

OpenEdgePBX

Unified Communications with ABL



Agenda

- Dot R and Me
- PBX Past
- A Time for Change: Phases 1, 2 and 3
- How it all works today
- Demos
- OBX Future
- Questions



Dot R and Me

- Started using Progress from DLC in 1987
- Dot R created 1991
 - Me created sometime in 1965, released 1966 ☺
 - Created several version control systems
- Acquired by Tarlo Lyons 1996
 - Management buyout 1998, renamed to Tessera
 - “Financial Management” company (aka debt collectors)
 - 2011 independent once more



PBX Past: 1998-2005

- Early 1998 installed BT Meridian System
 - 10 ISDN lines
 - 2 Analogue
 - 30 staff
 - Some contention ... 😊
- Late 1998
 - Added more lines for new dialler
 - Now up to 30
 - Cost approx 30k for upgrade



PBX Past: 1998-2005

- Late 1998
 - installed commercial predictive dialler
 - Disaster
 - Cost 150k + for 10 agents
 - Fixed seats – not floating
 - Used DDE to communicate with 4GL app



PBX Past: 1998-2005

- Other problems
 - Lost inbound callerid
 - Could not answer phones appropriately
 - No realtime integration
 - Had to manually upload / download kill lists, campaigns etc
 - No call blending, could only be inbound or outbound
 - Turned off 2003



A Time for Change: Plans

- August 2005
- Plans to expand to 140+ staff over next 5 years
 - Needed more extensions and lines
 - Needed more Meridian Kit to cope
 - Extra cabinets, Extra cards, Extra cost ☹️
 - Took on another floor in the building
 - Needed phone systems on both floors

A Time for Change: Plans

- £100k : Project cost for the phone updates
 - Directors balk at the cost
- Someone suggests that I can do it instead
 - No idea how a PBX works
 - Tight project deadlines (December 2005)
 - Requirement to keep existing kit
- Start trawling around the internet for ideas
 - Find Asterisk
 - Open source
 - Active community
 - Cool stuff to play with 😊



Phase 1

- Extensions on the desk
 - Simple requirement. Put an extension on everyone's desk
 - Mixture of Meridian (11th) and Asterisk (5th)
 - Seamless integration of 11th and 5th floors
 - Cabling was , well, interesting ...
 - Dell server (512MB, 30GB HDD) used as PBX
 - Linked to meridian using PRI card
 - December 19th, moving in day
 - January 8th, meridian dies. Takes nearly 2 weeks to get the spare parts shipped in

Phase 1

- 2006 – June 2007
 - New System features rolled out
 - Voicemail
 - Conferences
 - Dictation
 - DDI for all staff
 - Still no systems integration
 - Manual dialling
 - Queue members manually added to config files



A Time for Change: More Plans



- May 2007
 - New client reporting requirements
 - How many calls
 - To which type (home / mobile etc)
 - How many RPC
 - Outcome of call
 - Obviously, not possible to manually record this information accurately
 - Need to integrate phone system with DebtNet

Phase 2

- How do we do this ?
 - Need PBX to “speak” to DebtNet
 - Need DebtNet to initiate calls
- What else do we want ?
 - Remove need for manual editing of queues / agents
 - Remove need for manual editing of phone config
 - Log all phone activity for an agent

Phase 2: Communication



- #1: Read pbx logging file from debtnet
 - Intensive, horrible and just plain “yukky”
- #2: Read manager commands from IP Port
 - Jammed often (trying to use ABL sockets)
- #3: Use experimental new PBX feature, Jabber support
 - spent many nights debugging with author
 - ABL clients do all the heavy lifting (creating records, updating etc) after receiving the message from the PBX

Phase 2: Initiate Calls

- #1: Use direct connection to manager tcp/ip port
 - Up to 100 clients connecting / disconnecting caused PBX manager a lot of problems
- #2: Use proxy server to connect clients
 - Single connection then to PBX manager
- ABL client can now send commands and data directly to the phone system
 - Initiate calls
 - Reload Queues
 - Reload Phone Config

Phase 2: Application integration

- Use Jabber ActiveX to receive messages from PBX
 - Tells DebtNet about a new call
 - Gives Agent popup box containing all the information about the call (Queue Name, number)
 - Tells agent when call has ended
- Built in dialling – double-click to call number
- DebtNet now has notification of call progress
 - Able to check results of call (answered / busy / ooo) etc
 - So can now store call information against the account
 - Start time, End time, call result, actions applied

