different frame agreements for mobile devices. Client services is responsible for the enrollment of the mobile devices. Apple devices are automatically enrolled the moment they are bought using the Apple Device Enrollment Program (DEP). Android devices are currently manually enrolled. The enrollment process means that the mobile devices are handled by NRK's MDM solution, where they get their basic setup, security policies and some basic applications. Client services handles the life cycle management of the mobile devices after enrollment.

3.3.2 Detailed description of the current client service tasks

Client services are responsible for several "layers" of the client-setup, illustrated in the figure below. Regularly new versions of every OS are implemented, or new version of a software, or new settings, while not necessarily changing any other parts of the stack. Client services aim to implement a modular design and making each layer (and every software) as effective as possible. This is done through thoroughly testing in a production environment and working closely with production. The most important difference between various NRK clients is that they have different roles. This is mostly seen as a difference in software and configuration, but there are some hardware differences as well, especially when it comes to high-end editing and postproduction. The goal is that the creative end user has a good user-experience and that they are as productive as possible. The experience is that this "layered" approach minimizes errors and avoid some big changes that are hard to bullet-proof.
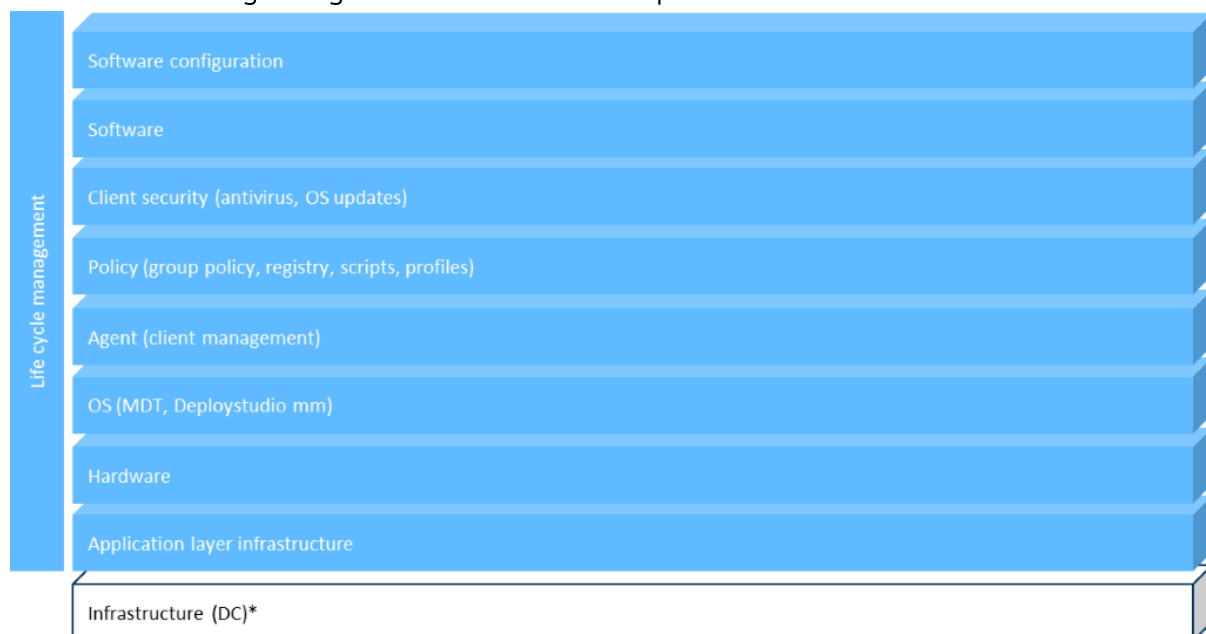

Figure 16: Layers of the current client services in NRK

The different layers in the figure are described below:

- **Infrastructure:** The physical servers and network. These servers might run services that are important for the client, such as software distribution, inventory and the setup of the client, but the physical/virtual servers and network are for the most part not handled by client services (up until now there have just been a couple of exceptions).
- **Application Layer Infrastructure:** The services layer, for example the software/tool running on the servers that make it possible to enroll and to give the clients a tool for software distribution. These services do for the most part give the clients their basic setup, the OS, some policies etc. It also collects inventory data, such as hardware information, software information, the usage of the software, who's logged in at the machine and more. MDT, DeployStudio, Lanrev and Filewave are examples of services NRK currently support and handle.

