Please note that this document is a draft that might be subject to change.

1. Components

1.1 AAM Data

The AAM data delivery consists of three datasets; AAM Panelist file, AAM viewing file and AAM metadata file. The panelist file contains all possible panel viewers, their weights and sociodemographic variables. This file is also used to derive the universe sizes.

The viewing file contains viewing statements for Online video content at a panelist level, which allows for calculations of several different metrics including reach metrics.

The metadata file contains information about the titlecodes included in the viewing file, such as title name, date of publication, program length etc.

Data will initially we delivered weekly, with the viewing file containing all viewing statements for a complete week (Monday to Sunday). The aim is daily deliveries with one file per each viewing day, but this process requires further development at MMS.

The rules for how the AAM data should be used are described in section (2) of this document.

1.2 Objects of measurement

The smallest object of measurement is the titlecode which is a unique ID referring to a specific episode or clip within a Site. Calculations can be made over an aggregation of multiple titlecodes, for example a complete series or in total over a site.

The combination of SiteID and Titlecode is the unique key between the viewing file and metadata file.

Please note that different metrics requires different approaches when performing calculations across multiple titlecodes or viewing days. This will be described per each metric separately in section (2).

1.3 Calibration

The AAM data is based by a combination of panel measurement and traffic measurement (the MMS Census measurement). The model uses a calibration step to assure that the number of contacts and total sum of viewing time calculated by the panel should equal the result directly from the Census measurement. This calculation is performed by the combination of SiteID, titlecodes) and Viewing day.

Please observe that only objects (titlecodes) that are observed in the AAM panel can be calibrated against the census measurement. The object behind the AAM method is too create a big panel with great coverage, but there would still exist very small titles that

consequently have a small probability of being observed in the panel. For objects too small to be captured by the panel, hence there will be a discrepancy in comparison with the census traffic measurement.

1.4 Report types

The AAM data can be used for two different reporting types:

Viewing day reports – A viewing day is the day when the viewing was actually taken place. In this type of reports the metrics are calculated and reported per each viewing day in the selected time frame, regardless of when the content originally was published.

This type of report can be used to determine for top-lists as for example which programs had the most traffic or number of unique viewers during a specific day or week.

Consolidated reports- The base for consolidated reports are the publication day for when the specific content was published and hence made available for viewing. The metrics are then accumulated over the X number of viewing days following the date of publication.

The three standard consolidation periods are:

- ***KO8-*** Publication day + the 7 following viewing days.
- ***KO28-***Publication day + the following 27 viewing days.
- ***SoFar-*** Publication day + all following viewing days so far available in the measurement.

Consolidated reports are best used to for example analyze the sociodemographic profiles of the complete audience for a program, or to compare different programs based on an equivalent number of measured days.

1.5 Target modules

The sociodemographic information available today are combinations of gender and age brackets. There is a total of 18 possible target modules that can be combined into desired target group constellations.

2. Calculation of metrics

2.1 Number of contacts

Number of contacts is defined as the total number of non-unique contacts made during a specific time period. The calculation can be made for a specific titlecode or aggregated over a selection of multiple titlecodes. The results can also be aggregated freely over a longer time period.

Per the viewing days (d) and Titlecodes (t) that matches the selection, the number of contacts are calculated according to the formula:

$$Number\ of\ contacts_{d,t} = \sum_{v=1}^{V}(c_v * w_p * cf_v)$$

Where:
V= Total number of relevant viewing statements **v** in AAM viewing file.
c= Number of uncalibrated contacts for viewing statement **v**.
w= Weight for panelist **p** belonging to viewing statement **v**.
cf= Contacts calibration factor for viewing statement **v**.

Calculation across multiple titlecodes

The results per each combination of titlecode and viewing day separately can be summarized into the desired aggregation of multiple titlecodes.

Viewing days d1-d11

		d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11
Titlecodes t1 & t2	t1	1000	888	23	0	13	556	33	22	21	2	57
	t2			2987	456	1028	332	35	276	18	100	224

The total number of contacts on viewing day d3 for t1+t2= 3010

Calculation across multiple viewing days

A viewing report can contain the aggregated number of contacts for a longer *viewing period* by summarizing the results from each viewing day.

