gemalto

# Business booster
# Optimize OTA Campaigns

## Campaign fine tuning – eXpress Campaign Technology *(XCT)*

# Summary

✦ Parameters involve in XCT campaign tuning

✦ Fine tuning of XCT parameters

✦ Fine tuning XCT Campaign parameters

# Parameters involved in XCT campaign tuning Overview

A lot of parameters are involved in the campaign tuning

✦ Some of them are known only by YOU
   ➔ **Operator knowledge**
   ➔ Operator information
   It's up to **you** to **gather** these **parameters**

✦ Some of them are set by Gemalto but can be fine tuned
   ➔ Gemalto settings. Can be fine tuned
   You will be able to **verify** and **fine tune** these **parameters**
   You **can** contact **Gemalto Support for confirmation**

✦ Some of them are set by Gemalto but need to be verified
   ➔ Gemalto settings to be verified
   You will be able to **verify** and **fine tune** these **parameters** but
   you have to **GET GEMALTO SUPPORT AGREEMENT**

# Parameters involved in XCT campaign tuning

**XCT product parameters**
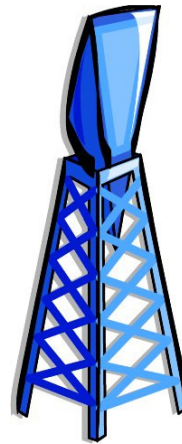• Parameters / Flow control

**Driver.ini**
• Flow control sleep

**Knowledge of the subscriber's behaviors**
• Percentage of subscriber not under coverage

**Campaign parameters**
• Scheduling
✓Validity period
✓Grace period
✓Grace period for POR
✓Max number of retry
✓Retry delay

**SMSC parameters**
• SMSC bandwidth in sms/s
• Retry table
• Validity Period max

*Operator knowledge*
*Operator's information*
*Gemalto settings to be verified*
*Gemalto settings. Can be fine tuned by operator*

# Parameters involved in XCT campaign tuning

## Defined in the
## Campaign parameters sheet



*(See previous slides)*

**SMSC parameters**
- SMSC bandwidth in sms/s
- Retry table
- Validity Period max

**Knowledge of the subscriber's behaviors**
- Percentage of subscriber not under coverage

*Operator knowledge*
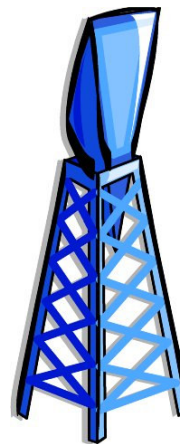*Operator's information*
*Gemalto settings to be verified*
*Gemalto settings. Can be fine tuned by operator*

# Parameters involved in XCT campaign tuning

**XCT product parameters**
• Parameters / Flow control

**Driver.ini**
• Flow control sleep



**Campaign parameters**
• **Scheduling**
✓Validity period
✓Grace period
✓Grace period for POR
✓Max number of retry
✓Retry delay

Defined in the
**Campaign fine tuning sheet**



*(See coming slides...)*

# Summary

✦ Parameters involve in XCT campaign tuning

✦ Fine tuning of XCT parameter

✦ Fine tuning XCT Campaign parameters

Parameters involved in XCT campaign tuning

**XCT product parameters**
• Parameters / Flow control

**Driver.ini**
• Flow control sleep

**Knowledge of the subscriber's behaviors**
• Percentage of subscriber not under coverage

**Campaign parameters**
• **Scheduling**
✓Validity period
✓Grace period
✓Grace period for POR
✓Max number of retry
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**SMSC parameters**
• SMSC bandwidth in sms/s
• Retry table
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*Operator knowledge*
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*Gemalto settings. Can be fine tuned by operator*
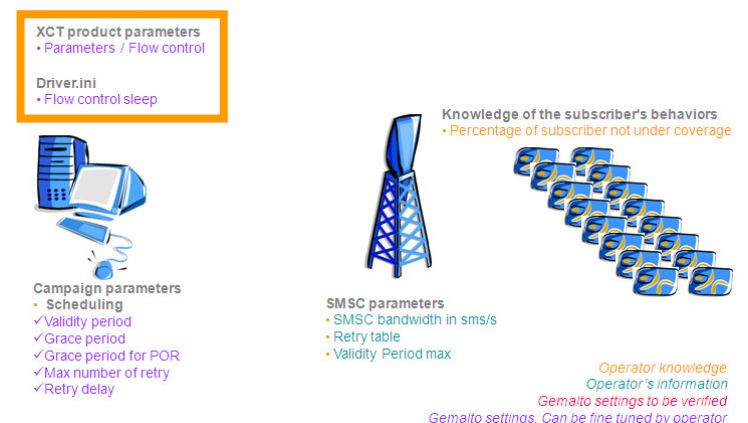
# Fine tuning XCT parameters
# Flow control – SMSC buffer size for XCT campaign
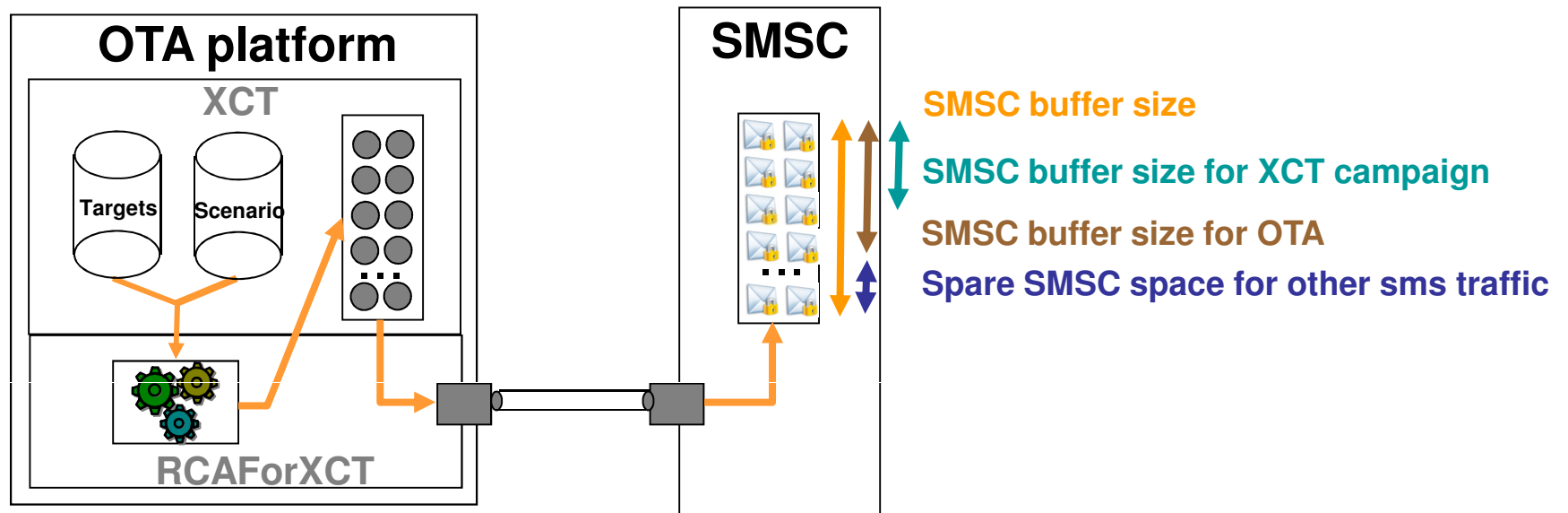