- **Hardware**: Ownership and procurement and disposal of physical machines (Macs, PCs, mobile devices).
- **OS**: Setup and operation of operating systems (e.g. MacOS, Windows, iOS, Android). Imaging, testing, implementation at NRK, and patching. Currently implementing Autopilot and DEP.
- **Client tool (client administration)**: Operation of tools that are installed on the client (e.g. Lanrev, Intune, Filewave). These tools are used for support, inventory and license monitoring, setup and software distribution. The main goal is that it is effective, fast, and reliable. Client services is responsible for setting up remote assistance/remote control on the clients, using tools such as Netop, or RDP om Windows and ARD on Macs. TeamViewer is now being considered for remote control-support of Mac, PCs and mobile devices.
- **Policy**: Setup of the client according to set policies. Accomplishing this includes use of GPO (Windows), Profiles (Mac, iOS, some Android), scripts (Mac and Windows) and registry (Windows).
-
- **Client Security**: See Figure 17 below illustrating todays interfaces between Client Services and the two internal groups, Operational Security Group and DISI. Some of the responsibilities of the Operational Security Group today are considered part of Client security and vice versa in the future. Installing and maintaining firewall-settings, patching software and OS, installing antivirus etc. NRK considers the following tasks part of client security in the future: Policies (GPO, Profiles, registry, scripts), Signature based security, Endpoint detection, Patching, Automatic incident handling, Reporting in ITSM tool, End to end encryption for communication, and Encryption.
- **Software**: Preparing and distributing software based on the role of the client, in addition to providing self-service software the end user can install without the need for IT-support and without administrator rights via a customizable "kiosk" on every client. There are several hundred software-packages at NRK. Software is distributed as msi, pkg, exe, scripts, filesets (filewave), etc. Production software have a higher priority than other software (for example Adobe, Final Cut Pro X, Digas, Quantel etc). The software layer is constantly changing, and is very much "alive" at NRK. Every software is continuously updated and adapted to NRK's requirements.
- **Software Configuration**: Customized configuration of some of the software to optimize workflows, and/or to give a better user experience.
- **Life cycle management**: Administration of the client during its lifetime in NRK. This includes for instance continuous improvement and renewal of the layers described above. Once or twice a year there is a roadmap/state of the union-meeting to summarize and plan ahead.
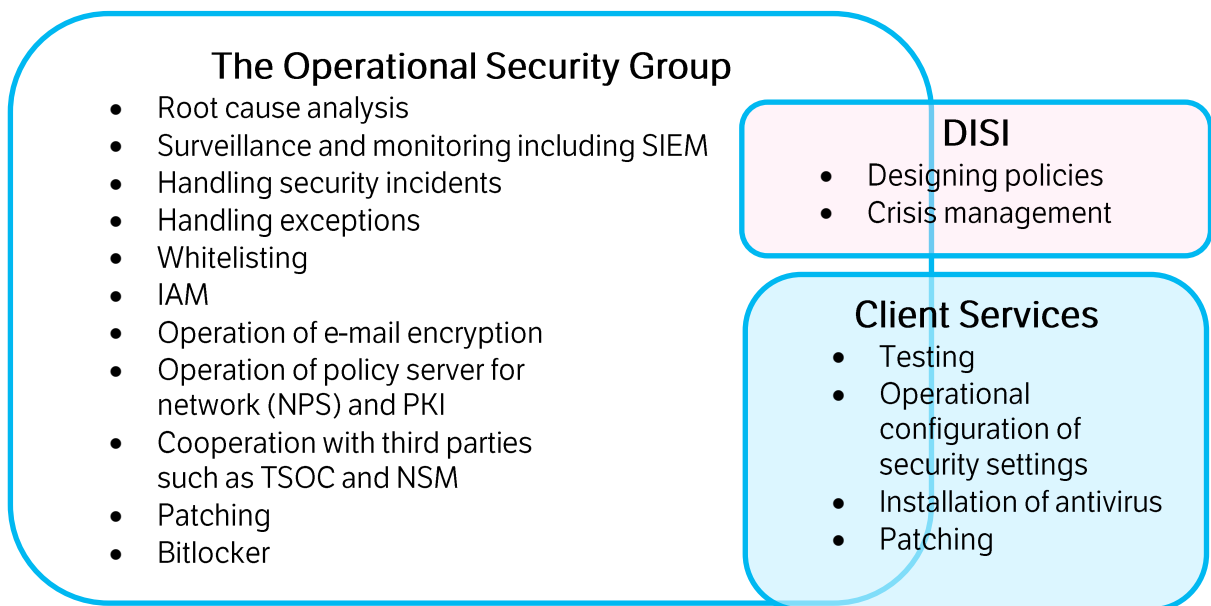
The Operational Security Group
- Root cause analysis
- Surveillance and monitoring including SIEM
- Handling security incidents
- Handling exceptions
- Whitelisting
- IAM
- Operation of e-mail encryption
- Operation of policy server for network (NPS) and PKI
- Cooperation with third parties such as TSOC and NSM
- Patching
- Bitlocker

