TECHNICAL WHITE PAPER

AGENT BLENDING (PROACTIVE/PREDICTIVE AGENT BLENDING – PAB)

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⊹ Abstract:

In this course, we would look at the working of Agent Blending feature (also called PAB) on Proactive Contact.

Most of the topics below are common to both Hard Dialer and Soft Dialer.

However, topics 6, 8 & 9 are explained from the perspective of Hard Dialer environment. These topics in their headings have "Hard Dialer" emphasized in braces.

⊹ Topics :

1. Terminologies

2. Overview

3. Domains and Domain Groups

4. Why do we have Domain Groups ?

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6. Acquire Process and Release Process **(Hard Dialer perspective)**

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9. Enablement of SIMULTANEOUS ACQUIRE feature **(Hard Dialer)**

1. Terminologies :

PC – Proactive Contact. The term 'Dialer', 'PC' and 'Proactive Contact' are used interchangeably in this document.

Blend engine - blend engine is essentially the set of processes on the Dialer which are responsible for blending. The term 'Dialer', 'blend engine' are used interchangeable in this document and essentially refer to the blend engine software of Proactive Contact.

PAB – Initial 'P' can be Proactive OR Predictive – they work differently. 'AB' stands for Agent Blending.

**DN** – Domain (corresponds to VDN in PBX terms)

DG – Domain Group

CM - Communication Manager. The term 'CM' and 'PBX' are used interchangeably in this document.

2. Overview:

Agent Blending (also referred to as PAB):

- In agent blending, the agent moves/switches between Proactive Contact (PC) and the CM for handling outbound and inbound calls respectively.

- Inbound calls always land on the CM in this case and not on the PC. Whereas, PC makes "only" outbound calls.

- If an agent needs to handle inbound calls, PC "releases" the agent so that the agent moves to the CM to take the inbound call.

- If an agent needs to handle outbound calls, PC "acquires" the agent so that the agent moves to PC and takes outbound calls.

arrows indicate direction of call (source to destination)
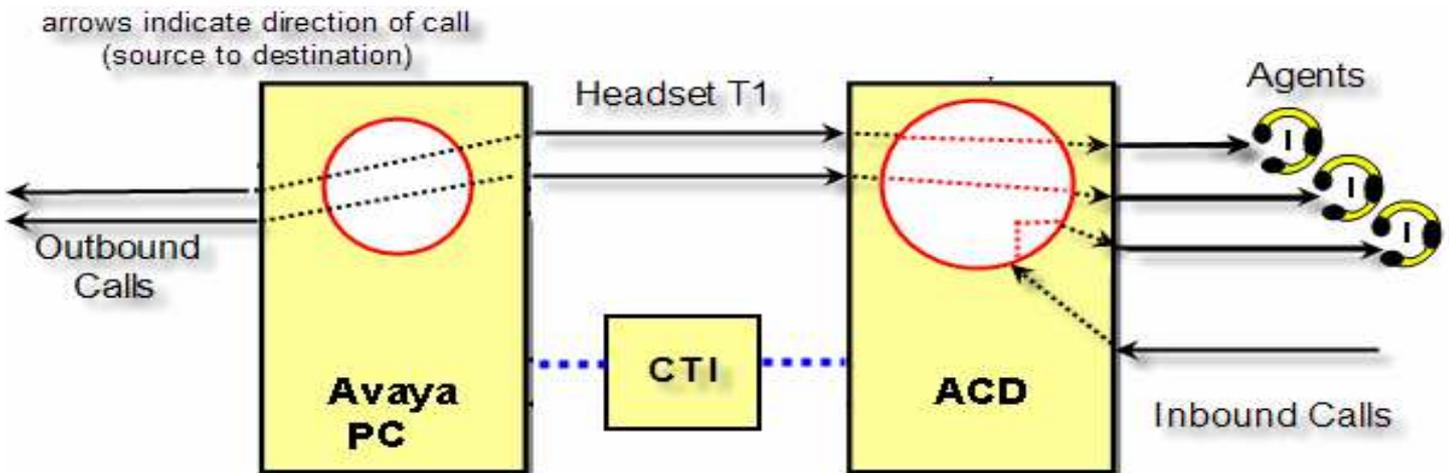
- AES is always required with Agent Blending feature. The purpose of AES in Agent Blending setup is to enable the Proactive Contact blend engine to monitor the inbound activity for the ACD agent through the configured CTI link. AES passes the CTI data about the activity on all the configured Domains (VDNs) to the PC blend engine.

- Using the CTI link, the Dialer knows the volume and status of the inbound calls on the Domains (VDNs) on the CM. Using this status and other configured parameters of the Domain Group, the PC application takes decision to either "acquire" agents for outbound calling or "release" agents to the CM for inbound call handling.

- The AES also tells the Dialer which agent was delivered the acquire call from the VDN and whether the acquire call was dropped or answered.

- The agent in this case logs in to the Dialer via the PC Agent app or API with the ACD box checked, agent type as 'O' and enters his extension (station) number. When an agent logs-in with the ACD box checked, in Proactive Contact terminology the agent is referred to as a PAB agent. On his station, the agent logs-in with his PBX login-ID and becomes part of the skills corresponding to his PBX-login ID.

- Typically and in its simplest form, an agent would belong to 2 skills - one would be called 'acquire skill' and the other would be called 'inbound skill'. The terms 'acquire skill' and 'inbound skill' are from PC perspective and will be used in further explanations, for the CM it is just like any other skill.

3. Domains and Domain Groups

- **Domains (DN) :** A Domain (also called DN) on the Dialer is just a VDN number of the PBX. Domains are configured as part of Domain Groups on the Dialer. A Domain configured on PC must be a valid VDN configured on the PBX. A Domain can be an 'Inbound' (IB) domain or a Team Acquire (TEAM) domain depending on its purpose.

- **Domain Groups (DG) :** A Domain Group consists of a set of Domains/VDNs. Typically, one domain group consists of at least 1 'Inbound' (IB) domain and 1 'Team Acquire' (TEAM) domain, though it can consist of several Inbound and Team Acquire domains.

  An 'Inbound' domain is the VDN on which there would be inbound calls of customers, which would finally reach the PAB agent's phone extension.