**SMSC buffer size for XCT campaign**

Number of **sms DUE TO XCT CAMPAIGN** that can be **store** into the **SMSC** during (max) the **validity period of services**

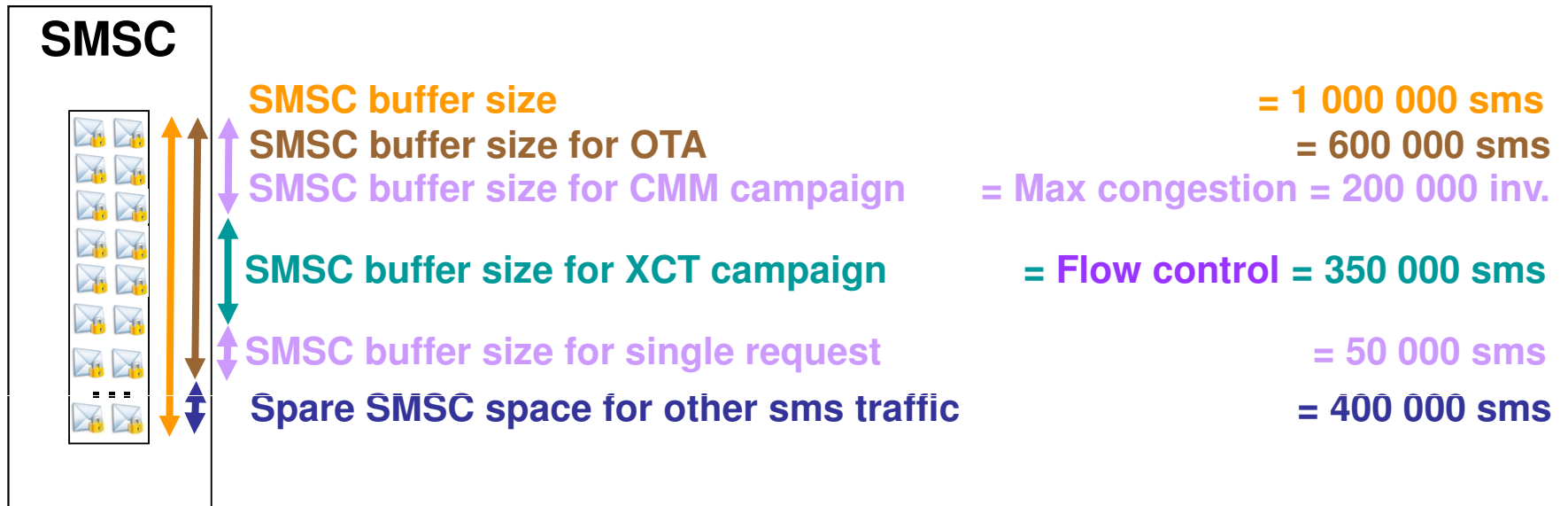➔ **SMSC buffer size for XCT campaign** < **SMSC buffer size for OTA** *(-10% at least)*

➔ **SMSC buffer size for OTA** > **SMSC buffer size for XCT campaign** **+ SMSC buffer size for CMM campaign** **+ SMSC buffer size for single request, ...**

# Fine tuning XCT parameters
# Flow control

**SMSC**

| | |
|---|---|
| **SMSC buffer size** | **= 1 000 000 sms** |
| **SMSC buffer size for OTA** | **= 600 000 sms** |
| **SMSC buffer size for CMM campaign** | **= Max congestion = 200 000 inv.** |
| **SMSC buffer size for XCT campaign** | **= Flow control = 350 000 sms** |
| **SMSC buffer size for single request** | **= 50 000 sms** |
| **Spare SMSC space for other sms traffic** | **= 400 000 sms** |

**Flow control** is maximum number of sms being sent
*(It's the equivalent of the Max congestion parameter for CMM campaign)*

➔ Adapt **Buffer size** according to your uses cases

# Fine tuning XCT parameters
# Flow control - Warning

**Flow control** is set by Gemalto during the integration phase.

As this parameter is linked to your use cases and SMSC capabilities (Allocated space for XCT campaign), you can fine tune this parameter. Gemalto support can check with you new values.

**Risks**

✦ If **Flow control** parameter **too high** regarding your SMSC capabilities
**SMSC** will have a **storage problem**, will **trash some sms**, will be **out of order**, ...

✦ If **Flow control** parameter is **too low** regarding your SMSC capabilities
You will **limit** the **sms submission bandwidth**

# Fine tuning XCT parameters
# Flow control - CCI access

**In order to reach XCT parameters**

# Fine tuning XCT parameters
# Flow control - CCI access

# Fine tuning XCT parameters
# Flow control - CCI access



**Take note of the current values**

Then, fine tune parameter

**Updated values are taken after having stopped/re-started XCT product**

# XCT Campaign with too low Flow Control value

✦ Modify Flow Control parameter of XCT to 1 000

✦ Launch XCT campaign
  - Scenario: Send 1 SMS
  - 10 000 Targets
  - 70% on coverage with 3s delay and 30% Out Of Coverage
  - VP= 10mn
  - Grace period = 0
  - Grace period for PoR = 0

What happens?
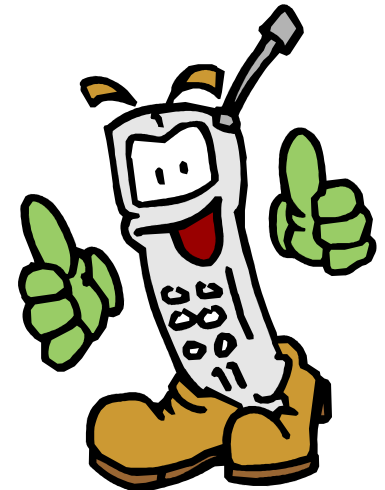
# XCT Campaign with too low Flow Control value Results 1/2



Flow Control has been reached, wait until VP expires and free space.