Phase 2: Live

- Went live July 2006
- Some small improvements in productivity
- Main feature was the call life integration for reporting purposes



Phase 3: A Dialler

- July 2007 - decision is made an automated dialler is needed
 - 80 agents, 140 staff
 - Agent productivity low, < 8 minutes per hour on the phone
 - Call throughput abysmal < 50,000 call attempts per month
- Various commercial diallers considered to integrate with our system
 - £100k + : Project cost for the dialler
 - Directors balk at the cost
- Someone suggests that I can do it instead
 - No idea how a Dialler works
 - Tight project deadlines (October 2007)
 - Requirement to keep existing kit

Phase 3: A Dialler

- Need to rewrite dialler and application telephony code
 - PBX now needs to read and write DebtNet database
 - Needs to find free agents
 - Needs to mark agents as busy etc
 - Agents need to be marked as available / busy etc
 - Need to blend inbound / outbound for maximum efficiency

Phase 3: Reading / writing

- PBX needs to read & write to the DebtNet database
 - Setting agent state
 - Removing agents from pool
- #1 No problem ! SQL92 to the rescue
 - PBX has built-in ODBC commands to read/write data
 - Testing was successful
 - Yippee!


Phase 3: Dialler integration



- Application enhanced for auto-dialling
 - Campaigns for calls
 - Teams
 - Agents assigned to teams
 - Teams assigned to campaigns
 - All drag'n'drop
 - Campaign manager runs
 - Works out number of free (and potentially free) agents available
 - Starts dialling ...

Phase 3: Dialler integration



- Benefits of Application integration
 - When calling an account, schedules all numbers for that account
 - One account can have up to 10 different numbers
 - If account removed from campaign, all numbers automatically removed
 - Account can be removed from a campaign for any number of reasons, not just as a result of a call
 - Kill list is automatic, and instantaneous
 - Account can be added to a running campaign instantaneously
 - No stopping / starting campaign
- 

Phase 3: Live date & problems



- Live late October 2007
- Heavy usage caused serious problems
 - Highlighted lack of scalability testing (how do you test for 80+ agents without actually having them in ?)
 - PBX kept core dumping, nearly always when executing sql statements
 - Sometimes 5 times a day
 - Not acceptable
 - Could not solve the problem
 - So, what can we do ?

Phase 3: Solving the problem



- Remove SQL 😊
 - Helped write and debug a “realtime driver” for a web call
 - Switched pbx to use a web call to read/write data
 - Webspeed !!
 - Instead of SQL statements, use ABL business logic to determine results and data
 - PBX hands off to webspeed, ABL does the business, and returns the data back to the PBX
- Use realtime web driver
 - webspeed to provide config for pbx

Phase 3: Result!

- No more core dumps
- Faster !
- Allows for much more complex processing
 - For example: Inbound call details passed to webspeed, put through to most appropriate agent
- Clear separation between PBX and application
 - Can swap out either side
- No need to install progress on PBX

Phase 3: Result!

- November 2007 – Upgraded to new version
- 2010: Where we are now
 - Agent productivity >40 minutes per hour on the phone
 - Call throughput > 250,000 call attempts per month
 - Through natural wastage, down to 30 Agents
 - Handling 5x as many accounts as 2007