  A 'Team Acquire' domain is the VDN on which there would be acquire calls launched by the Dialer, in an attempt to acquire the PAB agent for outbound dialing.

  The PAB agent that is recognized by the Dialer belongs to both the inbound skill(s) and the acquire skill(s) on his station (as he logs-in via his PBX login ID to the station), such that he can receive calls on his station from inbound VDN(s) as well as acquire VDN(s).

4. Why do we have Domain groups ?

Domain groups are used to split/segregate the blending for agents in a call center based on different business functions it may have and in line with that the corresponding skillsets of the agents.

For example, consider a call center which has 3 functions :

- **'ABC' Credit Card function**

- **'XYZ' Credit Card function**

- **'Health Care' function**

- The agents in this call center have skills to a particular function. Some agents work on 'ABC' function, some on 'XYZ' function while others belong to the 'Health Care' function.

- All these 3 functions have the facility of inbound and outbound i.e. their customers can call the contact center to talk to agents and their agents can call customers for telemarketing.

➤ **How would we configure PAB to achieve this requirement :**

- **Dialer side :**

- On the Dialer, the customer may configure 3 different domain groups –

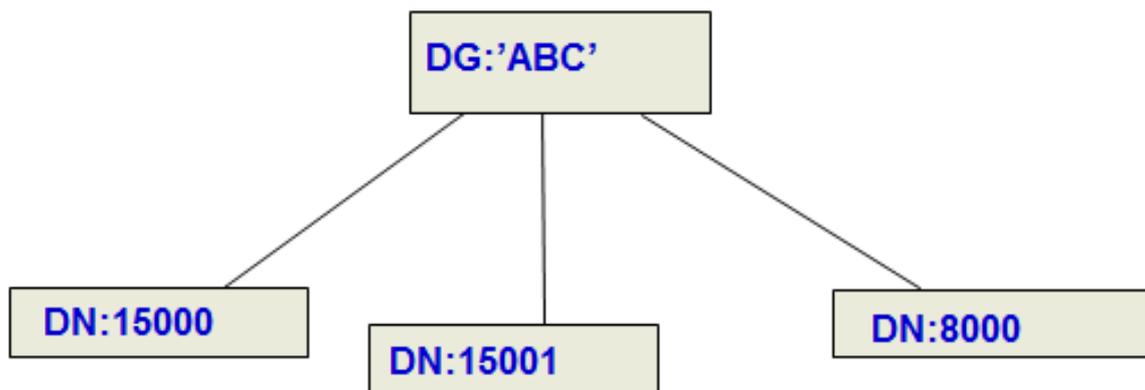1. **DG: 'ABC',** 2. **DG: 'XYZ' and** 3. **DG: 'Health Care'.**

- Each of these domain groups can have several 'Inbound' VDNs within it and one or more 'Team Acquire' VDN(s).

- For example, consider that DG:'ABC' needs 2 Inbound DNs and 1 Team Acquire DN (based on the business) such that :

15000 → INB
15001 → INB
8000 → **TEAM ACQ**

- Similar to the DG: 'ABC', the other Domain Groups 'XYZ' and 'Health Care' will need a set of Inbound and Acquire VDNs based on the business. Note that a particular VDN in one DG cannot and should not be configured in another DG. In other words, VDNs within and across domain groups in the dom_group.data file should be unique.

- The Dialer will have all the domain groups and their domains configured in its dom_group.data file in $VOICEDIR/pab/config. Each domain group has a set of configurable parameters which is discussed later.

- The PC blend engine will launch acquire calls on its TEAM domains and will monitor the inbound traffic on the Inbound (IB) domains by receiving the CTI data via AES.

- **PBX side :**

- Each of these 3 VDNs should be configured on the PBX, i.e. VDN 15000, 15001 & 8000.

 - On the PBX, these VDNs would map to a vector which would route to a skill such that if there is a call on a VDN, it would reach an agent that belongs to the particular skill.

- As mentioned earlier, these 3 VDNs on the PBX are like any other VDNs, whereas on the Dialer, they are recognized as either Inbound or Acquire Domains based on their purpose.

- **VDN ----------→ vector --------→ skill ----→ agent**

So assume the DG:'ABC' has its 3 VDNs configured on the PBX in the following way :-

VDN 15000 → vector 3 → skill 10 → agent station

VDN 15001 → vector 4 → skill 11 → agent station

VDN 8000 → vector 5 → skill 12 → agent station

5. Agent login process :

Consider the requirement that this agent is supposed to handle 'ABC' function related inbound and outbound calls.

The agent would login to the Dialer with his Dialer credentials. Let's say his PC login-id is 'agent1'. He would enter his login id and password. He would login as 'O' type agent with the ACD box checked. Also, he would enter the extension (station) number.

The station can be a Digital or IP station, any endpoint for the PBX. Let's say his station is '4001'. The agent would also login to the station 4001 using his PBX login-id, and thus become associated to the skills corresponding to his PBX login. Lets' say his PBX login-id is '27001', so the agent would login as '27001' to station 4001. As per the above VDN-vector-skill mapping on the PBX for 'ABC' function, this agent login '27001' on the PBX must belong to skills 10, 11 & 12 to be able to receive calls from VDNs 15000, 15001 and 8000 respectively.

'ABC' function's inbound customers would call on inbound numbers provided to its customers by the contact center. These customer calls would eventually hit VDNs 15000 or 15001 on the contact center PBX. The PBX would then follow the vectors 3 & 4 corresponding to these VDNs, and these vectors would route to the skills 10 & 11 respectively. As we know, this agent '27001' on station 4001 is part of these skills so he is in a position to receive calls routed to these skills based on the vector algorithm.

When the Dialer acquires agents for outbound, it would make acquire calls on VDN 8000, which would follow vector 5 and route to skill 12. As we know, this agent '27001' on station 4001 is part of skill 12 as well, so he is in a position to receive calls routed to this skill based on the vector algorithm.

With the above, we can say that the agent is now part of the Dialer as login id 'agent1' and part of the PBX as agent login id '27001', and he is using extension 4001 which is known to the Dialer.