Here planning was empty
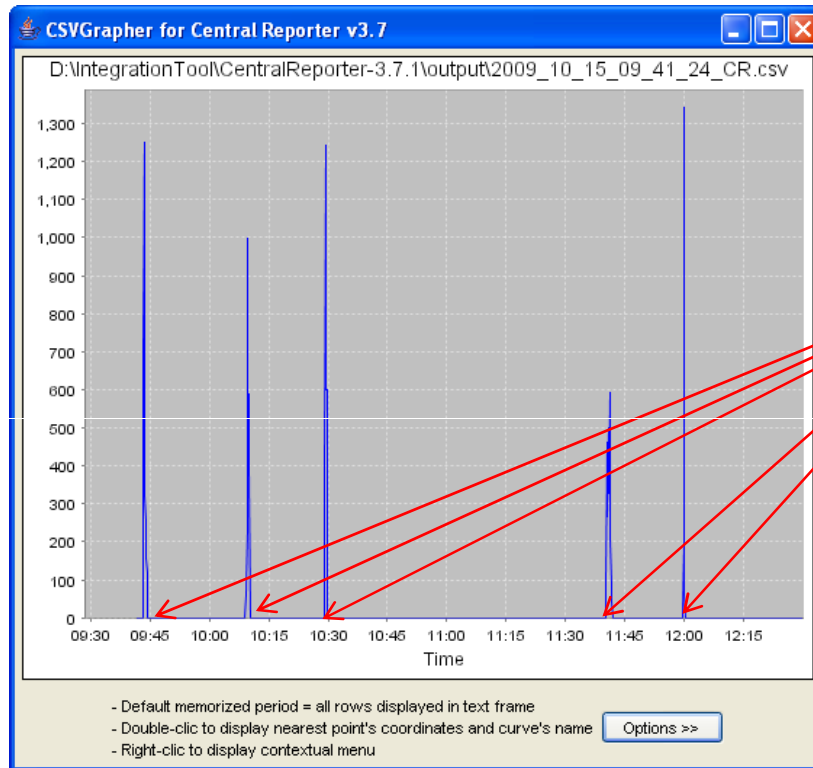
# XCT Campaign with too low Flow Control value Results 2/2

Campaign has been however corectly executed, because VP starts only when XCT sends SMS, not when SMS are processed.
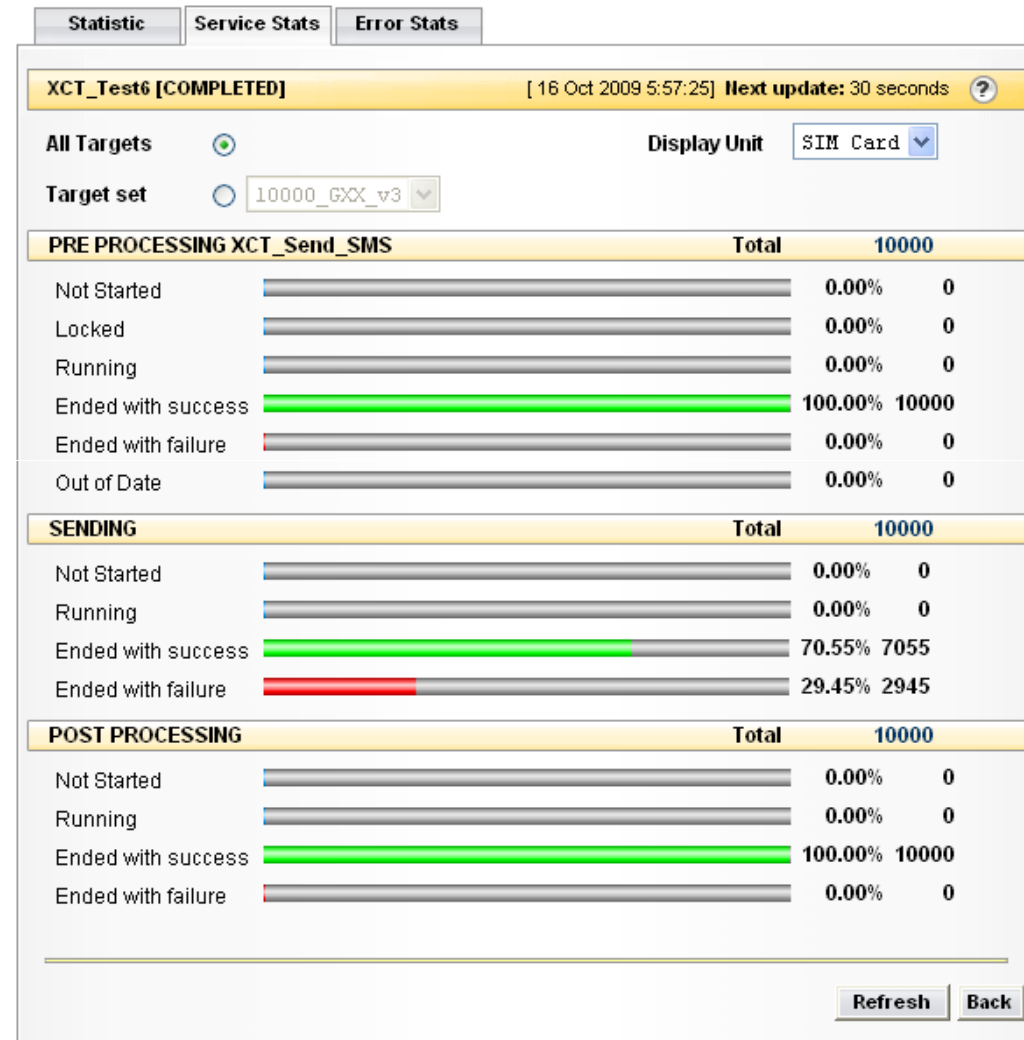
# Fine tuning XCT parameters
# Flow control sleep to limit XCT output
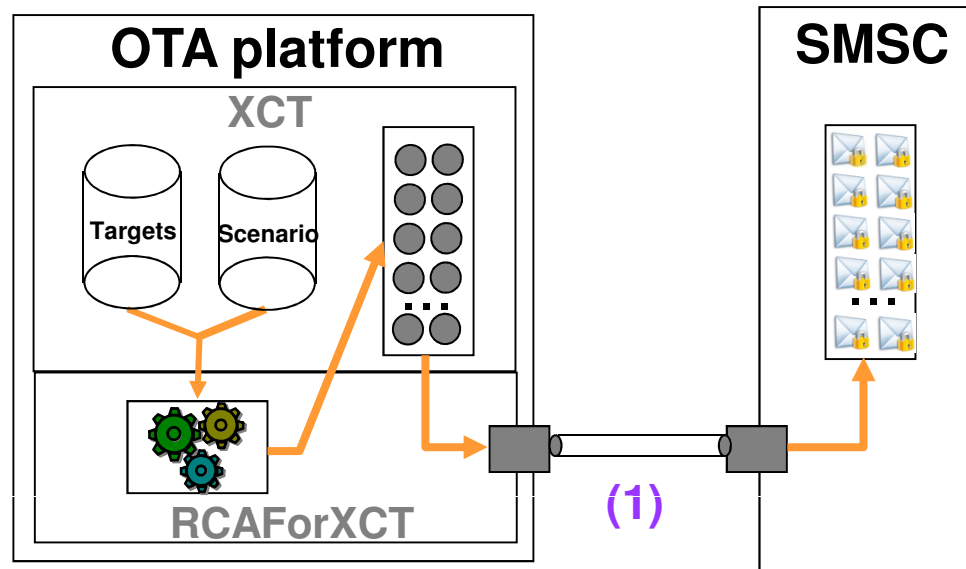


**(1) Bandwidth**

**Maximum number of invocations sent by XCT to SMSC every seconds**

**XCT flow** must **not be greater** than the **authorized SMSC bandwidth.**

**Careful: XCT flow can be up to**
- **1 000 SMS/s with SS7 connections**
- **up to 150 (even more) with SMSC connections**

# Fine tuning XCT parameters
## Flow control sleep to limit XCT output

✦ Create a drivers.ini file under /product/ota/XCT/PlugIn/drivers, with:

[PRODUCT *XCT_Name*]
[DRIVER1]
flow_control_sleep=*time (in ms) between sending two SMS messages.*

✦ **For example:**

  ✦ flow_control_sleep= 50 means a throughput of around 20SMS/second.

