



Application Notes for Configuring Netcall QueueBuster with Avaya Aura™ Communication Manager using E1 Trunks - Issue 1.0

Abstract

These Application Notes describe the configuration steps required for Netcall QueueBuster to successfully interoperate with Avaya Aura™ Communication Manager.

The objective of the test was to evaluate interoperability of the products in a contact center, offering automated call-backs to inbound callers. Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1 Introduction

These Application Notes describe the configuration steps required for the Netcall QueueBuster product to successfully interoperate with Avaya Aura™ Communication Manager. Netcall QueueBuster runs on the Netcall Intelligent Communications Platform™ (ICP), which is a server supporting the range of Netcall call-back and productivity solutions. The Netcall ICP running QueueBuster uses Dialogic boards to connect to Communication Manager using E1 or T1 connections. One board is used for calls inbound from Communication Manager to QueueBuster and also for calls outbound from QueueBuster to Communication Manager agents. The other board is used solely for call-back calls to customers and can either route through Communication Manager or connect straight into the Public Switched Telephone Network (PSTN). Integration is achieved using Integrated Services Digital Network (ISDN) messaging over the D-Channel. E1 trunk groups were used for the compliance testing and the E1 connection for callback calls to customers was routed through Communication Manager.

Netcall QueueBuster gives customers an alternative to queuing. When a caller is in a queue they can opt to use QueueBuster to call them back when an agent becomes available. The call will be routed into QueueBuster for the caller to record their name and choose whether to be called back on the number presented as ANI or enter a different number. QueueBuster then calls an Avaya Aura™ Communication Manager VDN/vector and queues for an available agent. When an agent answers the call, QueueBuster announces the name of the person being called back, commences dialing the customer and connects the agent to the outbound trunk. If the call to the customer is unsuccessful, QueueBuster will announce the reason to the agent and give them the option to reschedule the call.

1.1 Interoperability Compliance Testing

The interoperability compliance tests included feature functionality and serviceability testing. The feature testing focused on testing scenarios that involve interaction between the NetCall QueueBuster and Communication Manager, including various sequences involving the following:

- Verification of connectivity of E1 trunks between the two systems
- Verification of correct inbound call queuing with correct CLI information and vector routing
- Inbound call testing of various scenarios, including busy handling and invalid telephone numbers
- Agent call queuing tests including multiple call queuing and agent failure tests
- Handling by NetCall and Avaya systems of different customer failure scenarios
- System capacity checking that Avaya trunks behave as expected when in service
- Failover testing of each of the QueueBuster system and the Communication Manager

The serviceability testing focused on verifying NetCall QueueBuster ability to recover from adverse conditions, such as disconnect from Communication Manager.

1.2 Support

For technical support on QueueBuster, contact the Netcall Helpdesk at +44 207 570 8714. Technical support emails can be sent to customer.services@netcall.com.

2 Reference Configuration

Figure 1 show the configuration used in the QueueBuster compliance test.

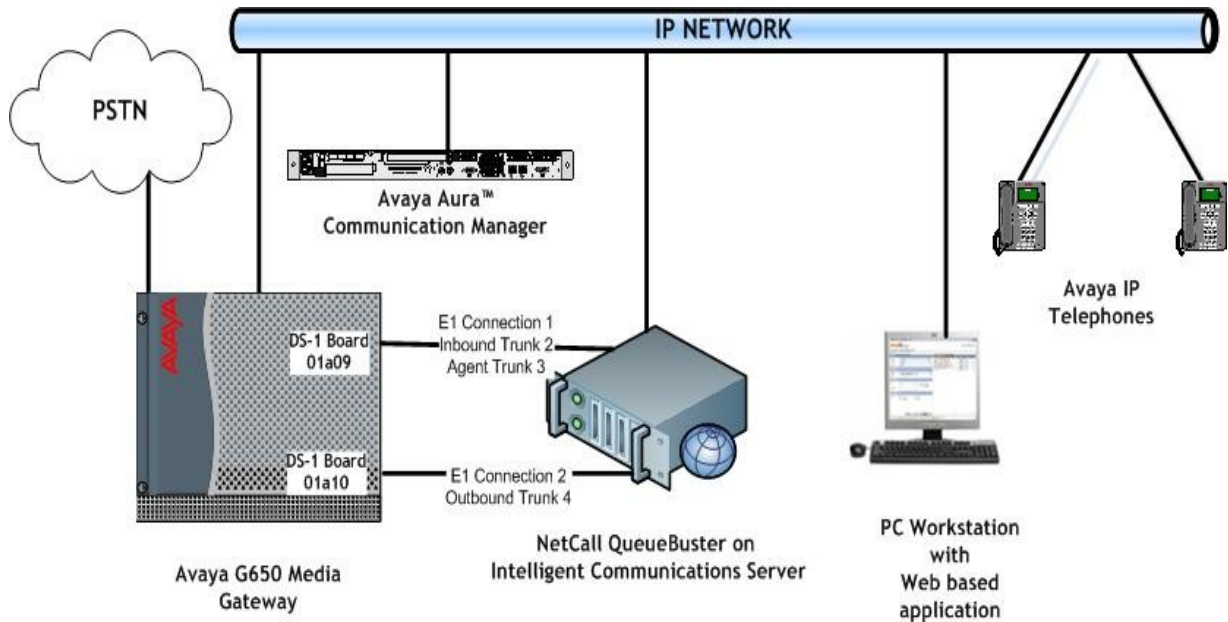


Figure 1: NetCall QueueBuster Test Configuration

3 Equipment and Software Validated

The following equipment and software were used for the sample configuration provided:

Equipment	Software Version
Avaya S8500B Server	Avaya Aura™ Communications Manager 5.2 (R02.0.947.3 -17294)
Avaya™ G650 Media Gateway IPSI TN2312BP CLAN TN799DP IP Media Processor TN2602AP DS1 Interface TN246BP DS1 Interface TN246CP DS1 Interface TN246CP VAL-ANNOUNCEMENT TN2501AP	HW15, FM46 HW01, FM32 HW02, FM49 HW05, FM024 HW02, FM024 HW02, FM024 HW03, FM021
Avaya 96xx Series IP Telephones (H.323) 9640 9670G	3.0 3.0
NetCall QueueBuster	3.0
NetCall Intelligent Communications Platform	3.0
Dialogic D/300SC-E1, DTI/300SC	Build 5.1

Table 1: Hardware and Software Version Numbers

4 Configure Communication Manager

The basic configuration of Communication Manager is beyond the scope of these Application Notes. This section provides the procedures for verifying and configuring Communication Manager. The configuration and verification operations illustrated in this section were all performed using Communication Manager System Administration Terminal (SAT). The procedures include the following areas:

- Verify Communication Manager license
- Administer DS-1 Boards and Trunk Groups
- Administer Call Routing
- Administer VDNs, Vectors and Agent Logins
- Configure Feature Access Codes
- Set up Announcements on the G650 Announcement Board

4.1 Verify Communication Manager License

Use the **display system-parameters customer-options** command to verify that Communication Manager is licensed to meet the minimum requirements to interoperate with the NetCall system. Those items shown in bold in the screen below indicate required values or minimum capacity requirements. If these are not met in the configuration, please contact an Avaya representative for further assistance.

