

LightLink Data Source Installation Guide

Avaya Aura Contact Center RTD

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1. Introduction

Inova Solutions is a global provider of real-time reporting, alerting and display solutions for contact centers. Inova helps customers identify and measure contact center KPIs, quickly react when KPIs fall out of compliance, and gain insight into the relationship between the call center and overall organizational performance.

Inova's contact center solutions are built on Inova LightLink®, a powerful middleware that extracts, calculates, and unifies data from multiple contact center and enterprise operating systems and prepares it for display to an array of output options. Visual output options include LCD and LED digital signage and wallboards, agent desktop applications, and web-based dashboards. LightLink also allows you to program KPI thresholds that trigger an alert, such as a message, text, email, color change, or audio notification, ensuring that you're instantly aware of changing conditions that need your attention. With these capabilities, LightLink-based solutions provide a foundation for contact center performance management by managing your center's data, unifying your reporting, and ensuring the right people receive the right information when and how they want to see it.

Inova's real-time solutions extend Avaya's reporting value and allow you to:

- Deliver unified real-time reporting across Avaya Aura® Call Center Elite and multi-vendor platforms
- Create custom KPIs that map to your organizational goals
- Integrate enterprise data to gauge the impact of your contact center on the top line

1.1. Executive Summary

The Inova LightLink interface to Avaya Aura Contact Center (formerly known as Nortel Contact Center Manager Server and Symposium Call Center Server) enables LightLink to retrieve an extensive array of data for real-time processing and display. LightLink can connect to Avaya Aura and many other ACD products in the event of a technology refresh.

Inova LightLink communicates with Avaya Aura CCMS through Avaya Aura's Real-Time Data (RTD) Toolkit. LightLink queries the Avaya Aura tables, located on the CCMS server, using the RTD SDK which encloses an API, via standard TCP/IP connections. This process allows current call data to be displayed on any of the output devices supported by the LightLink system.

2. Data Source Specifications

2.1. Available Report Tables

The Avaya Aura CCMS v6.4 RTD toolkit can be redistributed by Inova; this is the only toolkit that is supported with LightLink versions 5.11 and newer. Refer to Figure 1 for the tables that are available from the RTD interface.

<i>Interval to date statistics (starting from 100)</i>	
Table Name	Table #
Application	100
Skillset	101
Agent	102
Nodal	103
IVR	104
Route	105

<i>Moving window statistics</i>	
Table Name	Table #
Application	106
Skillset	107
Agent	108
Nodal	109
IVR	110
Route	111

Figure 1

The customer must tell Inova if they want to monitor Interval-to-date, Moving Window, or both for their selected data fields.

The following three tables include the data fields commonly monitored by LightLink. However, not all of these data fields in each of these tables are retrieved by the default LightLink configuration; the few data fields NOT retrieved by default have their Descriptions prefaced with an asterisk.

2.2. Application Table

Column Description	Column ID	Comments
Application ID	NIrtd_APPL_APPL_ID	KEY - A unique number to identify an application.
Calls Abandoned^a	NIrtd_APPL_CALLS_ABAN	Number of calls abandoned
Calls Abandoned After Threshold^a	NIrtd_APPL_CALLS_ABAN_AFT_THRESHOLD	Number of calls abandoned after reaching service level threshold
Calls Abandoned Delay^a	NIrtd_APPL_CALLS_ABAN_DELAY	Total delay of all calls abandoned
Calls Answered^a	NIrtd_APPL_CALLS_ANS	Number of calls answered