  ✦ If not set: no throughput limit (flow control sleep is 0 ms)

  ✦ If set:

    ✦ minimum: 20

    ✦ maximum: 200

✦ Stop/restart XCT to take into account this drivers.ini file

✦ Launch your XCT campaign

# XCT Campaign without Flow_Control_Sleep

✦ Launch XCT campaign

- Scenario: Send 1 SMS
- 10 000 Targets
- 70% on coverage with 3s delay and 30% Out Of Coverage
- VP= 10mn

What happens?
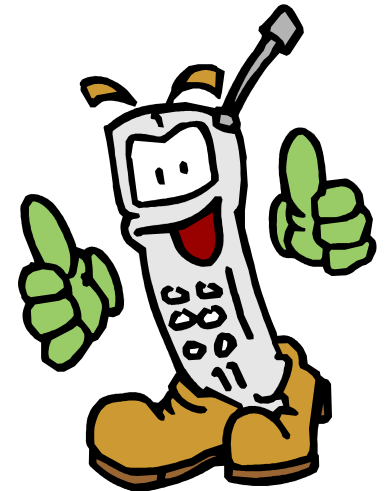
# XCT Campaign with Flow_Control_Sleep

✦ Create a drivers.ini file under /product/ota/XCT/PlugIn/drivers:

> [PRODUCT XCT_1]
> [DRIVER1]
> flow_control_sleep=50

✦ Stop/restart XCT to take into account this drivers.ini file

✦ Launch XCT campaign

- Scenario: Send 1 SMS
- 10 000 Targets
- 70% on coverage with 3s delay and 30% Out Of Coverage
- VP= 10mn

What happens?
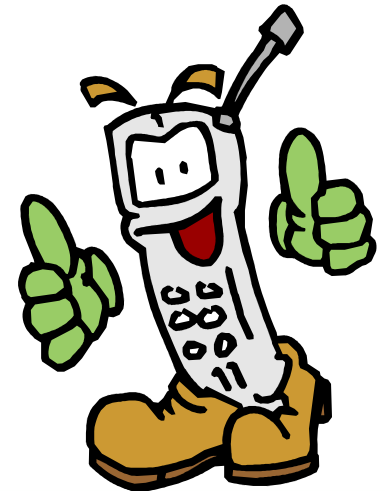
# XCT Campaign with/without Flow_Control_Sleep Results
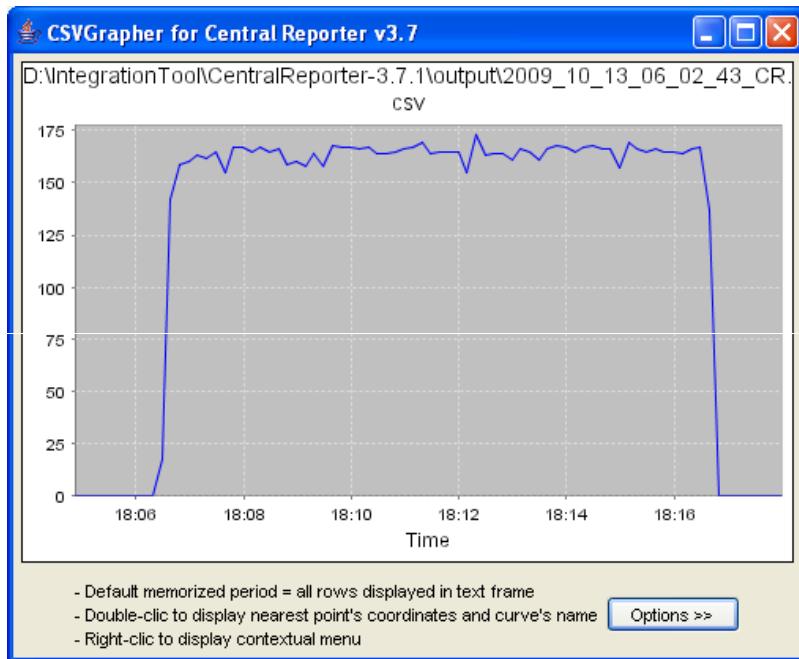


XCT Campaign with
Flow_control_sleep=50
Output flow regular
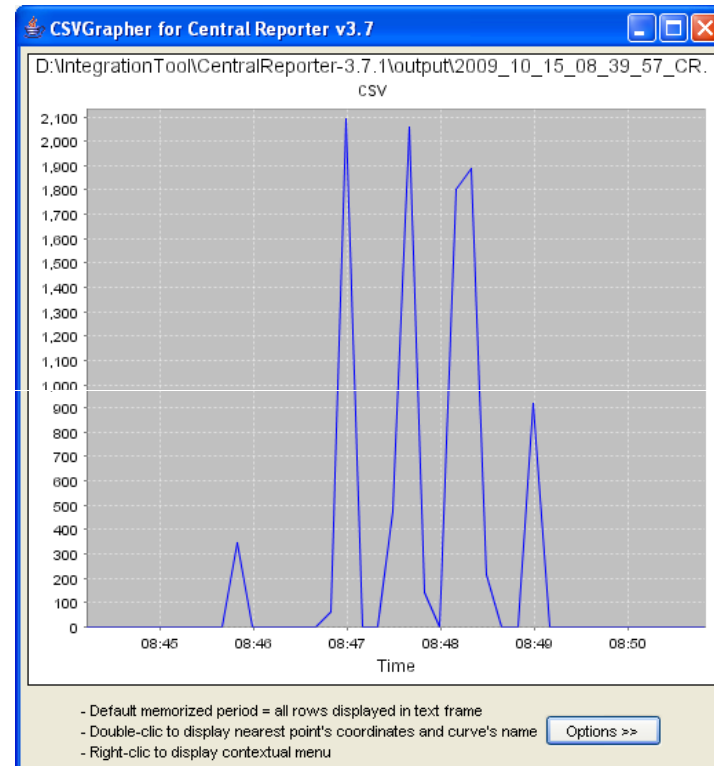
XCT Campaign with no
Flow_control_sleep
Output flow irregular

# Summary

- ✦ Parameters involve in XCT campaign tuning
- ✦ Fine tuning of XCT parameter
- ✦ Fine tuning XCT Campaign parameters

Parameters involved in XCT campaign tuning

XCT product parameters
• Parameters / Flow control

Driver.ini
• Flow control sleep

Knowledge of the subscriber's behaviors
• Percentage of subscriber not under coverage

Campaign parameters
• **Scheduling**
  ✓ Validity period
  ✓ Grace period
  ✓ Grace period for POR
  ✓ Max number of retry
  ✓ Retry delay