Once the agent logs in as above, he would also join an outbound job on the Dialer which will have an associated calling list with phone numbers of 'ABC' function's customers. The outbound job is intended to make outbound calls to the customers.

Till now, we have seen the login process of the agent on the Dialer and on the PBX station. Let's say the agent has also joined an outbound job on the Dialer. We know that at this point this agent, on his station, is currently in a position to receive both inbound calls from inbound customers as well acquire calls launched from the Dialer. At this point, though, he is neither acquired nor released, he has just followed the login process and joined an outbound job. The Dialer blend engine now has to decide whether to keep this agent on inbound or acquire him for outbound.

6.   Acquire Process and Release Process (Hard Dialer perspective)

With the agent login process, in our example, agent1 on the Dialer has now joined an outbound job. He has logged in to station 4001 with his PBX login '27001' and he belongs to skills 10, 11 & 12.

Now, the Dialer has to decide whether to have the agent for outbound or release him to inbound.

6.1 Acquire Process :

The term "acquire" is used with respect to the Dialer – so acquiring essentially means acquiring an agent for outbound calling on the Dialer. When the Dialer decides to have agents for outbound, it would keep making acquire calls on the TEAM VDN(s), which would follow the vector→skill route and reach the agent extensions who are skilled. Once any agent answers that acquire call on his station, he is considered as 'acquired for outbound' and the Dialer plays the "moving to outbound" message (msg no 252) to the agent. The agent would now be available for outbound calling (the outbound job which the agent joined would make outbound calls for this agent) until the Dialer decides to release him to inbound.

 - In our example, VDN 8000 is the acquire VDN. So when the Dialer decides that it needs agents for outbound calling, it would initiate a call on DN 8000. This call is called the acquire call. The acquire call would hit the PBX through the headset channel of an E1/T1 Span (ISDN or non-ISDN) connected between the Dialer PG230 & the PBX. Alternatively, the headset channel can also be an H.323 channel of an IPTC Card on the PG230 which is connected via LAN to the PBX 'procr' or 'CLAN'.

(headset channel -acquire call)

Dialer CPU → PG230 E1/T1 Span <<---------->> PBX DS1 (E1/T1) →   VDN → vector (route to skill) → agent station

Dialer CPU → PG230 IPTC Card <<---------->> PBX procr1 or CLAN →   VDN → vector (route to skill) → agent station

- Once the call reaches the PBX VDN 8000, in our case it would follow vector 5 and then route to skill 12. Since our agent '27001' on station 4001 belonged to skill 12, he would be skilled to receive this acquire call.

- Note that the Dialer just makes calls to the acquire VDN of the DG, when it decides that it needs agents on outbound based on its blending algorithm. It does not know which agent will get the acquire call when it is launching calls on the VDN. The acquire process of the blend engine is "Not" agent specific, in other words the agent is not predetermined when an acquire call is launched. Once the agent receives the acquire call on his station, the Dialer later 'marks' that agent as an acquired agent to that particular acquire call that he answered.

- We just mentioned that after the login process, our agent '27001' is skilled to receive the acquire call from VDN 8000. When the Dialer makes calls to VDN 8000, the PBX would just follow vector 5, its 'EAS-MIA' (Expert Agent Selection-Most Idle Agent) configuration and route to skill 12. Based on that, whoever is the most idle agent on skill 12 at that time, the acquire call would hit that agent.

- Thus, if there was any other agent on skill 12 who is Idle for a greater time than our agent in example, the acquire call will hit that agent first. The vector based routing to the skill just follows the PBX vector rules and the Dialer has no idea which acquire call would reach which agent till the time the call reaches an agent station via the PBX vector and the agent answers that call on his station.

- The Dialer just keeps making acquire calls until its blend engine decides to stop acquiring any further agents - that decision is based on the Control Method of the Domain Group, configuration parameters and inbound traffic, which are discussed in later sections.

- Let's say in our example, the Dialer agent 'agent1' on station 4001 (PBX login '27001') is the most idle agent on skill 12 as per the PBX vector, this agent has joined an outbound job on the Dialer. And the Dialer blend engine has decided to acquire agents and is making acquire calls on VDN 8000.

- In this situation, the acquire call from VDN 8000 will his station 4001 first. If he were not the 'most idle agent' as per the PBX vector, it would hit some other agent and one of the subsequent acquire calls would hit this agent, so long as the Dialer blend engine continues to make acquire calls.

- Considering this example, let's say the acquire call on VDN 8000 hits the agent on station 4001, and the agent answers the call. At this point, the Dialer maps this 'acquire call id' to the Dialer's 'agent1' and station '4001'.

- Since the Dialer is continuously monitoring all of the configured VDNs in its DG via the CTI (in this case VDNs 15000, 15001 & 8000), it knows when the acquire call on VDN 8000 hits a station, thus it knows that the acquire call reached station 4001 and was answered.

- Once the agent answers the acquire call on his station, if this is the first time the agent is getting acquired since joining the outbound job, the agent would hear the message "Welcome to Avaya Proactive Contact" (msg no 250) and "Moving to Outbound" (msg no 252) on his station. From this point, he would be considered as acquired by the Dialer for outbound and the outbound job would start placing calls for this agent.

Once an agent is acquired, the PBX sees this as "one long call" on that station which will remain established till the time the Dialer wants to keep this agent on outbound. The agent will then take as many outbound calls on the Dialer (from the outbound job) as appropriate until there is a need by the Dialer blend engine to "release to inbound".

6.2 Release process :

- The term 'release' again is with respect to the Dialer and means 'release to inbound' i.e. release the agent from the Dialer to the PBX to take the inbound call. When the Dialer blend engine decides that agents are needed to be moved to handle the inbound traffic (i.e. calls on the inbound VDNs of the DG which the Dialer monitors via the CTI), it releases agents from the Dialer to the PBX, so that the agent is available to take calls hitting the inbound VDNs.

- For releasing an agent, the Dialer plays a message "Moving to inbound" (msg no 251) to the agent and changes the agent state to "R" for Released, so that now no more outbound calls would be placed for that agent from the outbound job. The agent would be considered as "On break" for the outbound job, and that would be displayed on his API screen (PC Agent or External API).