On **Page 2**, the value configured for **Maximum Concurrently Registered IP Stations** must be sufficient to support the total number of IP stations used.

display system-parameters customer-options		Page	2 of 11
OPTIONAL FEATURES			
IP PORT CAPACITIES		USED	
Maximum Administered H.323 Trunks:		100	0
Maximum Concurrently Registered IP Stations:		18000	0
Maximum Administered Remote Office Trunks:		0	0
Maximum Concurrently Registered Remote Office Stations:		0	0
Maximum Concurrently Registered IP eCons:		0	0
Max Concur Registered Unauthenticated H.323 Stations:		10	0
Maximum Video Capable H.323 Stations:		10	0
Maximum Video Capable IP Softphones:		10	0
Maximum Administered SIP Trunks:		10	5
Maximum Administered Ad-hoc Video Conferencing Ports:		10	0
Maximum Number of DS1 Boards with Echo Cancellation:		0	0
Maximum TN2501 VAL Boards:		10	1
Maximum Media Gateway VAL Sources:		0	0
Maximum TN2602 Boards with 80 VoIP Channels:		128	0
Maximum TN2602 Boards with 320 VoIP Channels:		128	1
Maximum Number of Expanded Meet-me Conference Ports:		0	0

On **Page 4** verify that the **ISDN-PRI** customer option is set to **y**.

display system-parameters customer-options		Page	4 of 11
OPTIONAL FEATURES			
Emergency Access to Attendant? y		IP Stations? y	
Enable 'dadmin' Login? y			
Enhanced Conferencing? n		ISDN Feature Plus? n	
Enhanced EC500? n	ISDN/SIP Network Call Redirection? n		
Enterprise Survivable Server? n		ISDN-BRI Trunks? y	
Enterprise Wide Licensing? n		ISDN-PRI? y	
ESS Administration? n	Local Survivable Processor? n		
Extended Cvg/Fwd Admin? n	Malicious Call Trace? n		
External Device Alarm Admin? n	Media Encryption Over IP? y		
Five Port Networks Max Per MCC? n	Mode Code for Centralized Voice Mail? n		
Flexible Billing? n			
Forced Entry of Account Codes? n	Multifrequency Signaling? y		
Global Call Classification? n	Multimedia Call Handling (Basic)? n		
Hospitality (Basic)? y	Multimedia Call Handling (Enhanced)? n		
Hospitality (G3V3 Enhancements)? n	Multimedia IP SIP Trunking? n		
IP Trunks? y			
IP Attendant Consoles? n			

On **Page 6** verify that the **Lookahead Interflow (LAI)** and **Vectoring (Basic)** customer options are both set to **y**. LAI is not required for QueueBuster but is recommended as it allows the Communication Manager vector to route the call to the next vector step when QueueBuster is busy or unavailable.

display system-parameters customer-options		Page 6 of 11
CALL CENTER OPTIONAL FEATURES		
Call Center Release: 5.0		
ACD? y	Reason Codes? n	
BCMS (Basic)? y	Service Level Maximizer? n	
BCMS/VuStats Service Level? n	Service Observing (Basic)? y	
BSR Local Treatment for IP & ISDN? n	Service Observing (Remote/By FAC)? y	
Business Advocate? n	Service Observing (VDNs)? y	
Call Work Codes? n	Timed ACW? n	
DTMF Feedback Signals For VRU? n	Vectoring (Basic)? y	
Dynamic Advocate? n	Vectoring (Prompting)? y	
Expert Agent Selection (EAS)? y	Vectoring (G3V4 Enhanced)? y	
EAS-PHD? y	Vectoring (3.0 Enhanced)? y	
Forced ACD Calls? n	Vectoring (ANI/II-Digits Routing)? y	
Least Occupied Agent? n	Vectoring (G3V4 Advanced Routing)? y	
Lookahead Interflow (LAI)? y	Vectoring (CINFO)? y	
Multiple Call Handling (On Request)? n	Vectoring (Best Service Routing)? y	
Multiple Call Handling (Forced)? n	Vectoring (Holidays)? y	
PASTE (Display PBX Data on Phone)? n	Vectoring (Variables)? y	
(NOTE: You must logoff & login to effect the permission changes.)		

If any of the above mentioned customer options are not set, contact the Avaya sales team or business partner for a new license.

4.2 Administer DS-1 Boards, Trunk Groups and Signaling Groups

Two E1 trunks are required between Communication Manager and NetCall Intelligent Communications Server. Two DS-1 boards are installed and configured on the G650 Gateway as displayed in **Figure 1**. Three trunk groups are required for the test configuration. **Table 2** displays the details of each of the DS-1 boards, trunks and signaling groups set up for the configuration.

Type	Trunk Group No.	DS-1 Board	Ports	Signaling Group
Inbound	2	Internal - 01a09	1-6	2
Agent	3	Internal - 01a09	7-15, 17-31	2
Outbound	4	External - 01a10	1-15, 17-31	4

Table 2: E1 configuration details

4.2.1 DS-1 Boards

The first DS-1 is used for Communication Manager to route incoming calls into QueueBuster and for QueueBuster to route calls to Communication Manager agents. For the purposes of these Application Notes, this DS-1 shall be referred to as the internal DS-1. The second DS-1 is used for QueueBuster to route outgoing calls to Communication Manager for onward routing to customers. For the purposes of these Application Notes, this DS-1 shall be referred to as the external DS-1. Both DS-1 boards are configured in the same way. Use the **add ds1 x** command, where **x** is the slot number where the DS-1 board is inserted on the G650 Gateway. Configure the fields as follows.

- **Name:** NetCall
- **Bit Rate:** 2.048
- **Line Coding:** hdb3
- **Signaling Mode:** isdn-pri
- **Connect:** pbx
- **Interface:** network
- **Country Protocol:** etsi
- **Interface Companding:** alaw
- **CRC?** y

```
add ds1 01a09                                     Page 1 of 1
DS1 CIRCUIT PACK

Location: 01A09                                     Name: NetCall
Bit Rate: 2.048                                     Line Coding: hdb3

Signaling Mode: isdn-pri
Connect: pbx                                         Interface: network
TN-C7 Long Timers? n                               Country Protocol: etsi
Interworking Message: PROgress
Interface Companding: alaw                           CRC? y
Idle Code: 11111111
DCP/Analog Bearer Capability: 3.1kHz

T303 Timer(sec): 4
Disable Restarts? n

Slip Detection? n                                   Near-end CSU Type: other

Echo Cancellation? n
```

4.2.2 Trunk Groups

The first trunk group routes calls from Communication Manager into QueueBuster and consists of the first 6 ports of the internal DS-1. For the purposes of these Application Notes, this trunk group will be referred to as the inbound trunk group. The second trunk group routes calls from QueueBuster to Communication Manager agents and consists of the last 24 ports of the internal DS-1. For the purposes of these Application Notes, this trunk group will be referred to as the agent trunk group. The third trunk group routes calls from QueueBuster to Communication Manager for onward routing to customer numbers and consists of all 30 ports of the external DS-1. For the purposes of these Application Notes, this trunk group will be referred to as the outbound trunk group. The number of

ports in each trunk group may vary; the values used in the compliance testing are consistent with a large proportion of the installed base. All three trunk groups are configured in the same way. Use the **add trunk-group x** command, where **x** is an available trunk group number. On **Page 1** configure the fields as follows:

- **Group Type:** Set this value to **isdn**.
- **Group Name:** Enter a descriptive name
- **TAC:** Enter a valid trunk access code
- **Dial Access:** Set this to **y**
- **Service Type:** Set this to **public-ntwrk**

add trunk-group 2		Page 1 of 21
TRUNK GROUP		
Group Number: 2	Group Type: isdn	CDR Reports: y
Group Name: NetCall Inbound	COR: 1	TN: 1 TAC: 102
Direction: two-way	Outgoing Display? n	Carrier Medium:
PRI/BRI		
Dial Access? y	Busy Threshold: 255	Night Service:
Queue Length: 0		
Service Type: public-ntwrk	Auth Code? n	TestCall ITC: rest
	Far End Test Line No:	
TestCall BCC: 4		