SMSC parameters
• SMSC bandwidth in sms/s
• Retry table
• Validity Period max

*Operator knowledge*
*Operator's information*
*Gemalto settings to be verified*
*Gemalto settings. Can be fine tuned by operator*
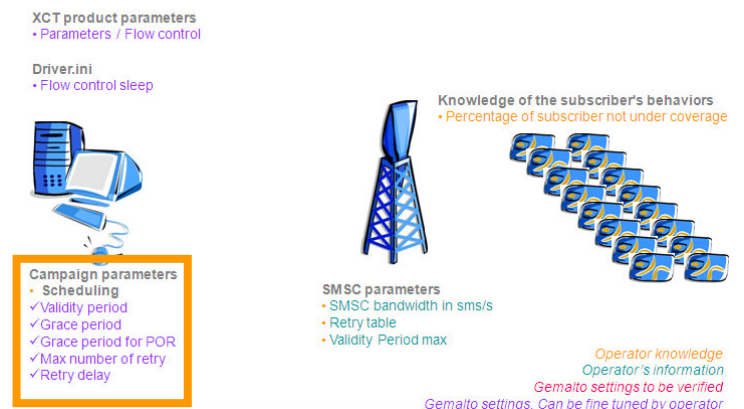
# Fine tuning XCT campaign parameters
# Validity period - Overview

✦ The **Validity Period** setting is crucial, as it determines the **success rate of a campaign**

✦ The **Validity Period is passed to the SMSC**, which sends the SMS messages during the entire **Validity Period** according to the SMSC retry scheme

✦ The **Validity Period** is **set** to an **sms**: If the service execution generate more than one sms, **each sms** have the **same Validity Period BUT START ONLY when SMS is SENT**

✦ OTA platform manage **relative** XCT **Validity period**
➔ Time zone are ignored

# Fine tuning XCT campaign parameters
## Validity period



| | Coverage zone | Out of coverage zone |
|---|---|---|
| | DS | |
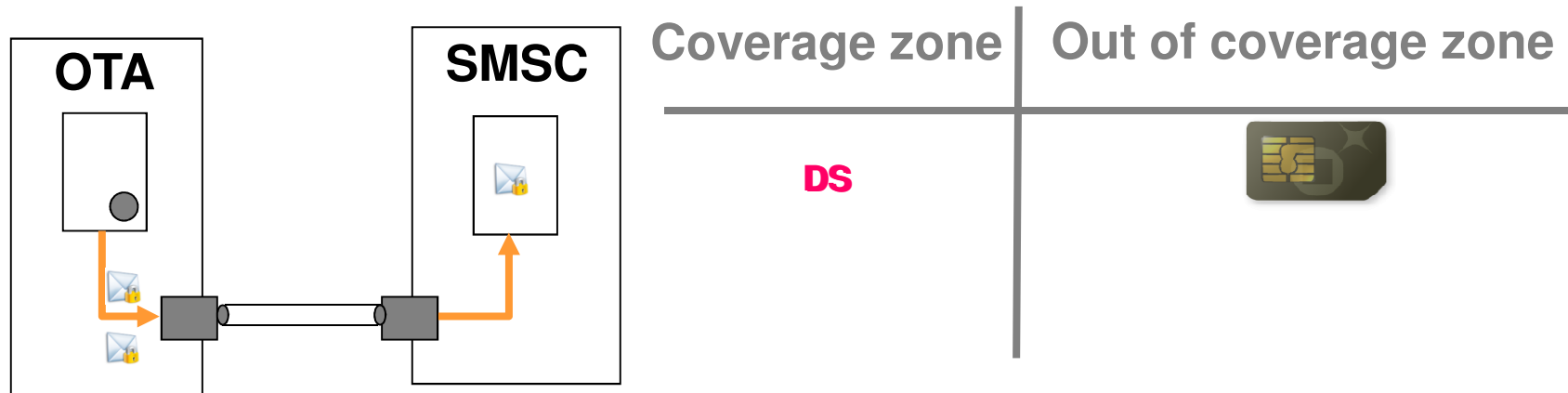
❶ When Invocation is treated, several sms can be generated by the OTA platform. The **Validity period** of **all of these sms** are the **same** and **start to decrease once SENT**.

❷ Then, **first sms** is **sent to SMSC** which tried to **sent it** to the **targeted card**. **This sms** can **stay** into the **SMSC** during all of the **Validity Period**.

❸ If **targeted card appears** into the GSM network, **and if the Validity Period of this sms hasn't be reached**, the **second sms** is sent to the **SMSC. This second sms** can **stay** into the **SMSC** during all of the **Validity Period**.

❹ **Service execution** will be "**succeeded**" if **the last sms** has been **successfully acknowledged** by the card **before reaching its own Validity period**.

# Fine tuning XCT campaign parameters
## Validity period – Restrictions & Advices

✦ OTA **Validity Period** <= **SMSC Maximum Validity Period**
*(If not, sms VP = SMSC Max VP)*

✦ **Probability** that **cards out of coverage** from many hours **become active before end of Validity Period** is very **low**:

% card successfully targeted

During this period, sms are stored into your SMSC and **only few sms** will be **successfully executed before the end of VP**!



70%
60%

12h          24h          Time
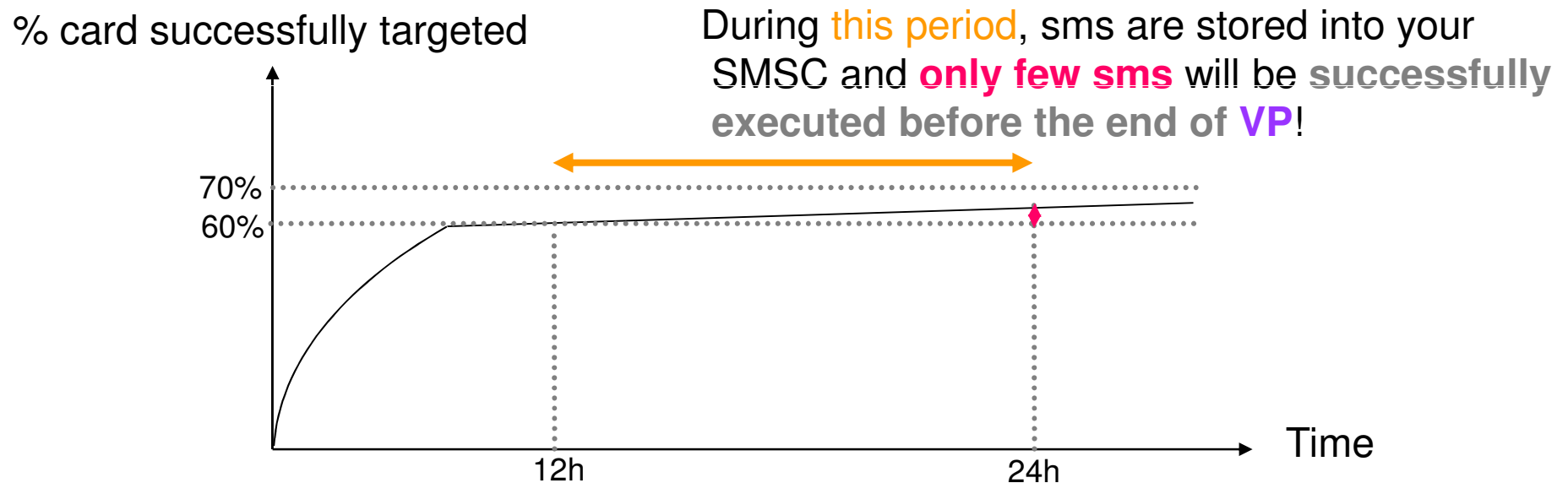
➔ **Recommended average value: VP ≈ From 8h up to 16h**