- On the telephony side, the Dialer then just disconnects the established acquire call-ID on the headset channel. This would disconnect the acquire call-ID established to the agent station.

- The agent is now free of the acquire call on his station. Since he is logged in to the Phone with the PBX-login ID belonging to both acquire and inbound skills, his phone line is now available to take a call coming from the inbound VDN → vector → skill to which he belongs. Thus, the agent can now take call(s) on his station from the inbound VDN(s) to which his skilled.

- In our example, after a release, the Dialer agent 'agent1' will show "On Break" for the outbound job on the PC Agent (or external API), his acquire call id will be disconnected on his station '4001', and his phone line on 4001 will now be free to receive any calls from inbound VDNs 15000 or 15001.

- Till the time the Dialer blend engine decides to re-acquire agent(s) of the Domain Group, no acquire calls will be made on the TEAM VDN(s) (in our case VDN 8000)

(headset trunk)

Dialer CPU — PG230 — ✕ — PBX — ACD
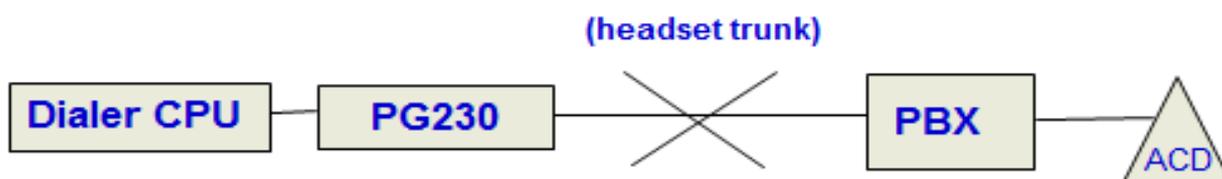
6.3 Re-acquiring after a release :

- When the blend engine decides to re-acquire agents of the Domain Group for outbound, the Dialer again makes calls to the TEAM VDN(s) of the DG through the headset trunk channel(s). Once the call reaches the agent phone via the PBX VDN and the agent answers the call, the agent gets moved back to outbound. At this time, just the "Moving to outbound" (msg no 252) message is played to the agent. The agent is marked as an acquired agent and becomes available again on the outbound job (i.e. he goes "Off-Break" on the outbound job). The outbound job would then start making calls for this agent.

7. Proactive & Predictive Agent Blending

Till now, we have discussed the concept of acquire and release of agents in Agent Blending and how acquiring and release process happens. The next point is the algorithms based on which the Dialer decides "when" to acquire agents and when to release them. There are typically 2 types of agent blending :

7.1. Proactive Blending (which uses the Control Method- **OB_ONLY** in the domain group)

7.2. Predictive Blending (again has 2 sub types :)

    7.2.1) Predictive Blending using Control method- **SL (Service Level)** in the domain group.

    7.2.2) Predictive Blending using Control method- **ASA (Average Speed to Answer)** in the domain group.

7.1 Proactive Blending

- In Proactive Blending, the preference is given to outbound, and agents are continued to be acquired for outbound until there are actual inbound calls waiting in queue and there is a need to release agents to attend those inbound calls.

- In this, agents are "released" to the CM to handle inbound calls only when there are inbound call(s) in queue on the Inbound (IB) VDN(s) of the Domain Group. Once the inbound calls in queue are attended and the agents finish those calls, they are immediately re-acquired back for outbound. This method results in optimal utilization of agents.

- Proactive Blending uses the Control Method "OB_ONLY" in the Domain Group.

- The decision to acquire and release agents in this method is simply based on the MQR (Minimum queued for release) parameter of the Domain Group.

- If there are calls in queue on any of the Inbound VDNs of the DG higher than the configured MQR, then the Dialer blend engine starts releasing agents of that DG from the Dialer to the PBX for inbound. The release process would continue until all the inbound calls are attended such that there are no more calls waiting in the inbound queue.

- During the release process, no acquire calls will be placed on the acquire VDN(s) of the DG.

- Once the inbound calls are attended such that there are no more calls in the inbound queue, the Dialer would start the acquire process again. The agents who were released would get acquire calls on their station immediately 'after' they finish their existing inbound call (provided MQR condition is satisfied).

- Typically, customers set the MQR to '0' in the DG with Control Method "OB_ONLY", such that even if there is a single call in inbound queue, an agent is released to attend that call. And once the agent finishes that call, he is immediately re-acquired for outbound.

- An agent is considered 'qualified' for a 'release to inbound' only when he takes an outbound call and "Releases Line" the on the outbound customer call. In other words, an agent is qualified for a 'release to inbound' only when he is on an outbound call and moves from "Talk" state to "Update" state on the outbound job. Once he moves to 'Update' state on outbound, he is reserved for an inbound release will be moved to inbound as soon as he Finishes the outbound record. (Provided there is an inbound call still waiting and MQR condition is satisfied for a release)

- Agents who are 'IDLE' on the outbound job and waiting for outbound calls are <u>not qualified</u> for a 'release to inbound' until they take an outbound call and move to 'Update' state.

- This is because, when an agent is 'IDLE' on the outbound job, it means the job has calculated the agent during its most recent call pacing calculation, based on which certain number of lines were demanded and outbound customer numbers were dialed. Based on the outbound numbers dialed, the anticipation is that the outbound job "may" just be connecting an outbound customer call to the 'IDLE' agent. Therefore, there would be a 'risk' of outbound call being abandoned if the IDLE agent were to be moved abruptly to inbound.

- Thus, by its default algorithm, Proactive Blending does not release 'IDLE' outbound agents to handle the inbound call in queue.

- If 'IDLE' agents on outbound need to be released to inbound, REL_PROBE_TIME feature needs to be configured to probe a release every few seconds for IDLE agents outbound.

7.2 Predictive Blending

- In Predictive Blend, preference is given to inbound and some agents are kept in inbound in anticipation of inbound calls coming-in. The anticipation or prediction is done based on observations from the recent incoming/inbound call statistics.

- In Predictive Blend, agents are acquired for outbound when the set 'Service Level (SL)' or 'Average Speed to Answer (ASA)' is achieved/exceeded on inbound calls and there is excess capacity on inbound.