On **Page 2** configure the fields as follows:

- **Supplementary Service Protocol:** Enter **c** to use the ETSI protocol
- **Trunk Hunt:** Enter **ascend**
- **Disconnect Supervision:** Enter **y** in both **In** and **Out** fields

add trunk-group 2		Page 2 of 21
Group Type: isdn		
TRUNK PARAMETERS		
Codeset to Send Display: 6	Codeset to Send National IEs: 6	
Max Message Size to Send: 260	Charge Advice: none	
Supplementary Service Protocol: c	Digit Handling (in/out): enbloc/enbloc	
Trunk Hunt: ascend		
	Digital Loss Group: 13	
Incoming Calling Number - Delete:	Insert:	Format:
Bit Rate: 1200	Synchronization: async	Duplex: full
Disconnect Supervision - In? y Out? y		
Answer Supervision Timeout: 0		
Administer Timers? n	CONNECT Reliable When Call Leaves ISDN? n	

4.2.3 Signaling Groups

Two signaling groups are used, one for each DS-1 board. Both are configured in the same way. Use the **add signaling-group x** command, where **x** is an available signaling group number. On **Page 1** configure the fields as follows:

- **Group Type:** Enter **isdn-pri**.
- **Primary D-Channel:** Enter **x16**, where **x** is the slot number of the previously configured DS-1 board as in **Section 4.2.1**.
- **Trunk Group for Channel Selection:** Enter one of the trunk groups that will be configured on the DS-1 that this signaling group serves.
- **TSC Supplementary Service Protocol:** Enter **c**

add signaling-group 2		Page 1 of 5
SIGNALING GROUP		
Group Number: 2	Group Type: isdn-pri	
Associated Signaling? y	Max number of NCA TSC: 0	
Primary D-Channel: 01a0916	Max number of CA TSC: 0	
	Trunk Group for NCA TSC:	
Trunk Group for Channel Selection: 2		
TSC Supplementary Service Protocol: c		

4.2.4 Set DS-1 Ports

The final step is to assign the DS-1 ports to the trunk groups. This is detailed in **Table 2, Section 4.2**.

- **Inbound Trunk Group:** Assign ports 1 – 6 of the internal DS-1 to ports 1-6 on the inbound trunk group form. Enter the signaling group of the internal DS-1 in the **Sig Grp** field for each trunk.
- **Agent Trunk Group:** Assign ports 7 – 31 (omitting 16) of the internal DS-1 to ports 1-24 on the agent trunk group form. Enter the signaling group of the internal DS-1 in the **Sig Grp** field for each trunk.
- **Outbound Trunk Group:** Assign ports 1 – 31 (omitting 16) of the external DS-1 to ports 1-30 on the outbound trunk group form. Enter the signaling group of the external DS-1 in the **Sig Grp** field for each trunk.

Use the **change trunk-group x** command, where **x** is the number of the trunk group to be configured. On **Page 5** assign ports as follows:

- **Port:** Enter in the DS1 board number followed by the trunk member number. In this case the first 6 port numbers on the DS-1(01a09)card are assigned to trunk group 2
- **Code:** This is automatically assigned once the port has been added
- **Sfx:** This is automatically assigned once the port has been added
- **Sig Grp:** Enter the signaling group configured for the DS1 board 01a09. In this case it is trunk group 2.

change trunk-group 2						Page 5 of 21	
						TRUNK GROUP	
						Administered Members (min/max): 0/0	
GROUP MEMBER ASSIGNMENTS						Total Administered Members: 0	
	Port	Code	Sfx	Name	Night	Sig	Grp
1:	01a0901	TN2464	B			2	
2:	01a0902	TN2464	B			2	
3:	01a0903	TN2464	B			2	
4:	01a0904	TN2464	B			2	
5:	01a0905	TN2464	B			2	
6:	01a0906	TN2464	B			2	

Repeat this command for each of the Agent and Outbound trunk groups and assign the group members as specified above. When all are complete run the command **list trunk-group** command. Note that the **No. Mem** corresponds to the number of ports\members set up for each trunk group.

list trunk-group											
TRUNK GROUPS											
Grp						No.				Out	Que
No.	TAC	Group	Type	Group	Name	Mem	TN	COR	CDR	Meas	Dsp Len
1	101	isdn		ToCM2		5	1	1	y	none	y 0
2	102	isdn		NetCall Inbound		6	1	1	y	none	n 0
3	103	isdn		NetCall Agent		24	1	1	y	none	n 0
4	104	isdn		NetCall Outbound		30	1	1	y	none	n 0

4.3 Administer Call Routing

During the compliance testing, Automatic Alternate Routing (AAR) was used to route calls from the Communication Manager vector over the QueueBuster inbound trunk. To achieve this, firstly use the **change dialplan analysis** command to add an entry. The number **118** was used in the inbound vector to route to QueueBuster therefore the dialplan was configured by setting the following values. **Dialed String** was set to **11**, **Total Length** to **3**, **Call Type** to **aar**.

change dialplan analysis							Page 1 of 12		
DIAL PLAN ANALYSIS TABLE									
Location: all							Percent Full: 1		
	Dialed String	Total Length	Call Type	Dialed String	Total Length	Call Type	Dialed String	Total Length	Call Type
1		3	dac						
11		3	aar						
18		4	ext						
25		4	ars						
3		4	ext						
34		4	ext						
40		4	aar						
50		4	ext						
60		4	ext						
9		1	fac						
*		3	fac						
#		2	fac						

Next, use the **change aar analysis 0** command to add an entry as follows:

- **Dialed String:** Enter the complete string used to dial QueueBuster
- **Total:** Enter the total number of digits used to dial QueueBuster in both **Min** and **Max** fields
- **Route Pattern:** Enter an available route-pattern number
- **Call Type:** aar

change aar analysis 0							Page 1 of 2	
AAR DIGIT ANALYSIS TABLE								
Location: all					Percent Full:		1	
	Dialed	Total		Route	Call	Node	ANI	
	String	Min	Max	Pattern	Type	Num	Reqd	
118		3	3	11	aar		n	
119		3	3	12	aar		n	
2		7	7	999	aar		n	
3		7	7	999	aar		n	
40		4	4	1	aar		n	
5		7	7	999	aar		n	
6		7	7	999	aar		n	
7		7	7	999	aar		n	
8		7	7	999	aar		n	
9		7	7	999	aar		n	

Next, use the **change route-pattern x** command, where **x** is the route pattern entered in the previous step. Configure the fields on **Page 1** as follows:

- **Pattern Name:** Enter any descriptive name, in this case, **QB Inbound**
- **Grp No:** Enter the number of the inbound trunk-group, which is **2**
- **FRL:** Enter in value **0**

change route-pattern 11													Page 1 of 3							
Pattern Number: 11													Pattern Name: QB Inbound							
Secure SIP? n																				
Grp	FRL	NPA	Pfx	Hop	Toll	No.	Inserted						DCS/	IXC						
No			Mrk	Lmt	List	Del	Digits						QSIG							
							Dgts						Intw							
1: 2	0												n	user						
2:													n	user						
3:													n	user						
4:													n	user						
5:													n	user						
6:													n	user						
		BCC		VALUE		TSC	CA-TSC		ITC		BCIE	Service/Feature		PARM	No.	Numbering	LAR			
		0	1	2	M	4	W	Request										Dgts	Format	
																	Subaddress			
1:	y	y	y	y	y	n	n	rest											none	
2:	y	y	y	y	y	n	n	rest											none	
3:	y	y	y	y	y	n	n	rest											none	
4:	y	y	y	y	y	n	n	rest											none	
5:	y	y	y	y	y	n	n	rest											none	
6:	y	y	y	y	y	n	n	rest											none	