# Fine tuning XCT campaign parameters
# Validity period – Warning 1/3

**Validity Period** is set by you during campaign creation.
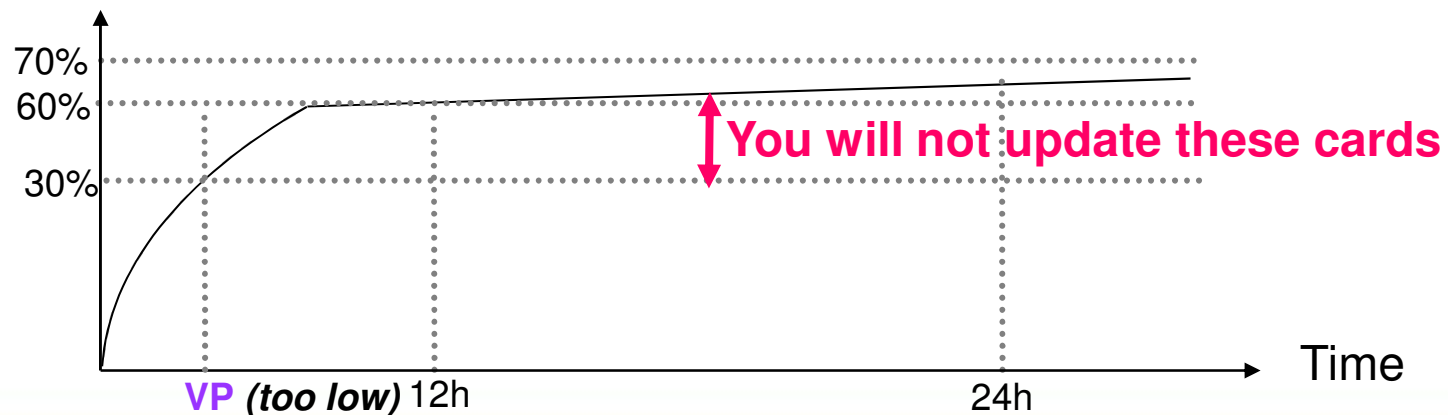
As this parameter is linked to your use cases (Number of sms per invocations), you can fine tune this parameter. Gemalto support can check with you new values.

**Risks**

✦ If **Validity Period** is **too short**
You will miss some cards!

% card successfully targeted



**You will not update these cards**

70%
60%
30%

VP *(too low)* 12h          24h          Time

# Fine tuning XCT campaign parameters
# Validity period – Warning 2/3

**Risks (Continue)**

✦ If **Validity Period** is **too long**
You can **saturate** your **SMSC buffer** and so, not optimize campaign
execution...

**Example**

✦ **Flow control**          = 500 000 sms

✦ **Targeted cards**       = 200 000

✦ Invocations            = 4sms

✦ % out of coverage cards  = 30%

➔ Total number of sms send by OTA to SMSC
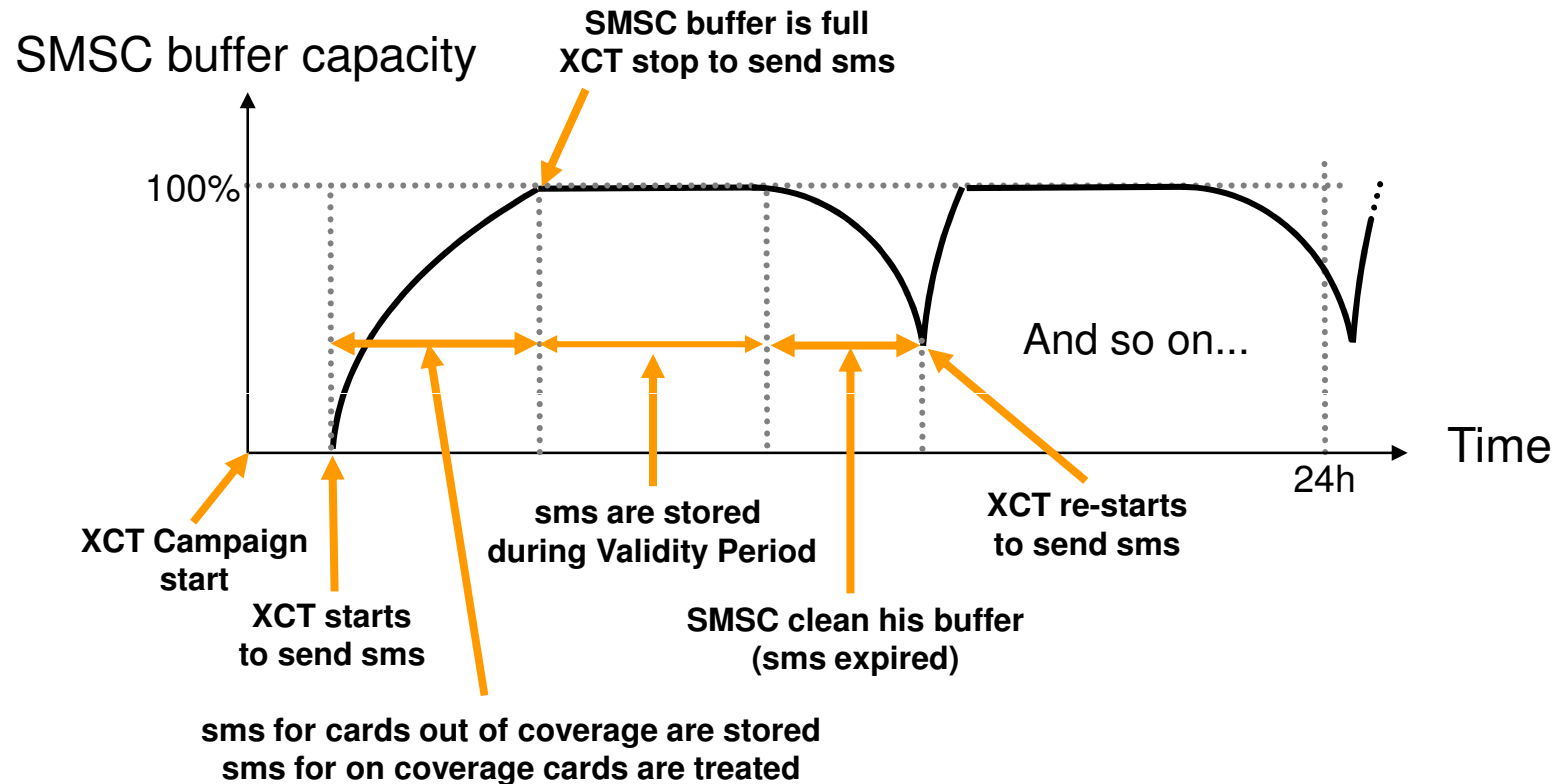
=

=

**These sms** can be taken into account by SMSC if buffer is not full...

**These sms** will stayed into SMSC buffer during **Validity Period**

# Fine tuning campaign parameters
# Validity period – Warning 3/3

SMSC buffer capacity

**SMSC buffer is full**
**XCT stop to send sms**

100%

And so on...