Viewing days d1-d11

		d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11
Titlecodes t1 & t2	t1	1000	888	23	0	13	556	33	22	21	2	57
	t2			2987	456	1028	332	35	276	18	100	224

The total number of contacts for t1+t2 during viewing period (d3-d7)=5463

Consolidated results

The consolidated number of contacts equals the aggregated number of contacts for the publication date and the X following viewing days (the 7 following viewing days for KO8).

Assume d1 and d3 as publication dates for t1 and t2 respectively in the below example:

Viewing days d1-d11

	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11
t1	1000	888	23	0	13	556	33	22	21	2	57
t2			2987	456	1028	332	35	276	18	100	224

Titlecodes t1 & t2

The consolidated number of contacts for t1+t2 consists of the aggregated number of contacts for viewing days d1-d8 for titlecode t1 and d3-d10 for titlecode t2.

2.2 Total viewing-time

Total viewing time is defined as the total aggregated duration of all contacts. The calculation can be made for a specific titlecode or aggregated over a selection of multiple titlecodes. The results can also be aggregated freely over a longer time period.

$$Total\ viewing\ time_{D,t} = \sum_{v=1}^{V}(d_v * w_p * df_v)$$

Where:
V= Total number of viewing statements **v** in AAM viewing file.
d= Viewing time duration for viewing statement **v**.
w= Weight for panelist **p** belonging to viewing statement **v**.
df= Duration calibration factor for viewing statement **v.**

The formula above calculates the total viewing time in seconds. When reporting total viewing-time, the result should be rounded to number of hours.

Viewing days d1-d11

	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11
t1	48000	41820	1020	0	420	14799	1320	780	600	60	2820
t2			75510	20700	44955	10936	855	5355	270	3915	6930

Titlecodes t1 & t2

Total viewing-time in seconds for titlecode 2 on viewing day d3 is 75510. This gives 21 hours.

Calculation across multiple titlecodes

The results per each combination of titlecode and viewing day separately can be

summarized into the desired aggregation of multiple titlecodes.

Calculation across multiple viewing days
A viewing report can contain the aggregated total viewing time for a longer *viewing period* by summarizing the results from each separate viewing day.

Consolidated results
The consolidated number of contacts equals the aggregated total viewing time for the publication date and the X following viewing days (the 7 following viewing days for KO8).

The logic for calculating total viewing time across multiple titlecodes and/or viewing days is equivalent to the approach for number of contacts. See section (2.1) for more detailed illustration of the scenarios.

2.3 Onlinerating

Onlinerating is defined as the average number of viewers per second during the length of a program. Onlinerating is a non-unique measure of the program's audience size, where the intensity of viewing time has been considered.

The onlinerating per each combination of titlecode(t) and viewing day (d) is calculated as:

$$Onlinerating_{d,t} = \frac{\sum_{v=1}^{V}(d_v * w_p * df_v)}{L_t} = \frac{Total\ viewing\ time_{d,t}}{L_t}$$

Where:
L= Program length for titlecode **t.**

The numerator of the formula above equals the calculation of total viewing time in section (2.2).

Viewing days d1-d11

		d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11
Titlecodes t1 & t2	t1	48000	41820	1020	0	420	14799	1320	780	600	60	2820
	t2			75510	20700	44955	10936	855	5355	270	3915	6930

The base for the calculation of onlinerating is the total viewing time calculated exactly as in (2.2).

Assume program length 60 seconds and 45 seconds for titlecodes t1 and t2 respectively in below example:

Viewing days d1-d11

		d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11
Titlecodes t1 & t2	t1	800	697	17	0	7	245	22	13	10	1	47
	t2			1678	697	999	243	19	119	6	87	154

The onlinerating for t2 on viewing day d3 will be: (75510/45)=1678.

Onlinerating across multiple titlecodes

The onlinerating should always be calculated per each specific titlecode separately and is not aggregatable across multiple titlecodes.

The onlinerating for multiple titlecodes, for example a complete series, should instead be calculated as the average onlinerating across the selected titlecodes:

$$Onlinerating_{d,(t1+t2...+tT)} = \frac{\sum_{t=1}^{T}(Onlinerating_{d,t})}{T}$$

Where:
T= Number of unique titlecodes included in the selection.