The Bottom Line: Financial

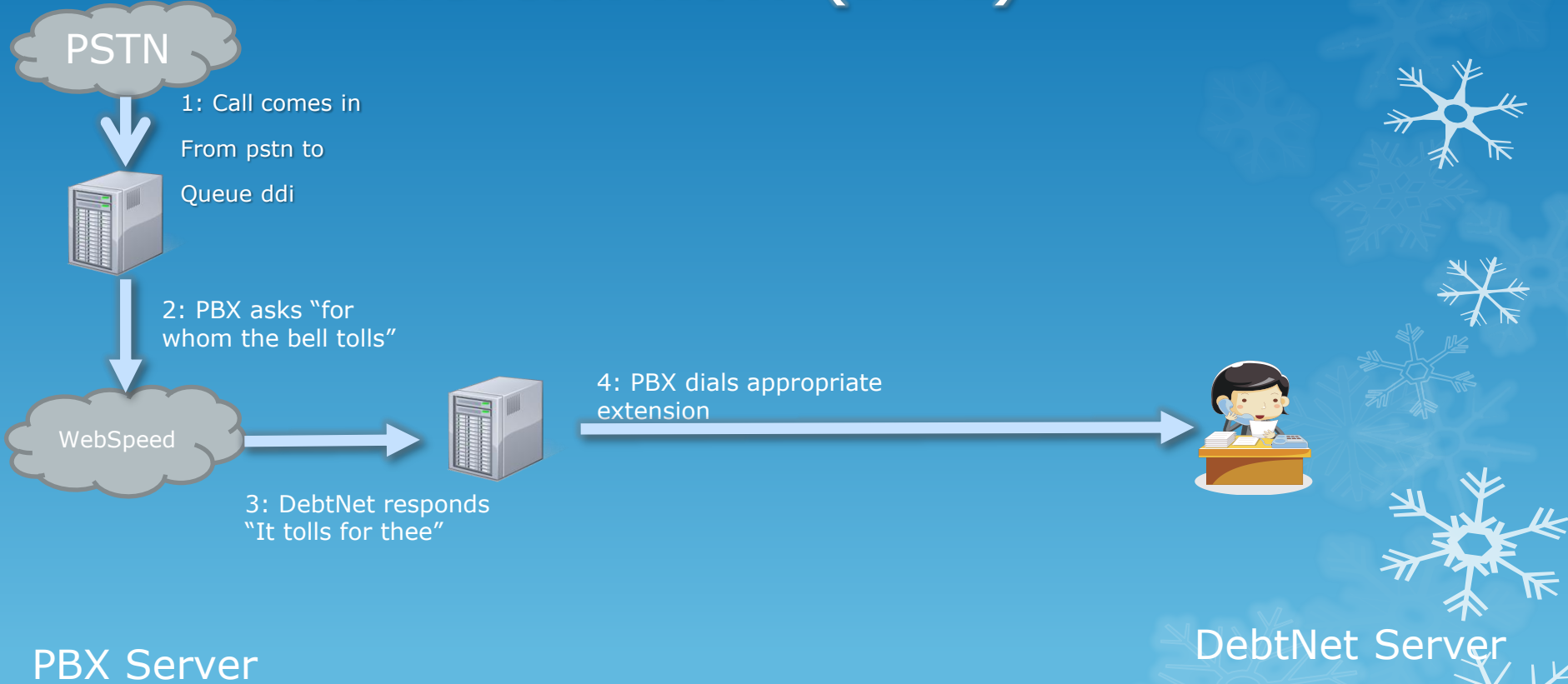


- Savings made since 2005
 - replacement phone system: £100,000
 - Dialler: £120,000
 - Salary savings: £2,000,000+
 - Bragging rights: Priceless

The Bottom Line: Benefits

- Allowed the company to reduce commission in order to keep and attract clients
 - “Punch above our weight”
 - We can supply stats and data that not many competitors can
 - Online auditing, along with call listening
 - Implemented automatic survey system within 2 days
- Very agile
 - Systems
 - Processes
 - Business

Inbound call flow (DDI)



Inbound call flow (DDI)

- Find owner of DDI
- Find hotdesk device
 - If no hotdesk, find default assigned device
- Return JabberID, device name of user