Verify that the inbound number used, 118, will route to QueueBuster as expected. Use the command **list aar route-chosen 118#** and confirm that the **Route Pattern** used is **11** as set up in the previous step.

list aar route-chosen 118#						
AAR ROUTE CHOSEN REPORT						
Location: all				Partitioned Group Number: 1		
Dialed String	Total Min Max		Route Pattern	Call Type	Node Number	Location
118	3	3	11	aar		all
Actual Outpulsed Digits by Preference (leading 35 of maximum 42 digit)						
1:				9:		
2:				10:		
3:				11:		
4:				12:		
5:				13:		
6:				14:		
7:				15:		
8:				16:		

4.4 Administer VDNs, Vectors and Agents Logins

Two hunt groups, three Vector Directory Numbers (VDN), three vectors and two agent logins were created as indicated in the following table. These were created for testing purposes only.

	VDN	Vector	Skill\Hunt Group Extension	Trunk	Agent Login	Station logged in
Inbound(Incoming Calls)	1810	10	1 \ 3090	2	6001	3000
Agent(Calls from QB)	1820	20	2 \ 3091	3	6002	3001
Agent Re-Queue	1830	30	-	-	-	-

Table 3: Call Center Agent Details

- The first VDN/vector combination queues to an agent skill and gives the caller an option to be routed to QueueBuster. For the purposes of these Application Notes, this VDN/vector combination will be referred to as the Inbound VDN/vector.
- The second VDN/vector combination receives calls from QueueBuster and queues them for an available agent. For the purposes of these Application Notes, this VDN/vector combination will be referred to as the Agent VDN/vector.
- The third VDN/vector combination queues the call again if it has not been answered by the customer and this is referred to as the Agent Re-queue VDN/vector.

4.4.1 Configure Hunt Groups

Enter the **add hunt-group n** command; where **n** is an unused hunt group number. On Page 1 of the **hunt group** form, assign a **Group Name** and **Group Extension** valid under the provisioned dial plan. Set the following options to yes (**y**) as shown below.

- **ACD?** to **y**
- **Queue?** to **y**
- **Vector?** to **y**
- **Group Type** to **ucd-mia** to specify that the system hunts for the “most idle agent”.

add hunt-group 1		Page 1 of 3
HUNT GROUP		
Group Number: 1	ACD? y	
Group Name: Hunt Group 1	Queue? y	
Group Extension: 3090	Vector? y	
Group Type: ucd-mia		
TN: 1		
COR: 1	MM Early Answer? n	
Security Code:	Local Agent Preference? n	
ISDN/SIP Caller Display:		
Queue Limit: unlimited		
Calls Warning Threshold:	Port:	
Time Warning Threshold:	Port:	

On **Page 2** set **Skill?** to **y** to indicate that this is a skilled hunt group.

add hunt-group 1		Page 2 of 61
HUNT GROUP		
Skill? y	Expected Call Handling Time (sec): 180	
AAS? n		
Measured: none		
Supervisor Extension:		
Controlling Adjunct: none		
Redirect on No Answer (rings):		
Redirect to VDN:		
Forced Entry of Stroke Counts or Call Work Codes? N		
Redirect on No Answer (rings):		
Redirect to VDN:		
Forced Entry of Stroke Counts or Call Work Codes? n		

4.4.2 Configure Vectors

Enter the **add vector n** command; where **n** is associated to hunt group 1. **Vector number 10** was configured for inbound calls. Enter the vector steps to queue to the 1st skill on the VDN as shown below. Set the name to **Inbound** and enter in appropriate steps. This vector requires an **announcement** step as this sends a D-Channel “connected” event, which is required by QueueBuster. The vector queues the call to **skill 1** and then uses a **collect** step which asks the caller to dial **1** for QueueBuster. A **route-to** step is used to route the calls into QueueBuster (if the caller had dialed 1). This inbound vector was used for compliance testing and may be modified for different call treatments.

change vector 10					Page 1 of 6	
CALL VECTOR						
Number: 10		Name: Inbound				
					Lock? n	
Basic? y	EAS? y	G3V4 Enhanced? y	ANI/II-Digits? y	ASAI Routing? y		
Prompting? y	LAI? y	G3V4 Adv Route? y	CINFO? y	BSR? y	Holidays? y	
Variables? y	3.0 Enhanced? y					
01 wait-time	2	secs hearing ringback				
02 announcement	3100					
03 queue-to	skill 1	pri m				
04 collect	1	digits after announcement 3200			for none	
05 route-to	number 118	with cov n if digit			= 1	
06 disconnect	after announcement 3300					

Repeat the steps to create an agent queue vector. The agent vector requires an **announcement** step as this sends a D-Channel “connected” event, which is required by QueueBuster. Use a **queue-to** step to route the calls initiated by QueueBuster to agents. The screen below shows an example agent vector which may be modified for different call treatments.

change vector 20					Page	1 of	6
CALL VECTOR							
Number: 20		Name: Agent					
						Lock?	n
Basic? y	EAS? y	G3V4 Enhanced? y	ANI/II-Digits? y	ASAI Routing? y			
Prompting? y	LAI? n	G3V4 Adv Route? y	CINFO? y	BSR? y	Holidays? y		
Variables? y	3.0 Enhanced? y						
01 wait-time	2	secs hearing ringback					
02 announcement	3100						
03 queue-to	skill 2	pri m					
04 stop							

The announcements for the vectors are set up in **Section 4.6**.

4.4.3 Configure Agent VDNs

The VDN's are configured in the same way. Use the **add vdn n** command to create a Vector Directory Number extension which can be used to reference the inbound vector. Set the values **Name*** and **Destination: Vector Number 10** by referencing **Table 3, Section 4.4** above. The **1st Skill*** is set to **1**.

add vdn 1810	Page 1 of 3
VECTOR DIRECTORY NUMBER	
Extension: 1810	
Name*: QB	
Destination: Vector Number 10	
Allow VDN Override? n	
COR: 1	
TN*: 1	
Measured: none	
1st Skill*: 1	
2nd Skill*:	
3rd Skill*:	

The VDN's are used in the configuration of QueueBuster as referenced in **Section 5.2**.

4.4.4 Configure Agent Logins

Use the **add agent-loginID n** command; where **n** is a valid extension under the provisioned dialplan. Two agents are created as in **Table 3 Section 4.4**. The agent Login ID chosen is **6001**. On **Page 1** enter a descriptive name for the agent in the **Name** field and set **Password** to **6001**.

add agent-loginID 6001	Page 1 of 2
AGENT LOGINID	
Login ID: 6001	AAS? n
Name: AgentB	AUDIX? n
TN: 1	LWC Reception: spe
COR: 2	LWC Log External Calls? n
Coverage Path:	AUDIX Name for Messaging:
Security Code:	LoginID for ISDN/SIP Display? n
	Password: 6001
	Password (enter again): 6001
	Auto Answer: station
	MIA Across Skills: system
	ACW Agent Considered Idle: system
	Aux Work Reason Code Type: system

On **Page 2**, specify the list of skills assigned to the login and the skill level for each of them in the **SN/SL** field as shown below. Set the Skill Number (**SN**) to **1**, it should be the same as that configured for the associated vector number. The Skill Level (**SL**) is set to **1**. Repeat as **Skill Number** is set to **2**.

change agent-loginID 6001										Page 2 of 2	
										AGENT LOGINID	
Direct Agent Skill:										Service Objective? n	
Call Handling Preference: skill-level										Local Call Preference? n	
SN	RL	SL		SN	RL	SL		SN	RL	SL	
1: 1		1		16:				31:			
2: 2		1		17:				32:			
3:				18:				33:			
								46:			
								47:			
								48:			

4.5 Configure Feature Access Codes

Use the **change feature-access-codes** command to configure all of the access codes shown in the table below.