- This method is used by businesses where there is very high inbound traffic and where preference needs to be given for inbound call handling. Businesses using this method are very stringent on meeting and exceeding their inbound SLAs.

- Predictive Blending works efficiently when there are at least 25 agents per Domain Group.

7.2.1 Predictive Blending with Control Method - SL (Service Level) :

In this, the domain group uses the "SL" or "Service Level" Control method. The key configuration parameters in this type of domain group are :

a.) Service Criterion (SC in secs)

b.) Desired Service Level (DSL in %)

c.) Maximum or Abatement Service Level (MSL in %)

SC - Service Criterion is the maximum number of seconds an inbound call can be held in queue before the system counts the call against the service level that is desired.

DSL - Desired Service Level is the desired percentage of inbound calls that satisfy the service criterion i.e. the desired percentage of inbound calls which should be answered within the configured Service Criterion.

MSL - Maximum Service Level or Abatement Service Level is the percentage of inbound calls that satisfy the Service Criterion set above which there is no "perceived benefit". This causes a reluctance to return agents to inbound calling if the service level goes above this value. If exceeding the desired service level is more beneficial to the customer than freeing up more agents for handling outbound calls, then this percentage should be set greater than the desired service level (up to 100%). Do not set this percentage equal to the desired service level.

How it works :

SL - Service Level control method is based on the proportion of calls queued for less than a specified time. The domain group having **SL** as the control method acquires or releases agents to meet the requirement of the **"Percentage of incoming calls that is desired to be answered (DSL %) within some time limit (Service Criterion)"**. The requirement is configured in the domain group as DSL value (in %) and SC value (in secs).

The blend engine works to meet this requirement such that the actual service level achieved at any instant is equal to or greater than the Desired Service Level configured. The blend engine "predicts" a service level value based on recent incoming call history. It then compares the predicted value to the configured DSL. PAB then acquires or releases agents to adjust the predicted service level to match the configured desired service level (DSL).

For prediction, the recent incoming call history is measured over a time interval specified by the **RTI** parameter in the Domain Group, also called as **Rolling Time Interval**. The minimum setting for RTI is .25 or 15 min. The rolling time interval begins when the blend engine starts.

Example :

If DSL is set to 80 % and SC is set to 5 secs, it means out of all the inbound calls hitting the inbound VDN(s) of the DG, "at least" 80 % of the calls should be answered by agents within 5 secs. The blend engine will work towards meeting and exceeding this requirement. Thus, the DSL is the minimum percentage of inbound calls that should satisfy the Service Criterion.

The blend engine on the PDS will release and acquire agents in such a way that the DSL is either met or exceeded.

Based on the incoming call history measured over the RTI, if the blend engine sees that the Desired Service Level (DSL) may not be met in the next RTI (Rolling Time Interval), it releases more agents to inbound in an attempt such that the actual service level achieved is able to exceed the Desired Service Level (DSL).

On the other hand, if, based on the incoming call history, the blend engine sees that the achieved SL is much higher than the configured DSL, and that there is excess capacity on inbound, it acquires agents from inbound to outbound.

Configuration parameters for SL Control Method as seen from Blend Administrator (GUI) :

Below is a blend administrator GUI snapshot of a Domain Group configured with "SL" control method :-
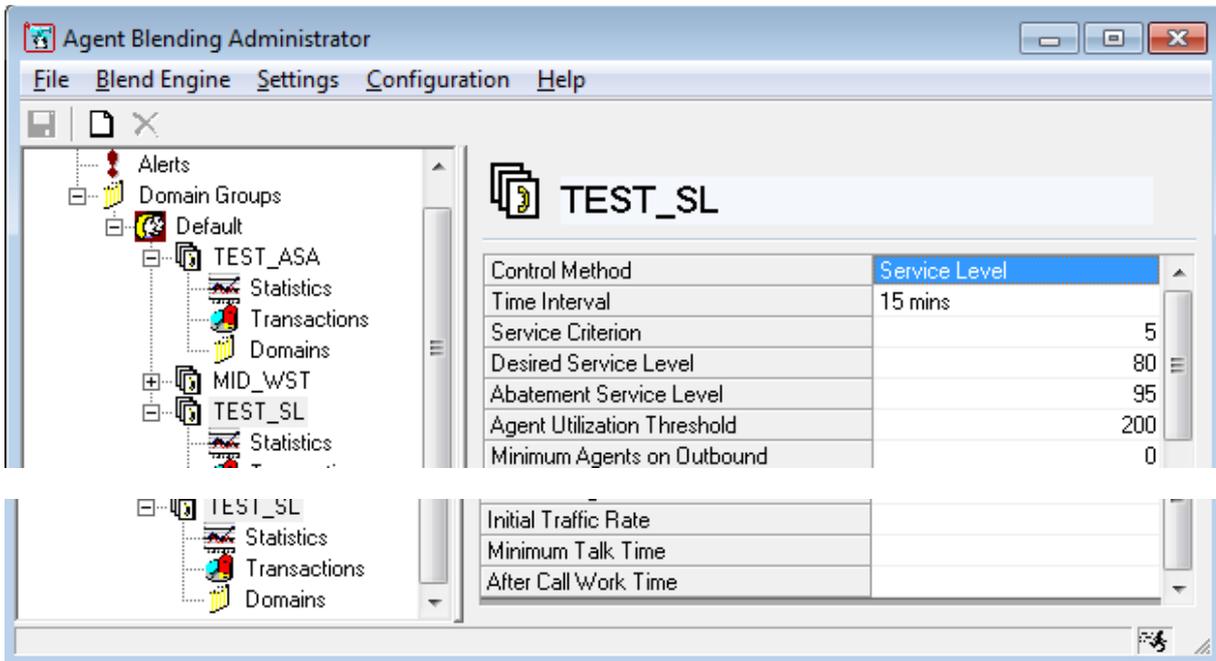
We see the "**Control Method**" is configured as "**Service Level**" which is the parameter specifying the type of Domain Group.

The "**Time Interval**" is the Rolling Time Interval described in the explanations earlier. It is set to "**15 mins**" in this case.

The "**Service Criterion**" is set to **5** (which is 5 secs).