Viewing days d1-d11

	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11
t1	800	697	17	0	7	245	22	13	10	1	47
t2			1678	345	999	243	19	119	6	87	154

Titlecodes t1 & t2

The average onlinerating for the two titlecodes t1+t2 on viewing day d3 is (17+1678)/2=847,5 (848).

Consolidated Onlinerating

To calculate the consolidated onlinerating, the total viewing time in seconds needs to be calculated according to (2.2) for each viewing day included in the consolidation period. Then the aggregated total viewing time across the consolidation period should be divided with the length of the program.

$$Onlinerating_{(d1+d2+...+dD),t} = \frac{\sum_{d=1}^{D}(Onlinerating_{d,t})}{L_t}$$

Where:
D= Number of days included in the consolidation period.
L= Program length for titlecode **t.**

Viewing days d1-d11

	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11
t1	48000	41820	1020	0	420	14799	1320	780	600	60	2820
t2			75510	20700	44955	10936	855	5355	270	3915	6930

Titlecodes t1 & t2

The consolidated (KO8) onlinerating for titlecode is
t2=(75510+20700+44955+10936+855+5355+270+3915)/45=3197

2.3 Reach within a single viewing day

This metric calculates the number of unique individuals viewing a title or groups of titles each day. The object of measurement can be a specific titlecode, or a group of titlecodes belonging to for example a series or a complete Site.

For a titlecode (t) or a group of selected titlecodes (T) the absolute reach per each viewing-day (d) are to be calculated as:

$$Absoulte\ reach\ (single\ day)_{d,(t1,t2\ldots tT)} = \sum_{p=1}^{P} w_p * D_{p,v}$$

$$D_{p,v} = \begin{cases} 1, & \text{if first matching } v \text{ for panelist } p \\ 0, & \text{else} \end{cases}$$

Where:
P= Total number of panel-members in selected target-module(-s).
w= Weight for panelist **p.**
v= Viewing statement for panelist **p** that matches the selection criteria.
D= A 'dummy'-variable that indicates if the panel-members viewing statement **v** should be considered in the reach calculation or not. Each individual panelist should only be counted once, regardless the number of times the panelist has viewed any titlecode in the selection.

The accumulated sum of weights of unique panel-members could then to be divided with the universe size of the current target-modules(-s*)* in order to calculate the relative reach:

$$Relative\ reach\ (single\ day)_{M,d,T} = \frac{Absolute\ reach\ (single\ day)_{M,d,T}}{U_M}$$

Where:

U= The aggregation of universe sizes for all relevant target-modules **M**.

Reach criterion
The reach calculation can be combined with a reach criterion stating that the panelist needs to have been viewing for at least X continuous seconds/minutes to be included. The reach criterion should be based on the column Duration in the viewing file. For the absolute reach formula in 2.3 this means that the 'dummy'-varible **D** should be set to 1 only for the first viewing statement of each panelist **p** where the duration is equal to or longer than the specified reach criterion.

Calculation across multiple titlecodes
Reaches for separate titlecodes cannot be aggregated with each other. The reach calculation should always be performed directly on the complete selection of unique titlecodes.

Calculation across multiple viewing days
For calculating reach across a period of multiple viewing days, see section (2.6).

Calculation of consolidated reach requires a reach calculation across several viewing days, which will be further specified in section (2.6).

2.4 Average viewing-time per start

Average viewing-time per start is a calculation of the time spent on average per start of the content measured. Average viewing-time is calculated by dividing total viewing-time (2.2) with total number of contacts (2.1) for the specific selection of titles and time period.

$$Average\ viewing\ time\ per\ start = \frac{Total\ viewing\ time}{Number\ of\ contacts}$$

2.5 Average viewing-time per viewer

This metric calculates the average viewing-time per the number of unique individuals who have watched the content measured. Average viewing-time per viewer is calculated by dividing total viewing-time (2.2) with the absolute reach of unique individuals (2.3)

$$Average\ viewing\ time\ per\ viewer = \frac{Total\ viewing\ time}{Absolute\ reach}$$

2.6 Average viewing-time in population

The average viewing-time can also be calculated in relation to the size of the population (as a whole or as a specific target-group). This definition is equivalent to the one used for calculating average viewing time in MMS TV audience measurement. When comparing average viewing-time between online video and broadcast TV, this is the definition to be used.

$$Average\ viewing\ time\ in\ population = \frac{Total\ viewing\ time}{U_M}$$

Where:

U= The aggregation of universe sizes for all relevant target-modules ***M***.