Parameter	Usage	FAC
Auto-in	This is used by the agent to indicate readiness.	#2
Login	Agent login.	#5
Logout	Agent logout.	#6
Auto Route Selection (ARS)	Dial out via ARS	9
Announcement Access Code	Create announcements	*56

Table 4: Feature Access Codes

QueueBuster needs to be able to dial out via Communication Manager using the Automatic Route Selection (ARS) feature access code.

On **Page 1** enter in a value in the **Auto Route Selection (ARS) – Access Code 1:** field. Note that this value may vary. For the compliance testing **9** was used for the ARS feature access code. The **Announcement Access Code** is set to ***56**. This is required to set up announcements and is covered in **Section 4.6**.

change feature-access-codes	Page 1 of 8
FEATURE ACCESS CODE (FAC)	
Abbreviated Dialing List1 Access Code:	
Abbreviated Dialing List2 Access Code:	
Abbreviated Dialing List3 Access Code:	
Abbreviated Dial - Prgm Group List Access Code:	
Announcement Access Code: *56	
Answer Back Access Code:	
Attendant Access Code:	
Auto Alternate Routing (AAR) Access Code:	
Auto Route Selection (ARS) - Access Code 1: 9	Access Code 2:
Automatic Callback Activation:	Deactivation:
Call Forwarding Activation Busy/DA: All:	Deactivation:
Call Forwarding Enhanced Status: Act:	Deactivation:
Call Park Access Code:	
Call Pickup Access Code:	
CAS Remote Hold/Answer Hold-Unhold Access Code:	
CDR Account Code Access Code:	
Change COR Access Code:	
ConditioContact Closure AAOpen Code:	DeClose Code:

On **Page 5** set the access codes as indicated in **Table 4** above. These allow the agents to log in and log out of stations and to set their status to auto-in. The **Auto-In Access Code** is set to **#2**, the **Login Access Code** is set to **#6** and the **Logout Access Code** is set to **#5**.

change feature-access-codes	Page 5 of 8
FEATURE ACCESS CODE (FAC)	
Automatic Call Distribution Features	
After Call Work Access Code:	
Assist Access Code:	
Auto-In Access Code: #2	
Aux Work Access Code:	
Login Access Code: #6	
Logout Access Code: #5	
Manual-in Access Code:	
Service Observing Listen Only Access Code:	
Service Observing Listen/Talk Access Code:	
Service Observing No Talk Access Code: #3	
Add Agent Skill Access Code:	
Remove Agent Skill Access Code:	
Remote Logout of Agent Access Code:	

4.6 Set up Announcements on the G650 Announcement Board

Configure three announcements for the messages that will be used by the vectors set up in Communication Manager that allow routing to QueueBuster. Enter the **change announcement n** command, where **n** is an announcement number. This is the extension where the announcement is recorded. Set the following values:

- **Annc Name:** Enter the name of the wav file on the announcement board that will play the announcement.
- **Annc Type:** Set this value to **integrated**.
- **Group/Board:** This is the announcement board number on the G650 Gateway, in this case it is **01A08**.
- **Protected?** Set this value to **n**.

change announcement 3200		Page 1 of 1
ANNOUNCEMENTS/AUDIO SOURCES		
Extension: 3200	COR: 1	
Annc Name: Greeting_1st_Hold	TN: 1	
Annc Type: integrated	Queue? y	
Group/Board: 01A08		
Protected? n	Rate: 64	

Repeat these steps to create the other announcements.

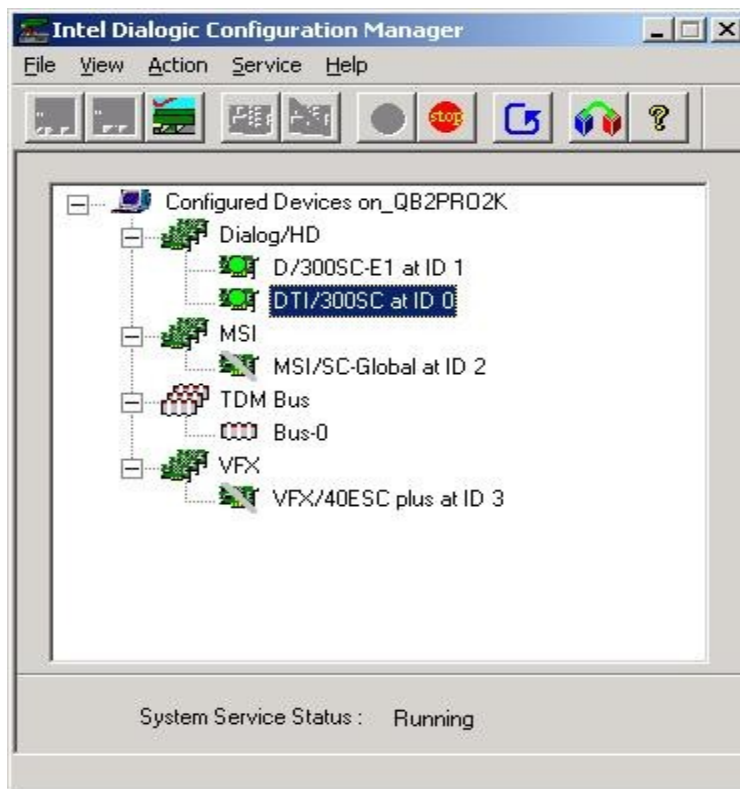
5 Configure QueueBuster

This section provides the procedures for configuring Netcall QueueBuster. The procedures include the following areas:

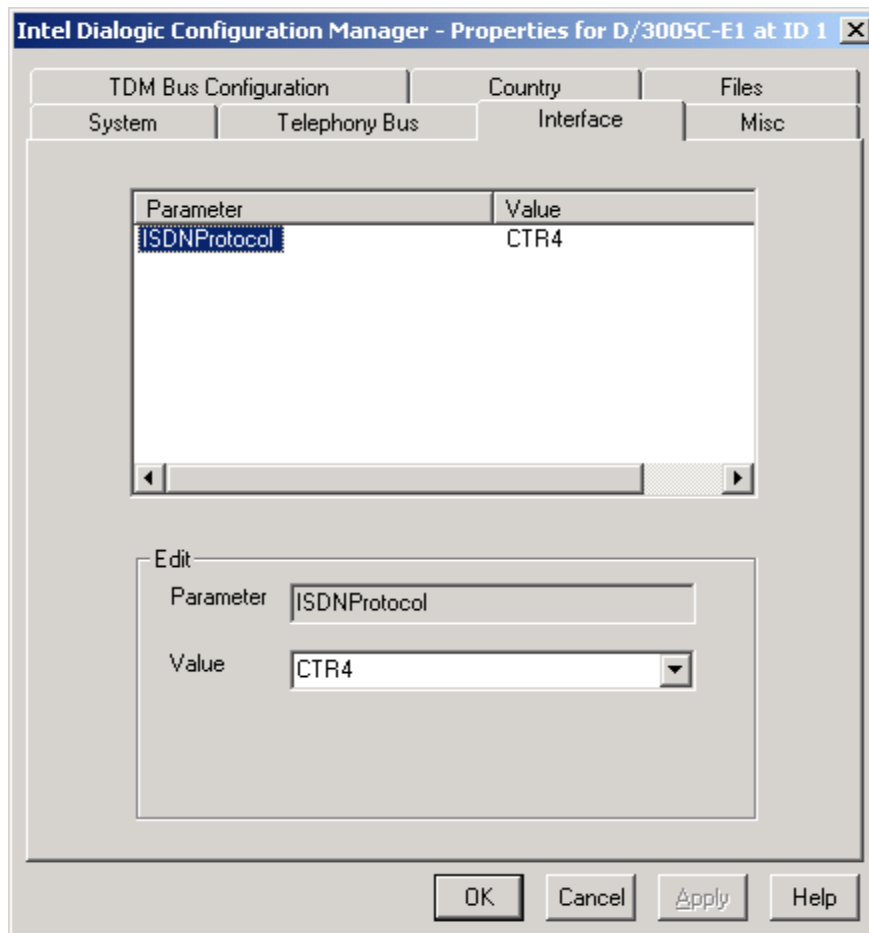
- Administer the Dialogic board
- Administer QueueBuster