The "**Desired Service Level**" is set to **80** (which is 80 %)

The "**Abatement Service Level**" is set to **95** (which is 95 %)

The "Agent Utilization Threshold", "Minimum Agents on Outbound", "Initial Traffic Rate", "Minimum Talk Time" & "After Call Work Time" parameters are explained later in this section.

The "Agent Utilization Threshold" is typically set to 200. The "Minimum Agents on Inbound" is typically set to 0. Whereas the "Initial Traffic Rate", "Minimum Talk Time" & "After Call Work Time" are normally kept as blank.

Configuration parameters for SL Control Method as seen in the backend (dom_group.data file) :

Here is how the above configured domain group looks in the backend in the $VOICEDIR/pab/config/dom_group.data file :-

```
# TEMPLATE
# ------------------------------------------------------------------------
# *DG | DG_NM | dg_id | RTI | CM | MAAS | SC | DSL | MSL |
#  AUT | MAO | TR | TT | ACWT | MQR | afi | rti |
# ------------------------------------------------------------------------
#
# Description of fields within a Domain Group
# -------------------------------------------
# *       - Start Of New Record { MUST be in first column of record}
# DG      - Domain Group Record Key   { Always DG}
# DG_NM   - Domain Group Name {Descriptive name use by UI to specify a domain}
# dg_id   - Domain Group ID { FILLED IN BY SYSTEM}
# RTI     - Time Interval (hours)
# CM      - Control Method {ASA-Avg.Spd Answered,SL-Sevice Lvl,OB_ONLY-Outbound}
# MAAS    - [Target] Average Speed to Answer (seconds)
# SC      - Service Criterion (seconds)
# DSL     - Desired Service Level (%)
# MSL     - Abatement Service Level (%)
# AUT     - Traffic Intensity Threshold (%)
# MAO     - Minimum # of Agents on Outbound (# agents)
# TR      - Initial Traffic Rate (calls/second)
# TT      - Minimum Talk Time (seconds)
# ACWT    - Minimum After Call Work Time (seconds)
# MQR     - Minimum Queued for Release (OB_ONLY groups)
# afi     - Acquisitions From Inbound { FILLED IN BY SYSTEM }
# rti     - Releases To Inbound        { FILLED IN BY SYSTEM }
#

*DG | TEST_SL | 2 | 0.25 | SL | MAAS | 5 |
     80 | 95 | 200 | 0 | TR | TT |
     ACWT | MQR | afi | rti |
```

We see the following from above snapshot :

Value '***DG**' in the 1st position which the standard convention indicating start of a DG record

Value '**TEST_SL**' in the 2nd position which is the name of the Domain Group

Value '**2**' in the 3rd position which is the dg_id {generated by the system}

Value '**0.25**' in the 4th position for RTI (which is 15 mins)

Value '**SL**' in the 5th position for CM (Control Method)

Value '**5**' in the 7th position for SC (Service Criterion)

Value '**80**' in the 8th position for DSL (Desired Service Level)

Value '**95**' in the 9th position for MSL (Abatement Service Level)

Value '**200**' in the 10th position for AUT (Traffic Intensity Threshold or Agent utilization Threshold)

For the other parameters for whom we see their field name as it is instead of a value in their position, it means those parameters are :

    i.)   Either **not relevant** to the Domain Group type OR

    ii.)   Are **relevant & could be used but not mandatory** while configuring the DG with its specified type.

For example, 'MAAS' in 6th position is the field name itself, it doesn't have a value because it is not relevant for an SL Domain Group. Similarly, the 'MQR' in 15th position contains the field name itself because MQR is not relevant for an SL Domain Group.

The 'TR', 'TT', 'ACWT' in the 12th, 13th and 14th position contain the field name itself because those parameters were left as 'blank' in this SL domain group, this suggests that these were not mandatory parameters and could be kept as 'blank'.

7.2.2 Predictive Blending with Control Method - ASA (Average Speed to Answer) :

In this, the domain group uses the '**ASA' or 'Average Speed to Answer'** Control method.

Average Speed to Answer is a measurement of how long an inbound call waits in queue before an agent answers it.

The key configuration parameter used in this type of domain group is :

MAAS (Maximum Average Answer Speed or Target Average Speed to Answer in seconds) : MAAS is the backend name to the parameter per the dom_group.data file.

However, in GUI blend administrator, the parameter is seen as **"Average Speed to Answer",** though it represents the Target Average that is required to be met**.**

MAAS - **Maximum Average Answer Speed** is the desired number of seconds within which the agents are supposed to answer the inbound calls. It is a requirement target which is configured and is in seconds.

How it works :

ASA - **Average Speed to Answer** control method is based on the average time inbound calls are in the queue waiting to be answered. The domain group using the ASA control method acquires or releases agents to meet the requirement of the "**Target maximum average length of time customers can wait for an agent (MAAS)".** This requirement is configured in the domain group as MAAS value (and is in seconds).

The blend engine works to meet this requirement such that the actual Average Speed to answer achieved at any instant is within the configured Target maximum Average Speed to Answer (MAAS).

The blend engine "predicts" the average speed at which inbound calls will be answered by agents based on the recent incoming call history. It then compares the predicted value to the configured MAAS. PAB then acquires or releases agents to adjust the predicted average speed to answer to match the specified average speed-to-answer.

Again, for prediction, the recent incoming call history is measured over the **Rolling time interval (RTI).**

Example :

If MAAS is set to 5 secs and RTI is 15 mins, then the average answer time of the inbound calls over the 15 min interval should be less than or equal to 5 secs. If not, then the blend engine releases more agents to inbound in an attempt to meet the specified MAAS (i.e. to make the average answer time less than MAAS).

On the other hand, if the actual Average Speed to Answer is well within the configured MAAS, and if the blend engine sees that there is excess capacity on inbound, it will acquire agents from inbound to outbound.