Time

24h

**XCT re-starts**
**to send sms**

**XCT Campaign**
**start**

**sms are stored**
**during Validity Period**

**XCT starts**
**to send sms**

**SMSC clean his buffer**
**(sms expired)**

**sms for cards out of coverage are stored**
**sms for on coverage cards are treated**

➔ **In order to help you to fine tune your Validity Period,**
**you can use our XCT fine tuning tool (See in the coming slides)**

# Fine tuning XCT campaign parameters
# CCI access – Validity period 1/2

**XCT parameters need to be setting up when you create a new campaign (Campaign Manager / Create a campaign / New)**



**Create a new campaign - XCT parameters definition**

| Validity period | 0 days | 0 hours | 10 minutes | 0 seconds |
| Grace period | 3600 | seconds |
| Grace period for PoR | 900 | seconds |
| Maximum number of retries | 0 | times |
| Retry delay | 3600 | seconds |

Back   Next

*Recommended configuration for Validity period: Between 8h and 16h*

# Fine tuning XCT campaign parameters
# CCI access – Validity period 2/2

The value you enter in the **Validity Period** boxes **is rounded** as follows:

✦ For values less than  12 hours                          to the nearest 5 minutes
✦ For values between   12 hours and 1 day      to the nearest 30 minutes
✦ For values between   1 day and 30 days        to the nearest 1 day
✦ For values between   30 days and 63 weeks to the nearest 1 week

All validity period processing is performed during the Sending phase.

# Fine tuning XCT campaign parameters
# CCI access - Grace period

| Create a new campaign - XCT parameters definition | | | | | | ⑦ |
|---|---|---|---|---|---|---|
| Validity period | 0 days | 0 hours | 10 minutes | 0 seconds | | |
| Grace period | 3600 | seconds | | | | |
| Grace period for PoR | 900 | seconds | | | | |
| Maximum number of retries | 0 | times | | | | |
| Retry delay | 3600 | seconds | | | | |

Back  Next

Specifies the **SMSC expiration time**, after which an **invocation** is **discarded** if it has **not** been **delivered** to the **destination** (❹).

**Grace period** is the time that **XCT waits** for a **Delivery Status** (❺) response message **after the validity period** has **expired** before **assigning a final status** code to an invocation *(Recommended value: 10mn).*

❶ OTA platform → ESMS → SMSC
❷ SMSC ACK → OTA platform
❸ SMSC → ESMS → ME
❹ ME → Delivery Status → SMSC
❺ SMSC → Delivery Status → OTA platform
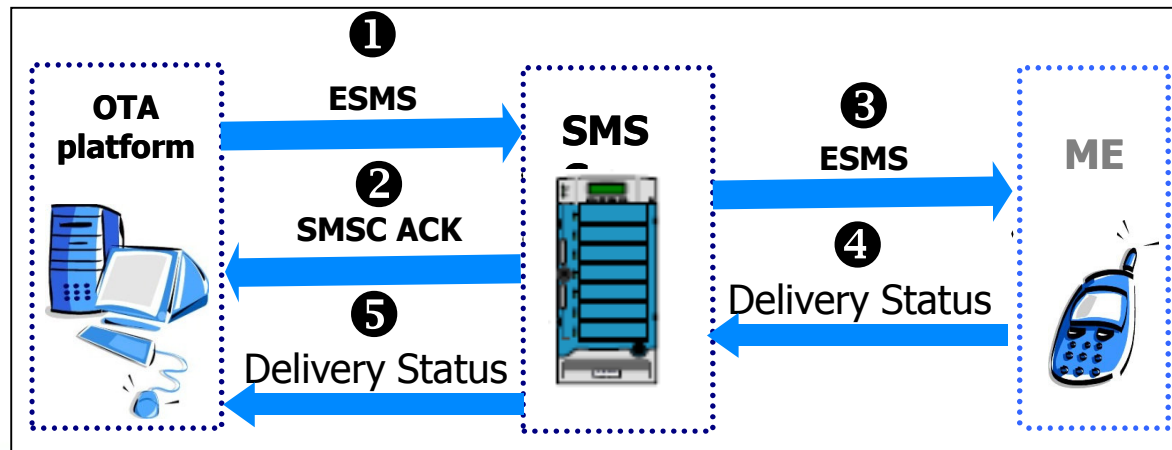
# Fine tuning XCT campaign parameters
# CCI access - Grace period for POR

**Create a new campaign - XCT parameters definition** ⊘

| | | | | | |
|---|---|---|---|---|---|
| Validity period | 0 days | 0 hours | 10 minutes | 0 seconds | |
| Grace period | 3600 | seconds | | | |
| Grace period for PoR | 900 | seconds | | | |
| Maximum number of retries | 0 | times | | | |
| Retry delay | 3600 | seconds | | | |

Back  Next

**Grace Period for PoR** is the period of time to **wait after expiration** of the **validity period** for a **PoR** (❼) to **arrive before** assigning a **final status code** to **the invocation.** *(Recommended value in SMSC mode: 10mn).*
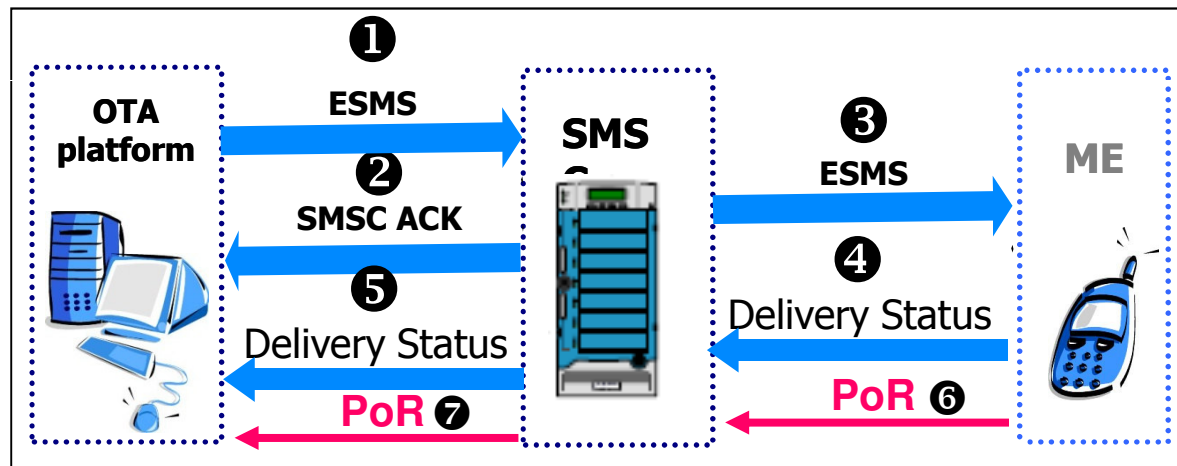
**Delivery Status (DS):** *Send by the card at the end of the reception of each SMS*
**Proof of Receipt (PoR):** *Send by the card at the end of each service execution*

# Fine tuning campaign parameters
# Retries policy

✦ **Retries** must be **in line** with the **Validity Period**

　　*(Ex: Most of cards are under GSM coverage during day, ...)*

✦ **Retries** can be **managed by**

- **OTA platform**
  - Maximum number of retries
  - Retry delay

- **SMSC** (Retry table)

  SMSC manages retires according to values setting up into its retry table
  Ex: sms is sent immediately then, retry after 5mn, 1h, 4h, ...