5.1 Administer the Dialogic Board

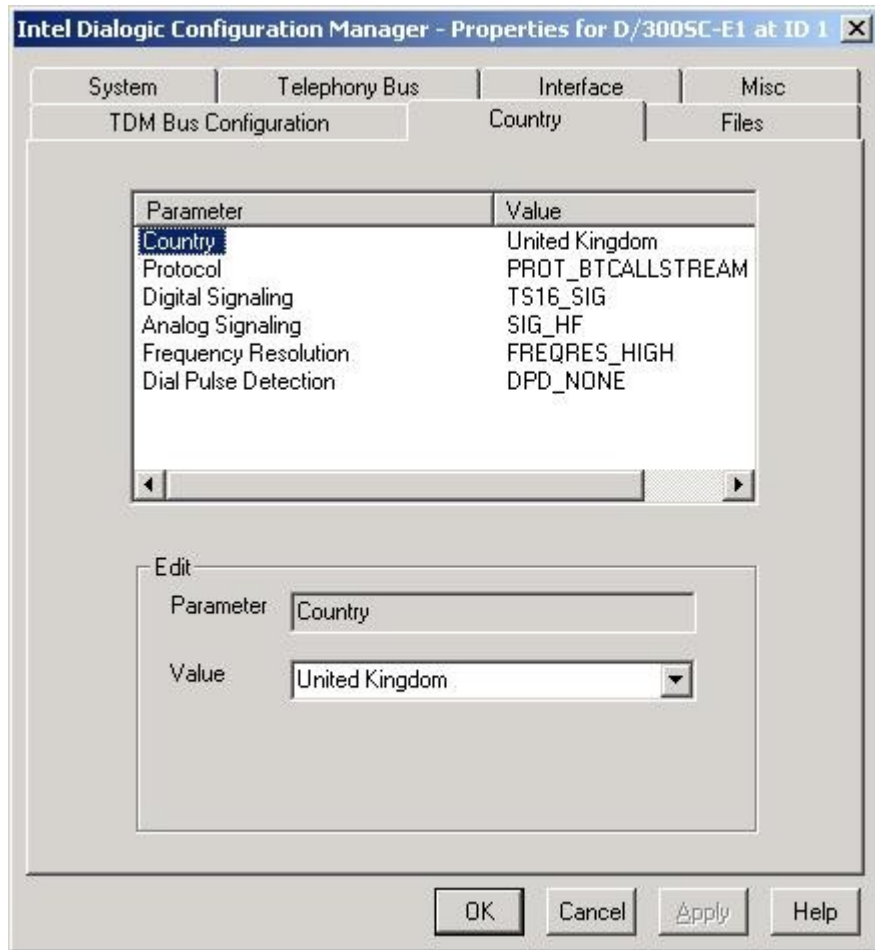
On the ICP server running QueueBuster, open the Dialogic Configuration Manager (DCM) located at the file path **Program Files\Dialogic\BIN\NCM.exe** on the drive where the application was installed.



Right-click on the required board, select **Configure device** from the drop-down menu. In the **Properties** dialogue box, click on the **Interface** tab and set the protocol for each interface to **CTR4**.



Next, click on the **Country** tab and ensure that the **Country** parameter is set to the country where the application is installed, then click **OK**.

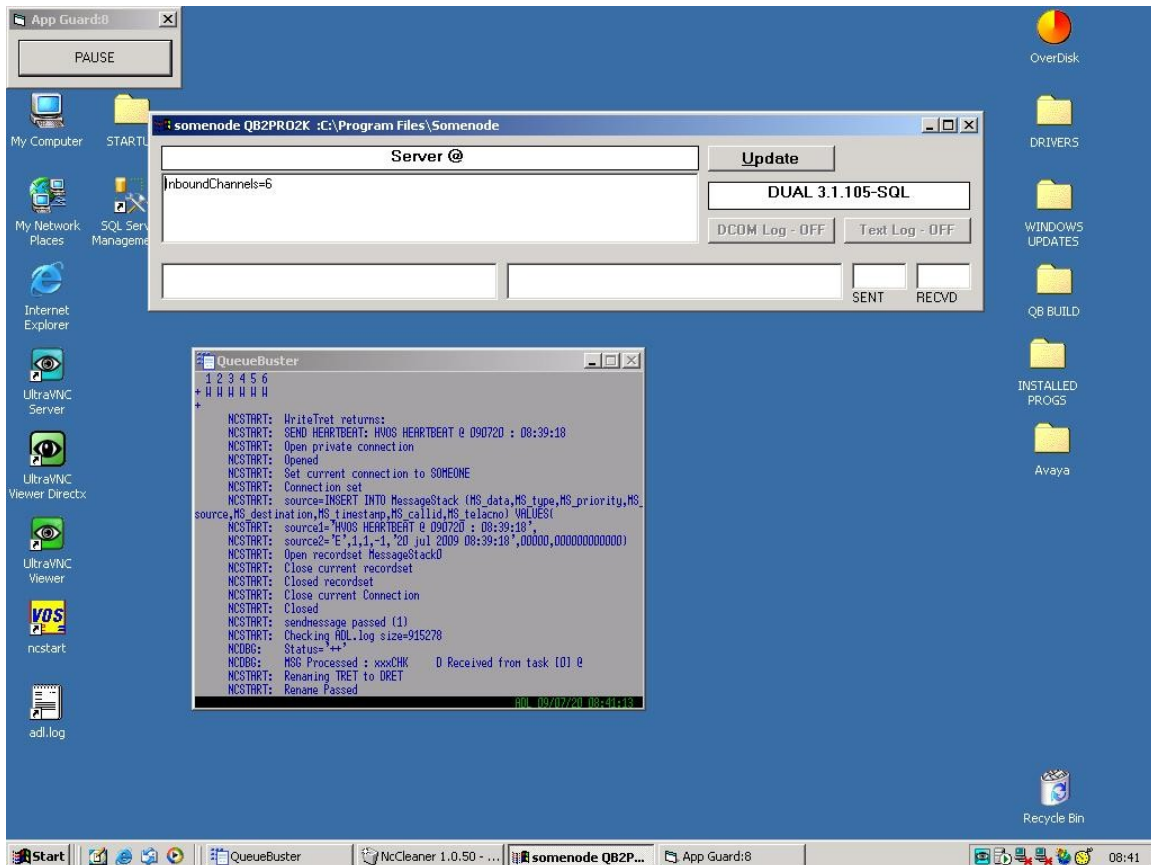


At this point, the Dialogic card is configured. If any changes are made to the configuration of the card, the card should be restarted using the **stop** and **start** buttons on the left side of the DCM taskbar.