Configuration parameters for ASA Control Method as seen from Blend Administrator (GUI) :

Below is a blend administrator GUI snapshot of a Domain Group configured with 'ASA' control method :-
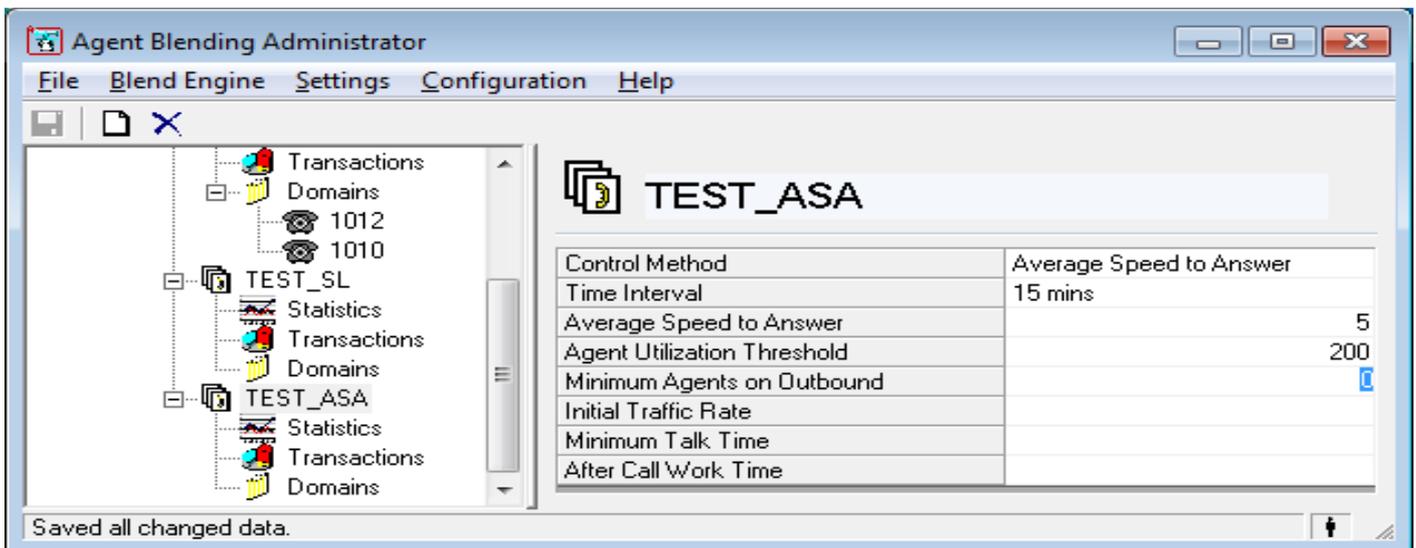
We see the "**Control Method**" is configured as "**Average Speed to Answer**" which is the parameter specifying the type of Domain Group.

The "**Time Interval**" is the Rolling Time Interval described in the explanations earlier. It is set to "**15 mins**" in this case.

The "**Average Speed to Answer**" (i.e. target MAAS) is set to **5** (which is 5 secs).

The "Agent Utilization Threshold", "Minimum Agents on Outbound", "Initial Traffic Rate", "Minimum Talk Time" & "After Call Work Time" parameters are explained later in this section.

The "Agent Utilization Threshold" is typically set to 200. The "Minimum Agents on Inbound" is typically set to 0. Whereas the "Initial Traffic Rate", "Minimum Talk Time" & "After Call Work Time" are normally kept as blank.

Configuration parameters for SL Control Method as seen in the backend (dom_group.data file) :

Here is how the above configured domain group looks in the backend in the $VOICEDIR/pab/config/dom_group.data file :-

```
#
# TEMPLATE
# -----------------------------------------------------------------------
# *DG | DG_NM | dg_id | RTI | CM | MAAS | SC | DSL | MSL |
#  AUT | MAO | TR | TT | ACWT | MQR | afi | rti |
# -----------------------------------------------------------------------
#
# Description of fields within a Domain Group
# -------------------------------------------------
# *       - Start Of New Record { MUST be in first column of record}
# DG      - Domain Group Record Key   { Always DG}
# DG_NM   - Domain Group Name {Descriptive name use by UI to specify a domain}
# dg_id   - Domain Group ID { FILLED IN BY SYSTEM}
# RTI     - Time Interval (hours)
# CM      - Control Method {ASA-Avg.Spd Answered,SL-Sevice Lvl,OB_ONLY-Outbound}
# MAAS    - [Target] Average Speed to Answer (seconds)
# SC      - Service Criterion (seconds)
# DSL     - Desired Service Level (%)
# MSL     - Abatement Service Level (%)
# AUT     - Traffic Intensity Threshold (%)
# MAO     - Minimum # of Agents on Outbound (# agents)
# TR      - Initial Traffic Rate (calls/second)
# TT      - Minimum Talk Time (seconds)
# ACWT    - Minimum After Call Work Time (seconds)
# MQR     - Minimum Queued for Release (OB_ONLY groups)
# afi     - Acquisitions From Inbound { FILLED IN BY SYSTEM }
# rti     - Releases To Inbound       { FILLED IN BY SYSTEM }
#

*DG | TEST_ASA | 3 | 0.25 | ASA | 5 | SC |
     DSL | MSL | 200 | 0 | TR | TT |
     ACWT | MQR | afi | rti |
```

We see the following from above snapshot :

Value '***DG**' in the 1st position which the standard convention indicating start of a DG record

Value '**TEST_ASA**' in the 2nd position which is the name of the Domain Group

Value '**3**' in the 3rd position which is the dg_id {generated by the system}

Value '**0.25**' in the 4th position for RTI (which is 15 mins)

Value '**ASA**' in the 5th position for CM (Control Method)

Value '**5**' in the 6th position for MAAS (Target or Maximum Average Speed to Answer)

Value '**200**' in the 10th position for AUT (Traffic Intensity Threshold or Agent utilization Threshold)

For the other parameters for whom we see their field name as it is instead of a value in their position, it means those parameters are :

    i.)   Either **not relevant** to the Domain Group type OR
    ii.)   Are **relevant & could be used but not mandatory** while configuring the DG with its specified type.

For example, 'SC', 'DSL' & 'MSL' in 7th, 8th and 9th positions contain the field names itself, these fields don't have a value because they are not relevant for an ASA type Domain Group. Similarly, the 'MQR' in 15th position contains the field name itself because MQR is not relevant either for an ASA Domain Group.