2.6 Reach across multiple viewing days

This section refers to calculation of unique viewers over a period covering several different TV-days.

In this kind of calculation, a certain *panel-day* should be used. The official recommendation is to use the middle-day of the selected period as the panel-day.

Example: The selected period for the RoF-analysis is 20190101-20190107. In this case 20180104 will be used as the panel-day.

In case of an even number of days in the selected period, the highest of the two middle-days should be used as the panel-day.

Example: The selected period for the RoF-analysis is 20180101-20180108. In this case 20180105 will be used as the panel-day.

The starting point of the calculation is all possible panelist, including their weights, from the AAM panelist-file belonging to the panel-day. Only this set of panelists and their viewing during the selected viewing-period are to be considered in the reach calculation. Any viewing made by a panelist not belonging to the panel-day should not be included in the calculation.

For each panelist belonging to the panel-day, all viewing statements for all viewing-days in the selected period should be used to determine whether the panelist should be counted for in the reach calculation or not.

Every panelist should only be counted once, regardless if they have multiple viewing statements during the period that meets the specific selection criteria.

$$Absoulte\ reach\ (multiple\ days)_{(d1,d2...dT),(t1,t2...tT)} = \sum_{p=1}^{P} pw_p * D_{p,v}$$

$$D_{p,v} = \begin{cases} 1, & \text{if first matching } v \text{ for panelist } p \\ 0, & \text{else} \end{cases}$$

Where:
P= Total number of possible panelists belonging to the panel-day, according to the AAM Panelist file.
pw= Weight for panelist ***p*** on the panel-day, according to the AAM Panelist file.
v= Viewing statement for panelist ***p*** that matches the selection criteria.
D= A 'dummy'-variable that indicates if the panel-members viewing statement ***v*** should be considered in the reach calculation or not. Each individual panelist should only be counted once, regardless the number of times the panelist has viewed any titlecode in the selection.

Reach criterion
The reach calculation can be combined with a reach criterion in the same way as for reach within a single day (2.3).
The 'dummy'-variable ***D*** in formula above should then be set to 1 only for the first viewing statement of panelist ***p*** during the viewing period, where the Duration is equal to or longer than the specified reach criterion.

Consolidated results
Consolidated reach is per definition a calculation of reach across multiple viewing days. The consolidated reach (KO8) for a TitleCode covers a period of 8 viewing days (Publication day+ the 7 following viewing days).

Since the viewing period consists of an even number of viewing days, the panel-day should be the latest of the two "middle days" of the period.

Example:

A TitleCode was published at 20190401. For calculation of consolidated reach, the viewing period of 20190401-20190408 are to be considered for the possible panelist and their weights belonging to panel-day 20190405.

Cumulative reach over time

The reach calculation can be used to display the growth of additional reached individuals day by day for a selection of Titlecode(s) and viewing period.

The viewing statements for each included panelist needs to be ordered by viewing-day in ascending order before determining the 'dummy'-variable *D,* to make sure the panelist is counted for only his or hers first day of viewing during the period.

When summarizing the panelists weight *pw* where *D=1* grouped by each viewing day in the selected period, the result will then show the number of additional reached individuals that did not view the content any of the previous viewing days.

Calculation across multiple titlecodes

Reaches for separate titlecodes cannot be aggregated with each other, since possible individuals who have watched more than one of the titlecodes will be duplicated. The reach calculation should always be performed directly on the complete selection of unique titlecodes.

The results can be reported as the growth of additional reached individuals per each titlecode during a selected viewing period (for example per each episode in a series).

The approach to follow is the same as for cumulative reach over time, but the results are group per titlecode instead.