5.2 Administer QueueBuster

QueueBuster will start automatically on booting the ICP server. If QueueBuster needs to be started manually, open the Windows **Start** menu and select **Programs → Startup → Executiv**. Once started the following components of QueueBuster should appear on the desktop: **AppGuard**, **somenode**, **QueueBuster** and **NCCleaner**. **NCCleaner** is not shown in the screen below.



To start administering QueueBuster, open a browser window and enter the following into the address bar: **http://hostname/cc** where **hostname** is the hostname of the ICP server. The **Enter Network Password** dialog box will appear (not shown). Log in using an appropriate user name and password.

The **ICP Control Centre** main menu now loads.

netcall
your call is our call

Callboard Reports Graphs Maintenance System Admin

Summary telacno

Inbound Calls
Queuing Calls Talking to Agents
Offline Queue Scheduled Calls

Your maximum total calls is 24

Menu-less Window

Summary:	Inbound Queue	0 minutes	0
	Outbound Queue	0 minutes	0
	Offline Queue	0 minutes	0
	Scheduled Calls		0

Next, select **Maintenance → Destination** to bring up the **Destinations** page. Select **Add New Destination**.

netcall
your call is our call

Callboard Reports Graphs Maintenance System Admin

Destination Group Inbound Numbers Queue Configuration Scheduled Calls Voice Prompts Voice Notes

Destinations

Destination Name	Destination	Group	Queue Telephone	Max Calls	Action
Customer Service	17	QueueBuster	Advanced Routing (See profile)	24	Edit Delete Phonebook

[Add New Destination](#)

This brings up the **Destination Maintenance** page. Configure the following fields and leave the rest at their default values.

- **Destination:** Enter a descriptive name for the destination
- **Queue Number:** Enter the agent VDN number configured in **Section 4.4.3**.
- **Max Calls:** Set this to maximum number of calls that can be made

Choose **Update**.

netcall
your call is our call

Callboard Reports Graphs Maintenance System Admin

Destination Group Inbound Numbers Queue Configuration Scheduled Calls Voice Prompts Voice Notes


Destination maintenance

Destination settings:

Destination Name	Avaya
Destination Ref	17
Queue Number	1820
Max Calls	24 (24)

Update Cancel

A new screen displays the **Destination Maintenance** parameters. Accept the default values but change the value **Allow repeat callers ?** to **Yes** for the compliance testing to allow the same ANI to call into QueueBuster more than once.



Callboard

Reports

Graphs

Maintenance

System

Extra Features

Admin

Destination

Group

Inbound Numbers

Queue Configuration

Scheduled Calls

Voice Prompts

Voice Notes

Destination Maintenance

Destination Settings:

Destination nameAvaya

Destination ref17

GroupQueueBuster

Queue timeout160 minutes

Answer timeout120 minutes

Clear down time0 minutes

Max calls24

Current System capacity: 24

Routing Options (24x7)

Change routing mode

Switch to Advanced Routing

Edit Phonebook

Destination NumberCall Queue (1820)

Agent settings:

Retry agent failures60 times, with a 1 minute interval

Agent detectOne to accept

Agent call reschedulingOff

Caller settings:

Retry unavailable callers3 times, with a 15 minute interval

Maximum length of call (Mins)120 Set this to 0 for no limit

Bar mobile callers ?No

Allow repeat callers ?Yes

Offline queue settings:

Offline queue enabled ?

☐ Tick to enable

Type: In hours only

Feed to online queue0

Current max calls: 24

Offline queue limit0

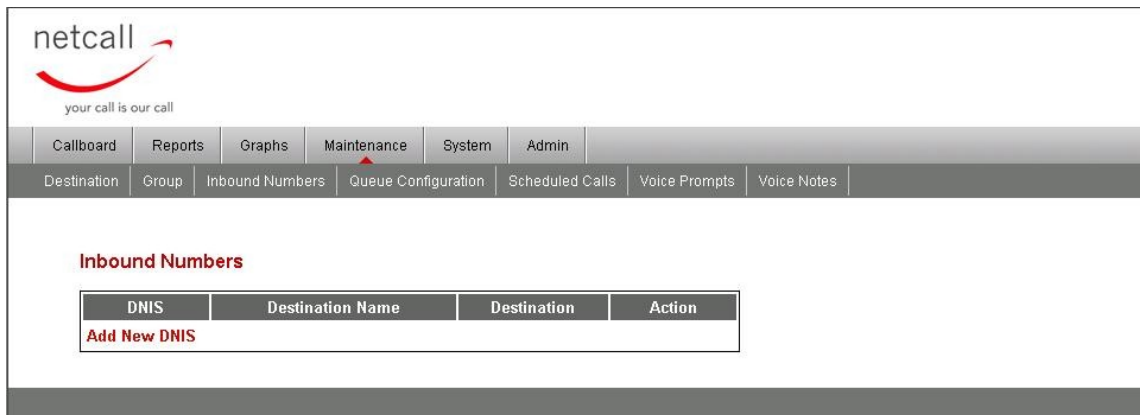
Global maximum: 30

Save/Cancel changes:

Save Changes

Cancel

QueueBuster is now configured for inbound calls. An incoming DNIS must be created and a destination added to it. Select **Maintenance→Inbound Numbers** from the menu. This brings up the **Inbound Numbers** page.



netcall
your call is our call

Callboard Reports Graphs Maintenance System Admin

Destination Group Inbound Numbers Queue Configuration Scheduled Calls Voice Prompts Voice Notes

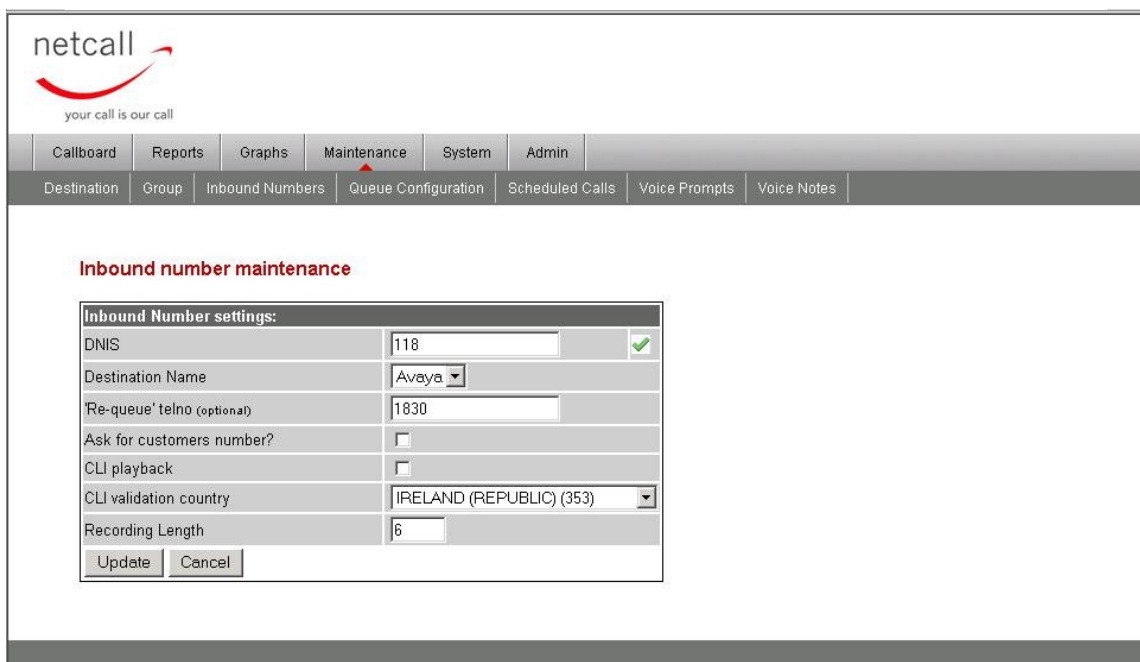
Inbound Numbers

DNIS	Destination Name	Destination	Action
Add New DNIS			

Select **Add New DNIS**. This brings up the **Inbound number maintenance** page. Configure the following fields and leave the rest at their default values.