DISI
- Designing policies
- Crisis management

Client Services
- Testing
- Operational configuration of security settings
- Installation of antivirus
- Patching

Figure 17: Illustration of current organization handling client security

3.3.3 Additional tasks

To be able to design clients optimized for the workflows is important. This is done in cooperation between different NRK production departments and the relevant Service Manager(s).

Client services are occasionally involved in customization of media production software when the out of the box experience isn't good enough. This includes thorough testing and adapting of software. It involves cooperation with production groups and service providers.

Client services facilitate local system administrators who on occasion are given access to clients in their environment in order to undertake some extra administration. Examples include installing software or supporting end users in case of special needs.

3.4 Users and service levels

3.4.1 Users

Including part time workers and consultants, a total of 4,500 people use NRK's Client services.

These users have different types of positions and work tasks and therefore different needs concerning Client services. As users have different needs depending on their work activities, various departments have several different kinds of clients. The aim is to meet the requirements of the users in an optimized manner and to customize the setup of the clients according to relevant needs. To achieve this, every department is treated as their own "shop" and is categorized one by one. However, for the most part, the users in NRK can be categorized into 3 types, as described in the figure below.

Figure 18: High-level overview of user categories in NRK

The users may fall into all these three categories depending on the work they perform at different times. Therefore, the number of users within the various types of roles is difficult to define. However, the actual clients/machines can be broadly grouped into these three categories. Note that there are more clients than users, as most users have more than one client.

- **Administrative**: NRK has about 3,400 administrative PC and Macs, mostly Office-based.
- **Developer, journalist, editing**: There are about 4,500 machines used for development, journalist related work tasks and smaller editing tasks.
- **Production/editing**: There are about 1,200 critical, or high-end production/editing machines.

The categories above apply to all clients, with the exception of mobile devices. There are about 3,000 mobile devices in NRK's MDM-system, with about 4100 registered as bought by NRK. As of today, all mobile devices are handled the same way and has limited SLAs. However, some mobile devices are used in conjunction with production and broadcasting. In these cases, the mobile devices are categorized as production equipment and apply to the same SLAs as equipment critical for production.

3.4.2 Handling of client incidents

The Client services work as 2nd or 3rd line of support and are mostly concerned with the overall design and maintenance of the services needed for the client (e.g. MDM/Filewave/Intune). The local support personnel and the Service Desk (2300) cover most support cases first. Operational groups do however in some cases perform direct support if there's a tight deadline or if there's obvious need for special expertise. Operational groups also have support channels to service providers, to discuss technical problems, various features and feature requests.

Regarding SLAs the clients are handled according to the definitions described in chapter 2.4. The actual use of the client defines the priority. This means that the same client may be handled as a noncritical incident when used for administrative tasks but handled as a critical incident when used for editing of media to be published.

3.5 Projects

The table below briefly describes the ongoing client related projects in NRK.

Table 8: Overview of ongoing projects related to client services

Project	Timeline	Description
Windows 10	Ongoing	Pre-projects Q3/Q4 2017, expected implementation 2019.
Client handling system	Ongoing	Replacement of Lanrev with Filewave
Moving home directory and shared directories to the cloud	Ongoing	SharePoint and OneDrive
Automatic enrollment of PCs	Ongoing	Intune and autopilot
Automatic enrollment of MACs	Ongoing	FileWave and device enrollment program (DEP)
Automatic enrollment of mobile devices	Ongoing	Intune, DEP and KNOX

3.6 Hardware and software

The following sub chapters describe hardware and software used in NRK today.