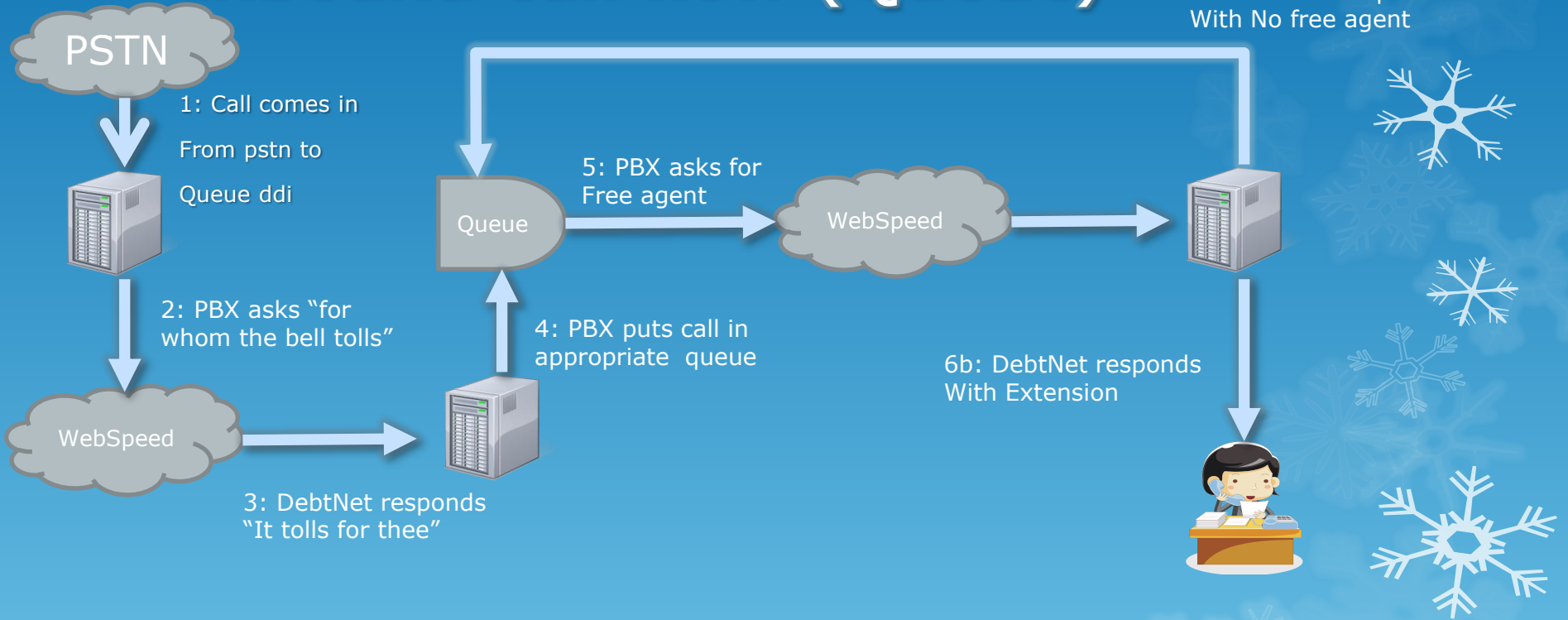


Inbound call flow (DDI)



```
DEF VAR TargetUser AS CLASS ValueObject.UserCode NO-UNDO.  
...  
WHEN "ddi" THEN  
  DO:  
    ASSIGN lv_DDI          = webspeed#:get-field("ToDDI").  
  
    TargetUser = UserCodeLib:Instance:FindUserByDDI(lv_DDI).  
  
    ASSIGN lv_Data = SUBSTITUTE("&1,&2,&3,&4,&5,&6,&7",  
                                TargetUser:RecordCalls,  
                                TargetUser:JabberID,  
                                TargetUser:DialString,  
                                TargetUser:AnswerMachine:MailBox,  
                                IF TargetUser:AllowMonitor THEN TargetUser:UserCodeGUID ELSE "",  
                                TargetUser:HotDeskChannel,  
                                TargetUser:AnswerMachine:DivertTo).  
  
  END.
```

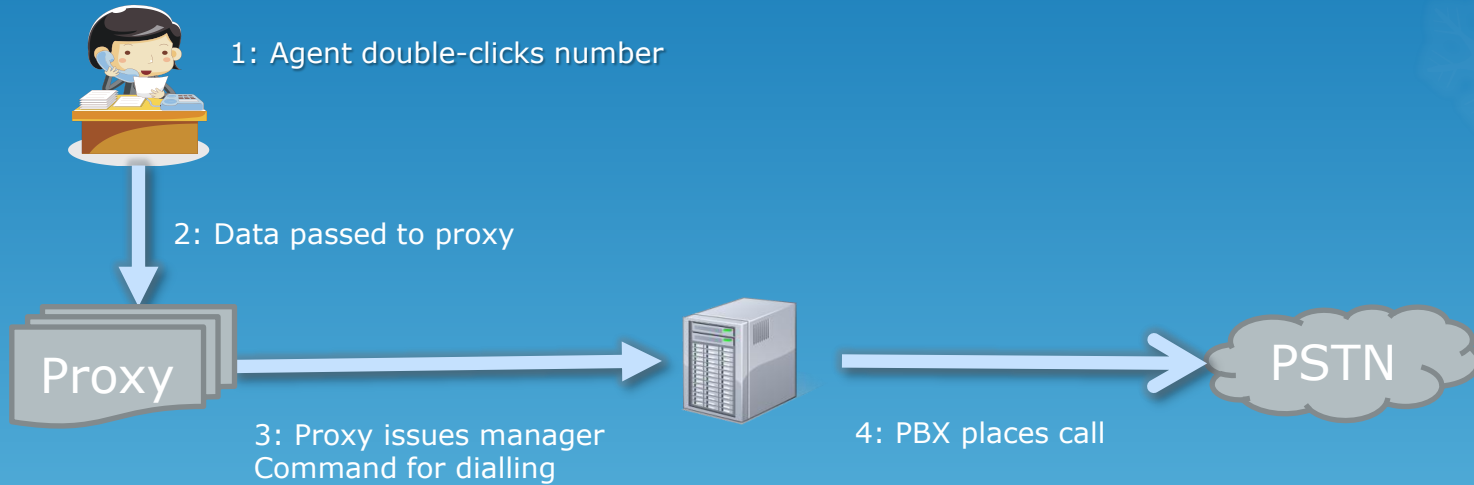
Inbound call flow (Queue)