- **DNIS:** Enter the call routing number for inbound calls as set up in **Section 4.3**
- **Destination Name:** Ensure this is set to the destination configured already in this section
- **Re-queue telno:** Set the VDN number to the Agent Re-Queue VDN, as referenced in **Table 3, Section 4.4**, to re-route the call
- **CLI validation country:** Ensure this is set to the country where the system is installed.

Once completed, click on the **Update** button at the bottom of the form.



netcall
your call is our call

Callboard Reports Graphs Maintenance System Admin

Destination Group Inbound Numbers Queue Configuration Scheduled Calls Voice Prompts Voice Notes

Inbound number maintenance

Inbound Number settings:

DNIS	118	✓
Destination Name	Avaya	
Re-queue telno (optional)	1830	
Ask for customers number?	<input type="checkbox"/>	
CLI playback	<input type="checkbox"/>	
CLI validation country	IRELAND (REPUBLIC) (353)	
Recording Length	6	

Update Cancel

Select **System → General** to open up the **General System Settings** page. On this page ensure that the **System Country** field is set to the country where the system is installed and that the **Dialout Prefix setting** field is set to match the Auto Route Selection (ARS) feature access code in Communication Manager, configured in **Section 4.5**. Leave the remaining fields at their default values. Once the form is completed, click on the **Save Changes** button at the bottom of the form.

The screenshot shows the Netcall web interface. At the top is the Netcall logo with the tagline 'your call is our call'. Below the logo is a navigation bar with tabs: Callboard, Reports, Graphs, Maintenance, System (selected), and Admin. Under the 'System' tab, there is a sub-tab 'General'. The main content area is titled 'General System Settings' and contains a form with the following fields:

General System Settings	
System Country	IRELAND (REPUBLIC) (353)
Background Dialing	No
Voice Detect Settings	Don't monitor first 0 seconds. Detect on 0 hits in 0 samples.
Dialout Prefix setting	9
Caller survival time	0 seconds
Save Changes	

6 General Test Approach and Test Results

The interoperability compliance test included both feature and serviceability testing. The feature testing focused on verifying Netcall QueueBuster's ability to request and respond to Communication Manager features including:

- Inbound calls into QueueBuster
- Call-back calls made from QueueBuster using the original ANI and using different numbers entered by the caller.

The serviceability testing focused on verifying Netcall QueueBuster's ability to recover from an outage condition, such as disconnecting the E1 link, shutdown of each of the QueueBuster application and Avaya Aura Communication Manager. All feature and serviceability test cases were performed manually. The verification included checking call states at the stations, QueueBuster logs and Communication Manager traces. All feature and serviceability test cases passed successfully. The test plan details the results and contains a complete summary report.

7 Verification Steps

This section provides the tests that can be performed to verify proper configuration of Communication Manager and Netcall QueueBuster.

7.1 Verify Communication Manager

Use the **status trunk x** command, where **x** is one of the trunk groups used by QueueBuster, verify that the status of each trunk in the group is **in service/idle**.

```
status trunk 2

TRUNK GROUP STATUS

Member    Port      Service State    Mtce Connected Ports
                               Busy
0002/001  01A0901    in-service/idle    no
0002/002  01A0902    in-service/idle    no
0002/003  01A0903    in-service/idle    no
0002/004  01A0904    in-service/idle    no
0002/005  01A0905    in-service/idle    no
0002/006  01A0906    in-service/idle    no
```

7.2 Verify Netcall QueueBuster

Open the file “vosnt\exe\ADL.log” on the drive where QueueBuster is installed, and verify that the E1 links are up by searching for the most recent **NCDBG** line with a status of **++**. Each **+** represents an E1 link that is in service. An out of service E1 link would be represented by a **-**.

```
090722 000145.39 NCDBG:d699[1] NCDBG: Status='++'
090722 000145.39 NCDBG:7f8a[1] NCDBG: MSG Processed : xxxCHK D Received from task [0] @ 090721203729
090722 000145.59 ncstart:9029[0] NCSTART: Renaming TRET to DRET
090722 000145.59 ncstart:90d7[0] NCSTART: Rename Passed
090722 000346.33 ncstart:c545[0] NCSTART: Send alert: HVOS HEARTBEAT @ 090722 : 00:03:46
090722 000346.33 ncstart:c5aa[0] NCSTART: WriteTret returns:
090722 000346.33 ncstart:9c1b[0] NCSTART: SEND HEARTBEAT: HVOS HEARTBEAT @ 090722 : 00:03:46
090722 000346.33 ncstart:d4d7[0] NCSTART: Open private connection
090722 000346.39 ncstart:d58b[0] NCSTART: Opened
090722 000346.39 ncstart:d0b3[0] NCSTART: Set current connection to SOMEONE
090722 000346.39 ncstart:d172[0] NCSTART: Connection set
090722 000346.39 ncstart:ca5d[0] NCSTART: source=INSERT INTO MessageStack (MS_data,MS_type,MS_priority,MS_source,
090722 000346.39 ncstart:ca97[0] NCSTART: source1='HVOS HEARTBEAT @ 090722 : 00:03:46'
090722 000346.39 ncstart:cad1[0] NCSTART: source2='E',1,1,-1,'22 jul 2009 00:03:46',00000,00000000000000)
090722 000346.39 ncstart:cb4d[0] NCSTART: Open recordset MessageStack0
090722 000346.39 ncstart:cc58[0] NCSTART: Close current recordset
090722 000346.39 ncstart:cd19[0] NCSTART: Closed recordset
090722 000346.39 ncstart:d23c[0] NCSTART: Close current Connection
090722 000346.40 ncstart:d40f[0] NCSTART: Closed
090722 000346.40 ncstart:c253[0] NCSTART: sendmessage passed (1)
090722 000346.40 ncstart:8de3[0] NCSTART: Checking ADL log size=986
090722 000346.40 NCDBG:d699[1] NCDBG: Status='++'
090722 000346.40 NCDBG:7f8a[1] NCDBG: MSG Processed : xxxCHK D Received from task [0] @ 090721203729
```

8 Conclusion

These Application Notes describe the configuration steps required for successful interoperability of Netcall QueueBuster with Communication Manager using E1 trunks. All feature and serviceability test cases were completed successfully.

9 Additional References

This section references the product documentation that is relevant to these Application Notes. Product documentation for Avaya products may be found at <http://support.avaya.com>

1. *Administering Avaya Aura™ Communication Manager*, Doc ID 03-300509, May 2009
2. The *QueueBuster User Guide* can be downloaded from the QueueBuster Customer Area (password required), available at: <http://www.hyperphonenumber.com/NetCallWebInterface/Netcall/Engine/Load.aspx>.

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