3.6.1 Hardware

The table below provides a high-level overview of the number of different categories of hardware in NRK. Note that the numbers in this table are approximate as it is difficult to categorize the different machines within administrative, developer/journalist and production and editing.

As indicated in the table below there is a gap between the number of mobile devices that are registered in NRK's management system and the numbers of mobile devices bought. There could be different reasons why mobile devices have not been registered in the management system.

Table 9: High-level overview of hardware in NRK

Category	Administrative clients		Developer/journalist clients		Production and editing clients		Total	
	Win.	Apple	Win.	Apple	Win.	Apple	Win.	Apple
Desktops	40%	0%	37%	12%	83%	17%	3800	700
Laptops	55%	5%	40%	11%	0%	0%	3700	650
Total	**3400**		**4500**		**1200**		**9100**	
Registered mobile devices/ tablets	NA						100 (Android)	2900
Bought mobile devices/tablets	NA						4100	
Gap							1100	

Please refer to *"Appendix 3 attachment 1 - Overview of client portfolio"* for a more detailed overview of the hardware.

3.6.2 Software

3.6.2.1 *Software used by the client group*
Client services use different tools and software to execute their tasks. The table below provides an overview of the main tools and software that are currently in use.

Table 10: Overview of current client service tools and software

Software/tool	Description	Comments
Lanrev	Inventory, license monitoring, software distribution, support of clients, MDM	End of life – will be replaced with Filewave
Filewave	Software distribution, inventory	Main tool for software distribution for Macs and PCs from 2019
Intune	MDM – mobile device management	Lanrev end of life – MDM replaced by Intune

MDT	Imaging for Windows	
DeployStudio	Imaging for Mac	Will be replaced with DEP spring 2019
Netop	Remote Control	Used for servers
RDP/ARD	Remote Control	Used by system administrators for clients
Teamviewer	Remote Control / support	Used for support /assistance
Symantec	Antivirus / monitoring	Client security

3.6.2.2   Software used by NRK employees

There are more than 300 software packages in use in NRK. Refer to "*Appendix 3 attachment 2 - Overview of software*" for a detailed list of the different software packages currently available. The list includes six columns:

- Software: What software does the software package include?
- Version: What version of the software does the software package include?
- Software package name: What is the name of the software package?
- Standard: Is the software rolled out to all machines in NRK or not? If not automatically rolled out to all machines, is the software available in the self-service kiosk?
- Media production: Is the software used specifically for media production or not?
- Comments

There are about 40 editorial environments at NRK, half of them located at the headquarter in Oslo. Each Regional Office is also treated as its own editorial environment. Some environments collaborate across several locations. Every environment is generally treated the same way, with some standard setup and software, and has categorized their clients in different roles based on their need for customization. For the most part clients are categorized into two main categories: "administrative" and "production", often called *editing*.

One of the editorial environment is for example called "*Documentary*", and has two types of roles that are covered by "administrative" and "production" clients. Most software and setup is standardized/the same. Some settings like printer-settings, some software and some kind of workflow tweaks that are special for the client roles in this editorial environment may be different.

Another editorial environment called "*Entertainment*" also has the same two client roles; "administrative" and "production", but these roles have a slightly different workflow than those in "*Documentary*". This kind of setup is standardized based on roles, but also to make it possible to add some minor customization. It also gives NRK a possibility to be flexible, and to update and do maintenance in a better way. Sometimes a suitable editorial environment is used to test a new version of for example an editing software. Such a setup makes it possible to test with a limited number of machines without affecting other environments.

There might be sub-roles in *production*, for example when there is a need for different setups between radio and TV. There will then be two *production-roles*, one called "Video production" and another called "Radio production". The actual designs are based on local needs and feedback from the environments.

Critical clients are handled manually case by case.

The clients get most software automatically, based on roles and which editorial environment they are enrolled into. There is in addition a self-service software kiosk available from every client where users can get software on-demand. When software is neither automatically installed based on role and editorial environment nor available from the self-service kiosk, it has to be installed manually. This is often handled by local IT staff as they know their environment, and as there might be special quirks and features with the software that requires hands-on treatment.