Inbound call flow (Queue)

- Get queue details (open / closed)
- If closed, leave voicemail
- Add call to queue, wait for free agent
- PBX calls webspeed: "hey, need an agent"
- Webspeed gives back device of free agent

Outbound call flow (Manual)



Outbound call flow (Manual Click)



- Log onto phone extension (set hotdesk)
- Double-click on phone number
- Call passed to proxy, onto pbx
- PBX calls agent, then calls number

Outbound call flow (manual)



```
Lib:Call:DialExternal("01702444777","01376529046").
```

```
DEF VAR ActiveCall1 AS CLASS ValueObject.ActiveCall NO-UNDO.
```

```
ActiveCall1 = NEW ValueObject.ActiveCall().
```

```
ASSIGN ActiveCall1:DialledNumber    = p_number  
        ActiveCall1:UseFootprint    = p_Footprint.
```

```
ActiveCall1:AddVariable("AGENTEXTENSION",Me#:HotDeskExtension).
```

```
Lib:User:GoNotReady(Me#:usercodeGUID,"Busy",SUBSTITUTE("Calling &1",p_Number)).
```



User Object (ValueObject)

```
USING Progress.Lang.*;
```

```
CLASS ValueObject.UserCode INHERITS ValueObject.base:
```

```
DEF PUBLIC PROPERTY JabberID           AS CHARACTER NO-UNDO GET . SET .
DEF PUBLIC PROPERTY CallerIDNumber     AS CHARACTER NO-UNDO GET . SET .
DEF PUBLIC PROPERTY CallerIDName      AS CHARACTER NO-UNDO GET . SET .
DEF PUBLIC PROPERTY DialString        AS CHARACTER NO-UNDO GET . SET .
DEF PUBLIC PROPERTY UserCodeGUID       AS CHARACTER NO-UNDO GET . SET .
DEF PUBLIC PROPERTY AnswerMachineGUID AS CHARACTER NO-UNDO GET . SET .
DEF PUBLIC PROPERTY Email              AS CHARACTER NO-UNDO GET . SET .
DEF PUBLIC PROPERTY Salutation         AS CHARACTER NO-UNDO GET . SET .
DEF PUBLIC PROPERTY UserCode          AS CHARACTER NO-UNDO GET . SET .
DEF PUBLIC PROPERTY DDINumber         AS CHARACTER NO-UNDO GET . SET .
DEF PUBLIC PROPERTY InterfaceName     AS CHARACTER NO-UNDO GET . SET .
DEF PUBLIC PROPERTY ReadyStatus       AS CHARACTER NO-UNDO GET . SET .
DEF PUBLIC PROPERTY HotDeskChannel    AS CHARACTER NO-UNDO GET . SET .
DEF PUBLIC PROPERTY HotDeskExtension  AS CHARACTER NO-UNDO GET . SET .
```

```
DEF PUBLIC PROPERTY ExpectedAvailability AS DATETIME NO-UNDO GET . SET .
```

```
DEF PUBLIC PROPERTY EmployeeID        AS INTEGER NO-UNDO GET . SET .
DEF PUBLIC PROPERTY UserGroupID       AS INTEGER NO-UNDO GET . SET .
```

```
DEF PUBLIC PROPERTY AllowMonitor      AS LOGICAL NO-UNDO GET . SET .
DEF PUBLIC PROPERTY RecordCalls       AS LOGICAL NO-UNDO GET . SET .
```

```
DEF PUBLIC PROPERTY Phones            AS CLASS ValueObject.Phone EXTENT GET . SET.
DEF PUBLIC PROPERTY HotDeskPhone     AS CLASS ValueObject.Phone      GET . SET.
DEF PUBLIC PROPERTY AnswerMachine    AS CLASS ValueObject.AnswerMachine GET . SET.
```

```
DESTRUCTOR PUBLIC UserCode ( ):
```

```
    DEF VAR lv i AS INT NO-UNDO.
```