➜ Prefer to use **SMSC retry functionality**

# Fine tuning campaign parameters
# Retries policy – Example N°1

✦ Context

- Invocation = 1 sms
- VP = 8h
- Grace period & Grace period for POR = 10mn
- Targeted cards = 200 000 cards
- Out of coverage = 30%
- OTA SMSC flow = 20 sms/s

✦ Retries policy

- Use case A
  – OTA: Number of retry = 3
  – Retry delay = 2h
  – SMSC: Retry = 5mn, 1h, 4h & 8h
- Use case B
  – OTA: Number of retry = 0
  – SMSC: Retry = 5mn, 1h, 4h & 8h

➜ How many sms, due to this campaign, can be stored into SMSC?
➜ How long these sms will stay into SMSC?
➜ Maximum of campaign duration?

# Fine tuning campaign parameters
# Retries policy – Example N°1 solution

| | | | | |
|---|---|---|---|---|
| *Invocation* | *1 sms* | | *OTA SMSC flow* | *20 sms/s* |
| *VP* | *8h* | | *Number of retry* | *3* |
| *Grace periods* | *10mn* | | *Retry delay* | *2h* |
| *Targeted cards* | *200 000 cards* | | | |
| *Out of coverage* | *30%* | | | |

✦ How many sms due to this campaign, can be stored into the SMSC?
Max stored sms =

✦ How long these sms will stay into SMSC?
   ▪ Use case A *(With OTA and SMSC retries)*
      **sms will be stored during** **= 28h30**
   ▪ Use case B *(With no OTA retry)*
      **sms will be stored during**

✦ Maximum of the campaign duration?
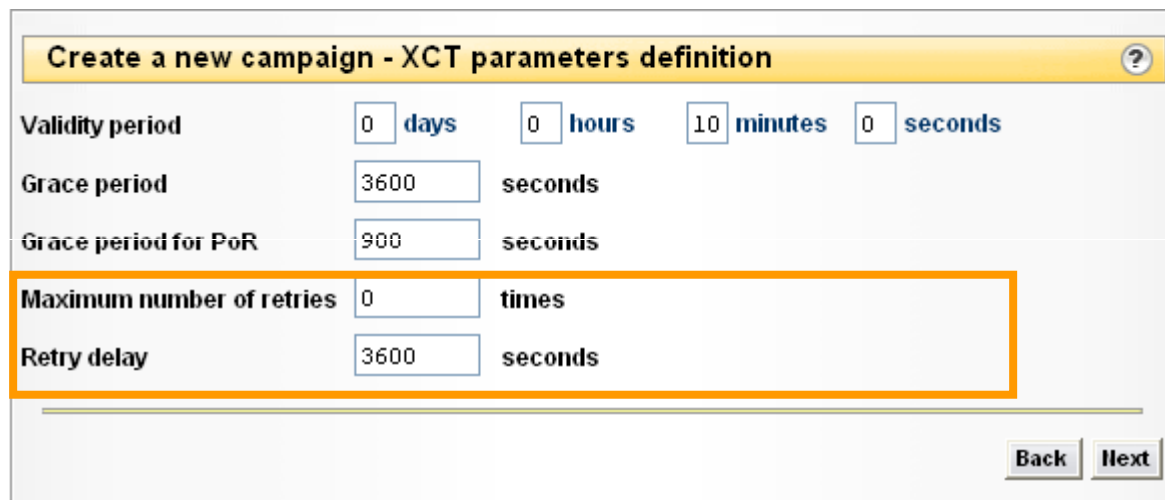   ▪ Use case A
      Campaign duration = h30
   ▪ Use case B
      Campaign duration =

# Fine tuning campaign parameters
# Retries policy – Example N°2

✦ Context

- Invocation = 4 sms
- VP = 8h
- Grace period & Grace period for POR = 10mn
- Targeted cards = 200 000 cards
- Out of coverage = 30%
- Max Throughput = 20 sms/s

✦ Retries policy

- Use case A
    - OTA: Number of retry = 3
    - Retry delay = 2h
    - SMSC: Retry = 5mn, 1h, 4h & 8h
- Use case B
    - OTA: Number of retry = 0
    - SMSC: Retry = 5mn, 1h, 4h & 8h

➜ How many sms, due to this campaign, can be stored into SMSC?
➜ How long these sms will stay into SMSC?
➜ Maximum of campaign duration?

# Fine tuning campaign parameters
# Retries policy – Example N°2 solutions

| | | | | |
|---|---|---|---|---|
| *Invocation* | *4 sms* | | | |
| *VP* | *8h* | | *Max Throughput* | *20 sms/s* |
| *Grace periods* | *10mn* | | *Number of retry* | *3* |
| *Targeted cards* | *200 000 cards* | | *Retry delay* | *2h* |
| *Out of coverage* | *30%* | | | |

✦ How many sms due to this campaign, can be stored into the SMSC?
Max stored sms =

✦ How long these sms will stay into SMSC?

- Use case A *(With OTA and SMSC retries)*

   **sms will be stored during**


- Use case B *(With no OTA retry)*

   **sms will be stored during**

✦ Maximum of the campaign duration?

- Use case A

   Campaign duration =
- Use case B

   Campaign duration =

# Fine tuning campaign parameters
# Retries policy – CCI access

**OTA retries parameters need to be setting up when you create a new campaign (Campaign Manager / Create a campaign / New)**



*Recommended configuration: No retry (SMSC will manage retries)*

# Fine tuning campaign parameters
# XCT scheduling – CCI access 1/3



✓ **Define the** start date

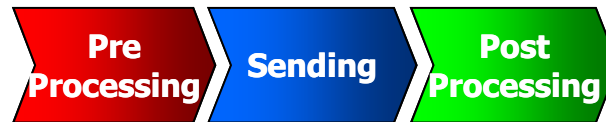✓ **The** ending date **can be define** later via the monitoring window.

**XCT sequence of operations**

# Fine tuning campaign parameters
# XCT scheduling – CCI access 2/3

**XCT sequence of operations**

Pre Processing → Sending → Post Processing

**Pre Processing**

✦ <u>Objective</u> **: Prepare and store the message to be sent**
- Check compatibility between services and card possibilities
- Format the messages and store them in the XCT with the status READY_FOR_SEND
- Prepare the result card content and compute the final synchro counter value

**Sending**

✦ <u>Objective</u> **: Use a much as possible of the available bandwidth**
- Send all SMS in MT mode, receipt all returned status (Submit response and Delivery response) and POR.

**Post Processing**

✦ <u>Objective</u> **: Finalize the card processing**
- ✓ Update card content and update synchro counter
- ✓ Unlock locked cards if locked,

# Fine tuning campaign parameters
# XCT scheduling – CCI access 3/3



**You can save your schedule into a template in order to use it again on for next campaigns**

**Define when each XCT sequences can be processed by the platform**

# OTA Platform documentation

OTA Manager V4.0

Administration Guide

gemalto
security to be free

Tuning campaign              Section 10
✦ Tuning XCT Campaigns       P123