The 'TR', 'TT', 'ACWT' in the 12th, 13th and 14th positions contain the field names itself, because those parameters were left as 'blank' in this SL domain group, this suggests that these were not mandatory parameters and could be kept as 'blank'.

7.2.3 Other fields of the Domain Group - common to SL and ASA Control methods :

The RTI, TR, TT, AUT, MAO, afi & rti fields are common to both SL and ASA Domain Groups :

RTI : We already know that for prediction in these Control Methods, the recent incoming call history is measured over a time interval specified by the **RTI** parameter in the Domain Group, also called as **Rolling Time Interval**. The minimum setting for RTI is .25 or 15 min. The rolling time interval begins when the blend engine starts.

TR - Traffic Rate is the average number of inbound calls that are offered to the Domain Group per second. When configured, this parameter must have a value greater than or equal to zero. PAB uses the configured

value (if configured - it is not mandatory) for initial calculations when it starts, before it has enough "actual value" for Traffic Rate to use in its calculations.

TT - Talk Time is the average number of seconds that agents spend on connections to each inbound call. When configured, this parameter must have a value greater than zero. PAB uses the configured value (if configured - it is not mandatory) for initial calculations when it starts, before it has enough "actual values" for Talk Time to use in its calculation. However, if the actual talk time falls below this value, the PAB system ignores the actual time and uses this value.

ACWT - After Call Work Time is the average number of seconds per call that agents spend in the after call work mode for each inbound call. When configured, this parameter must be a value zero or greater. PAB uses the configured value (if configured - it is not mandatory) to calculate after call work time when it starts, before it has enough "actual values" to use in its calculations. However, if the actual after call work time falls below this value, the PAB system ignores the time and uses this value.

AUT - Agent Utilization Threshold or Traffic Intensity Threshold is the expected call traffic rate divided by the expected call servicing capacity of agents per unit time, above which agents are not acquired for outbound calling despite other inbound performance conditions. This percentage must be greater than zero and could be greater than 100 percent. If this parameter is much greater than 100 percent it may have no effect. When over-utilization of agents is not a concern then this parameter should be set to 200 percent which will turn it "off". The AUT represents a goal value for PAB to maintain the ongoing ratio of call rate to agent utilization. The parameter when set to a lower value tends to reduce the rate at which the blend engine acquires agents. For example, a ratio of 100 percent attempts to keep agents on inbound calling activity unless the current agent utilization is under 100 percent.

Agent utilization is the percentage of time agents are on calls or updating records divided by total time agents can handle calls during the rolling time interval. For instance, if there are 10 active agents and the time interval is one hour, the total available time is 600 minutes (10 agents x 60 minutes).

If the agents were on calls or updating records for 530 of the 600 minutes, the agent utilization is 88%.

MAO - Minimum Agents on Outbound is the number of agents from this domain group that are continually required to be assigned to outbound calling operations without regard to any inbound performance conditions.

Whenever the number of agents that are assigned to outbound is below this number, the system attempts to assign an additional agent to outbound. Be careful with this parameter. Even if the service level drops below the goal, these agents will not be released to inbound calling.

afi - Acquisitions from Inbound is filled in by the system as agents are acquired.

rti - Releases to inbound is filled in by the system as agents are released.

8. Acquire calls default behavior (Hard Dialer) :

8.1 Default behavior - one call per VDN at a time :

By default, there can be only one acquire call on one VDN at a time. So if there are 2 TEAM ACQ VDNs in the Domain Group, then the Dialer can make 2 acquire calls at the same time, one on each VDN of the DG. The acquire call is limited to one per VDN at a time.

Within a particular VDN, PAB will not be able to launch a second acquire call until the first one is :

i.) either answered by an agent OR
ii.) dropped due to timeout from the hunt group.

- Therefore, by default an acquire call can be on a VDN only if there is no existing call on the same VDN.

- Answered means an ACD agent picks up/answers the call on his phone. Dropped due to timeout means the call gets dropped from the hunt group because there are no ACD agents remaining to be acquired.

- This is the default design, with **SIMULTANEOUS_ACQUIRES** set to **NO** in master.cfg.

8.2 Background behind the default behavior

As we know, the agent blending application acquires idle inbound agents for outbound calling by placing calls to defined VDN(s). Agents that answer the acquire calls are "nailed-up" to the dialer. The dialer maintains data structures called "nailed-up control blocks" that contain information about each nailed-up connection including the id of the agent that answered the call.

The default behavior is limited to one acquire call per domain (DN) at a time. This call must either be answered, or time-out waiting for answer, before another call can be launched. The restriction was enacted because the 'call connect' event containing the answering agent information is matched to the nailed-up block using only the dialed number. If multiple calls were active at the same time, it would be impossible to know which agent answered which acquire call.

8.3 Need for Multiple acquire VDNs in a DG (Business need to acquire agents faster)

Customer business many a times use multiple acquire VDNs per DG, in an environment where there are several PAB agents who login to the Dialer at the same time and are waiting to be acquired.

When there are several PAB agents per DG, you would need to launch several acquire calls at once so that within few minutes, all agents in the call center get acquired. This would not be possible if you have only one acquire VDN per DG (since by the default design, within a VDN, there can be only one acquire call at a time). Configuring multiple acquire VDNs per DG would help achieve faster acquiring of the agents, because at any instant, the number of acquire calls being made would be equal to the number of TEAM VDNs configured in the DG.

9. Simultaneous Acquires feature (Hard Dialer)

- The Simultaneous Acquires feature introduction was originally intended to allow several acquire calls to be placed to an acquire domain (VDN) at the same time.

- The intention was to overcome the current limitation of one acquire call at a time on a TEAM VDN.

- For this feature, the SIMULTANEOUS_ACQUIRES parameter was introduced in master.cfg.

- This feature also needs a configuration change on trunk group from CM side.

- However, note that the **SIMULTANEOUS_ACQUIRES feature <u>has not been tested</u> to be working as expected by the Product House**.

- This feature should not be enabled on a Hard Dialer environment on any customer site as it has not been tested. **On all Hard Dialer environments, make sure SIMULTANEOUS_ACQUIRES is set to NO in master.cfg.**