User Library



```
METHOD PUBLIC VOID GetUser(p_User AS CLASS ValueObject.UserCode) :
```

```
...
```

```
Get user data, store in p_user object
```

```
...
```

```
p_User:AnswerMachine = ValueObject.AnswerMachine:Get(p_User:AnswerMachineGUID) .
```

```
p_User:HotdeskPhone = lib:UserDevice:HotdeskPhone(p_User:UserCodeGUID) .
```

```
p_User:Phones = lib:UserDevice:LoadPhones(p_User:UserCodeGUID) .
```

```
...
```



Listen to recorded call

- Use ABL library method to listen to call
- Calls your extension
- Connects to pbx
- Finds appropriate recording
- Playback through the phone
 - ff/rew/pause etc

```
Lib:call:ListenToCall(SomeCallID).
```

Listen to live call

- Use ABL library method to listen to live call
- Calls your extension
- Connects to pbx
- Finds appropriate channel
- Playback through the phone
 - If called with optional parameter allows you to speak to the agent without the other party hearing you

```
Lib:Call:ListenToLiveCall(SomeCallID[, "Whisper"])
```


Call an extension

- Use ABL library method to make call
- Connects to pbx
- Dials your extension
- Dials appropriate extension

```
DEF VAR ActiveCall1 AS CLASS ValueObject.ActiveCall NO-UNDO.
```

```
ActiveCall1 = NEW ValueObject.ActiveCall().
```

```
ASSIGN ActiveCall1:DialledNumber = "5711".
```

```
Lib:call:DialInternal(ActiveCall1).
```

Link two extensions

- Use ABL library method to join 2 extensions in a call

```
DEF VAR ActiveCall1 AS CLASS ValueObject.ActiveCall NO-UNDO.
```

```
ActiveCall1 = NEW ValueObject.ActiveCall().
```

```
ASSIGN ActiveCall1:DialledNumber = "5711"  
       ActiveCall1:CallerID      = "5710".
```

```
Lib:call:DialInternal(ActiveCall1).
```

Leave automatic answer machine Message

- Use ABL library method to leave message
 - Dynamically generated using TTS for name and reference, rest of the message is pre-packed
 - “Would [Mr John Smith] please call Rockwell on 0800-333456 quoting reference [12345]. Thank you”
- Agent can push a button if they get a call that is an

```
METHOD PUBLIC VOID AutoAnswerMachine (p_Activecall AS ValueObject.ActiveCall):  
    AsteriskLib#:AMIRedirect(p_ActiveCall:ExternalChannel, "leavemessage", "answermachine").  
    RETURN.  
END METHOD
```

Campaign [Tel - Plan Reviews: Starts On 22/03/11] : 00:00:00

Campaign Items Campaign Data Options and Settings

| | | | | | |
|-------------------------|--|---|--|---|--|
| Start Stop Action | Items to work : 2078 Items worked : 484 Penetration : 23.2 Item Stats | Time Running : 00:00:00 Time Left : Campaign Ends : Time Stats | Average Call : 00:00:00 Called : 917 Answered : 356 (38.82%) Campaign Stats | Not Answered : 502 (54.74%) Engaged : 16 (1.74%) Bad Numbers : 31 (3.38%) | Abandoned : 8 (0.87%) Answer Machine : 208 (22.68%) Right Party : 57 (6.22%) |
|-------------------------|--|---|--|---|--|

Marie De... / 00:00:19
 Scott Cow... / 00:09:04
 Alun Mear... / 00:05:49
 Emily Sca... / 00:05:23
 Samanth... / 00:04:00
 David Bos... / 00:02:46