3.6.2.3   Collaboration systems

NRK has implemented Microsoft Office 365 as part of their collaboration systems/platform and uses One Drive for Business for personal home directory. The purpose of this service is to provide the employees with a standard service for authentication, e-mail services, storage of personal directory and provide access to services both within and outside NRK's network. NRK is in the process of implementing SharePoint Online as a standardised platform for collaboration services both internally and externally.

3.6.2.4   Active Directory / Azure AD and Office 365

NRK uses Active Directory and Azure AD for Clients, Users and Groups. NRK will set and own the policies for this area.

Exchange and Office 365 are completely cloud based and will be used by NRK for at least the next 3 years.

3.7   Interfaces with other functions

Client services cooperates closely with different functions. Some of these functions may in some cases have partly overlapping responsibilities. This requires a close and good cooperation between the client services and these functions. See Figure 19 for an illustration of the interfaces between the client services and other functions such as media production support, service desk, operations groups, IT personnel at Regional Offices and external partners.
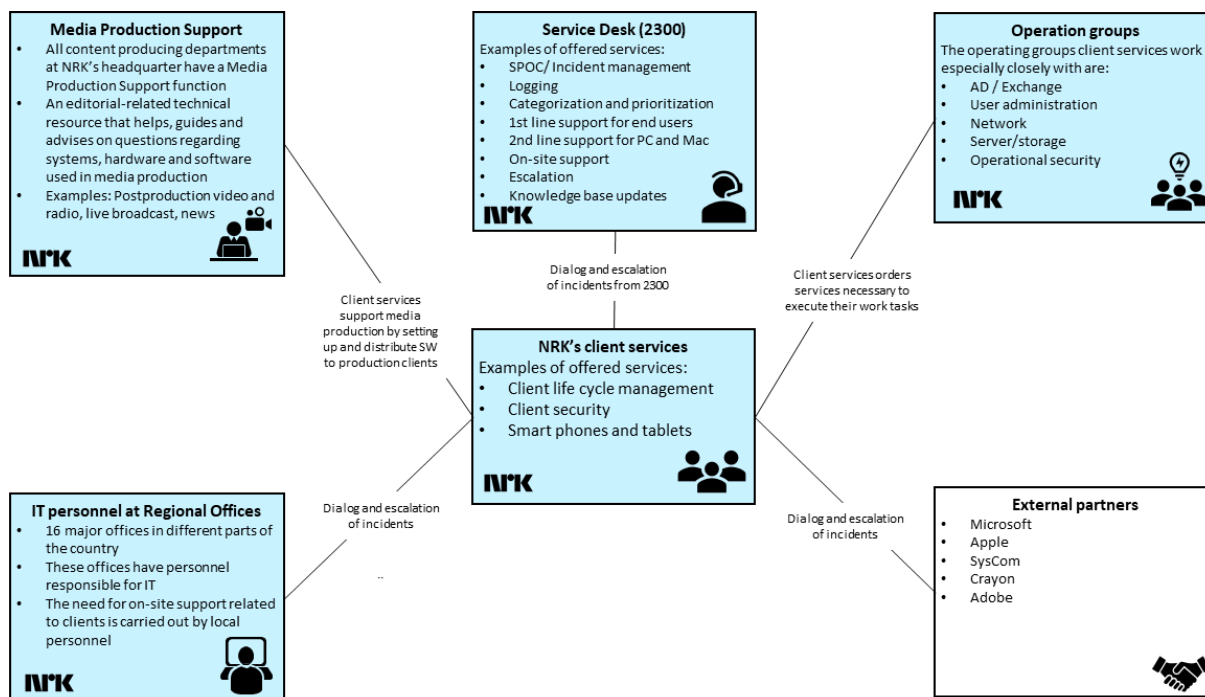
Figure 19: Interfaces between client services and other functions

4 ATTACHMENTS

Attachment	Description
Appendix 3 attachment 1 - Overview of client portfolio	Detailed overview of the current client portfolio in NRK, including all machines and mobile devices
Appendix 3 attachment 2 - Overview of software	Detailed list of the different software packages currently available in NRK. The list includes six columns: • Software: What software does the software package include? • Version: What version of the software does the software package include? • Software package name: What is the name of the software package? • Standard: Is the software rolled out to all machines in NRK or not? If not automatically rolled out to all machines, is the software available in the self-service kiosk? • Media production: Is the software used specifically for media production or not? • Comments