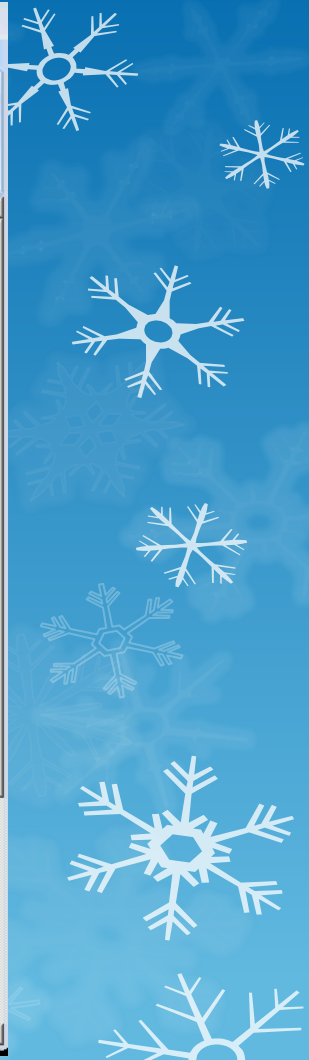
| | | | | | |
|-----------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|
| | | | | | |
| Available | Talking (07908044318) | Talking (07979967593) | Inbound Call From 0142 | Talking (01227372365) | Talking (01273588127) |
| 5617 | 4552 | 4553 | 5809 | 5810 | 5818 |

Danielle L... / 00:02:05
 Jackie Fe... / 00:02:02
 David Wh... / 00:01:42
 Linda Bla... / 00:01:34
 George B... / 00:01:05
 Peter Bog... / 00:00:06

| | | | | | |
|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | | | | |
| Talking (07977241830) | Inbound Call From 0127 | Talking (01484309488) | Calling 1410783733007 | Talking (07896853733) | Talking (01278459539) |
| 1001 | 5663 | 5605 | 5621 | 5824 | 5636 |

Michael P... / 00:00:02
 Stephan ... / 00:01:33
 Robert Ne... / 00:01:02
 Joanne St... / 00:00:19
 Martin La... / 00:01:21
 Jushna B... / 00:37:19

| | | | | | |
|-----------------------|-----------|-----------|-----------|-------------------|---------|
| | | | | | |
| Talking (02085206673) | On Wrapup | On Wrapup | On Wrapup | Wrapup (00:02:36) | Meeting |



Screenshots : Agent Allocation

Team / Agent Allocation

Teams

- Ad Hoc team
- Collections - Admin
- Collections - Dialler
- Collections - High Bal & LID
- Collections - Inbound
- EDCA team
- IT
- LID - 1
- LID - 2
- LID - 3
- Team Leaders
- Wasps - 3PDM
- Wasps - ar team
- Wasps - Correspondence
- Wasps - Disputes
- Wasps - Inbound

Agents

Alex Moss-Austin ... Campaign Manager

- Alex Moss-Austin ([Collections Phone Teams] / [Tessera Titans] / Collections - Dialler)
- Amanda Boardman ([WFMT])
- Amanda Hill ([Warrior Wasps] / Wasps - Disputes / Wasps - Reviews)
- Ann Roberts ([Warrior Wasps] / Wasps - Inbound / Wasps - PaceForward)
- Anna Waters ()
- Annie Hall ()
- Anthony Pegrum ([IT])
- Audit Team 2 ()
- Barbara Rayson ([Other])
- Ben Johnson ([Tessera Titans] / [Collections Phone Teams] / Collections - High Bal & LID)
- Ben Smith ()
- Ben Tamlyn ([Collections Management Team] / Collections - Inbound)
- Bill Hall ([Legal Eagles] / [Collections Management Team])
- Bradley Osborn ([Accounts])
- Campaign Manager ([WFMT])

Carmen Butterworth ... Glen Beaumont

Helen Smeeton ... Karen Ashwell

karim taha ... Lisa Britten

Lisa Hall ... Peter Boggis

Philippa Pocklington ... Simon Harris

Stephan Wood-Victoria Pannell

Screenshots : Call scoring

ScoreCall

Scored Calls Only User: From: 10/09/2010 To: 17/09/2010 Refresh

Debref:

| Call Date | User | Debref | Score | Scored By | Queue | Review | Installment | Frequency | Promise Amount | Due |
|---------------------|-------------|----------|--------|-----------|----------|--------|-------------|-------------|----------------|------|
| 10/09/2010 16:02:10 | scatlon | 43649078 | 61.00% | klm | ROCK | no | ?? | ?? | ? | ? |
| 10/09/2010 15:55:18 | cg | 45399935 | 61.00% | klm | Outbound | no | ?? | ?? | ? | ? |
| 10/09/2010 14:45:44 | SStrick | 36128342 | 61.00% | BT amlyn | ROCK | no | ?? | ?? | 12,080.00 | 15/0 |
| 10/09/2010 14:40:53 | scatlon | 44067239 | 60.00% | BT amlyn | ROCK | no | ?? | ?? | ? | ? |
| 10/09/2010 14:34:11 | md | 44193584 | 61.00% | BT amlyn | Outbound | no | 1.00 | Monthly | ? | ? |
| 10/09/2010 14:01:43 | scatlon | 45582725 | 29.00% | kf | Outbound | no | ?? | ?? | ? | ? |
| 10/09/2010 13:49:57 | cg | 45568098 | 29.00% | klm | ROCK | no | ?? | ?? | ? | ? |
| 10/09/2010 12:23:40 | md | 40675857 | 90.00% | BT amlyn | ROCK | no | 75.00 | Fortnightly | ? | ? |
| 10/09/2010 11:24:06 | AMossAustin | 45545554 | 61.00% | gdavies | Outbound | no | 20.00 | Monthly | ? | ? |

Investigation: 06 Assertiveness: 09

Negotiation: 09 Effort: 09

Soft Skills: 09 Overall: 09

Compliance: 09 N/A: 00

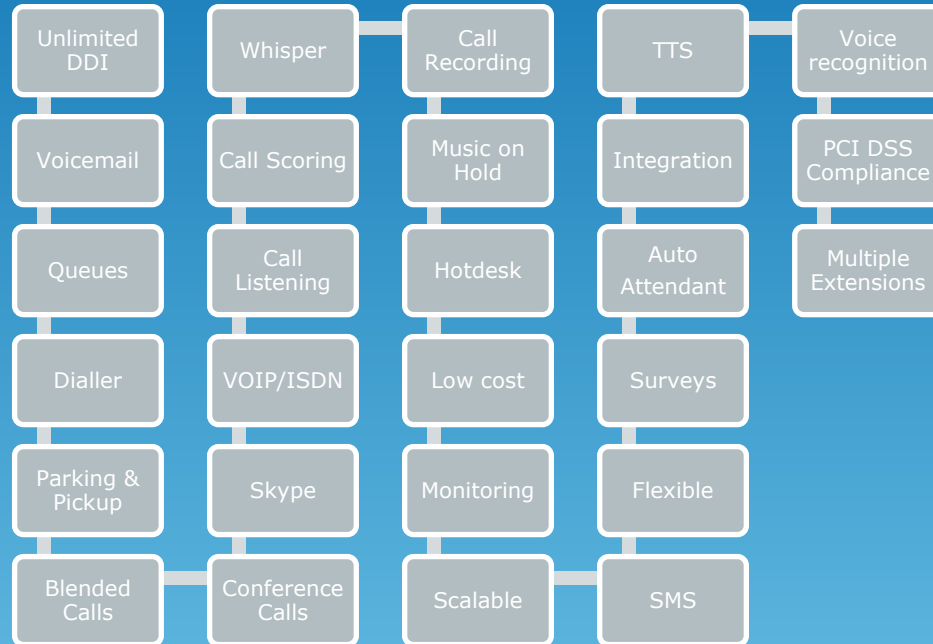
N/A: 00 N/A: 00

Total Score: 90%

13/09/10:BT amlyn-----
Changed Total Score To 90 From 0

Monitor Save

Some Features



The Future: Enhancements



- No more teams
 - Uses agent tags
 - No need for allocation of teams to queues / campaigns
- No more campaign building
 - All items now have tags for selection by certain campaigns
 - Realtime removal / addition to running campaigns
 - An item can potentially be in more than one campaign at a time

The Future: Enhancements



- Structures of campaigns, work queues and queues
 - Different structures on different days
 - Allows an agent to be assigned to appropriate work automatically
 - Different timings of campaigns etc for each day
 - Uses Goggle Calendar

The Future: Enhancements



- LCR across Voip providers
 - Based on date / time / number
- Using mobile numbers for outbound contact
 - More likely to answer a phone given a mobile callerid
- Integration with GoogleVoice
- Custom Call Center
 - On-Demand agent allocation
 - Remote monitoring / control by client
 - HTML5 / Android / iPad

The Future: Enhancements



- Remember me Queues
 - If you have to go before your call is answered, when you call back, you are put at the position you were
- Telephone-based account management
 - Card payments, enquiries etc
- Automated reminder system
 - Payments due, Reviews due etc
- Out-sourced call center
- Cloud-based dialler
- This is all for live in Q2+Q3 this year 😊

Questions