Column Description	Column ID	Comments
Calls Answered After Threshold^a	NIrtd_APPL_CALLS_ANS_AFT_THRESHOLD	Number of calls answered after reaching service level threshold
Calls Answered Delay^a	NIrtd_APPL_CALLS_ANS_DELAY	Total delay of all calls answered
Calls Waiting^a	NIrtd_APPL_CALLS_WAITING	Number of calls currently waiting
Max Waiting Time^a	NIrtd_APPL_MAX_WAITING_TIME	Amount of time the oldest call waiting has been in system
Waiting Time^a	NIrtd_APPL_WAITING_TIME	Total amount of time all calls in the system have been waiting
Calls Answered Delay At Skillset	NIrtd_APPL_CALLS_ANS_DELAY_AT_SKILLSET	Delay of all calls from the time they are queued against the first skillset until they are answered
Calls Given Termination Treatment	NIrtd_APPL_CALLS_GIVEN_TERMINATE	Calls terminated by: Given Force Busy, Force Overflow, Force Disconnect, Route to, or Default Reached a Non-ISDN trunk while being routed to a remote site Transferred in an IVR session Networked out through MACD queue
Calls Offered^a	NIrtd_APPL_CALLS_OFFER	Number of calls offered
Time Before Interflow (formerly Delay Before Interflow)	NIrtd_APPL_DELAY_BEF_INTERFLOW	Amount of time a call spent in the Master Application before interflowing to Primary Application
Network Out Calls^b	NIrtd_APPL_NETWORK_OUT_CALLS	Number of calls networked out
Network Out Calls Abandoned^b	NIrtd_APPL_NETWORK_OUT_ABAN	Number of outgoing network calls abandoned at destination sites
Network Out Calls Abandoned Delay^b	NIrtd_APPL_NETWORK_OUT_ABAN_DELAY	Total delay experienced by calls that were networked out and abandoned at destination sites
Network Out Calls Answered^b	NIrtd_APPL_NETWORK_OUT_ANS	Number of calls networked out and answered
Network Out Calls Answered Delay^b	NIrtd_APPL_NETWORK_OUT_ANS_DELAY	Total delay experienced by all calls networked out and answered
Network Out Calls Waiting^b	NIrtd_APPL_NETWORK_OUT_CALLS_WAITING	Number of local CDN call requests currently waiting at destination site(s)
*Network Out Calls Requested	NIrtd_APPL_NETWORK_OUT_CALLS_REQ	The number of network calls that were sent to another site

Table 1: Application Table

^a This statistic includes calls that originally entered the Contact Center Manager Server at this site and calls that were received at this site from the Contact Center Network. Delays are calculated from the time the call enters this site if it is a local CDN call or from the time the call is logically queued to this site if it is a network call.

^b Network Out statistics refer to calls that originally entered the Contact Center Manager Server at this site but were sent to another site on the Contact Center network. Delays for Network Out statistics are calculated from the time the call arrives at the source site to the time the call is treated (either answered, abandoned, or terminated) at the destination site.

2.3. Skillset Table

Column Description	Column ID	Comments
Skillset ID	NIrtd_SKLST_SKILLSET_ID	KEY
Agents Available	NIrtd_SKLST_AGENT_AVAIL	Number of agents waiting for a call and logged into this skillset
Agents In Service	NIrtd_SKLST_AGENT_IN_SERVICE	Number of agents logged in for this skillset
Agents on Skillset Calls	NIrtd_SKLST_AGENT_ON_ICCM_CALL	Number of agents currently on local and network CDN calls queued to this skillset
Agents Not Ready	NIrtd_SKLST_AGENT_NOT_READY	Number of agents currently in the Not Ready state logged into this skillset
Calls Waiting	NIrtd_SKLST_CALL_WAIT	Number of calls waiting for an agent in this skillset
Longest Waiting Time Since Last Call	NIrtd_SKLST_LONGEST_WAIT_TIMES_SINCE_LAST_CALL	Longest wait time for all idle agents waiting to answer a call in this skillset
Max Waiting Time	NIrtd_SKLST_MAX_WAIT_TIME	Amount of time oldest call currently waiting has been in skillset
Waiting Time	NIrtd_SKLST_TOT_WAIT_TIME	Total time all currently waiting calls in the skillset have been waiting
Expected Wait Time	NIrtd_SKLST_EXPECT_WAIT_TIME	Time a new call is expected to wait before being answered by an agent with this skillset
Calls Answered After Threshold	NIrtd_SKLST_CALL_ANS_AFT_THRESHOLD	Number of calls answered after waiting equal to or longer than the Service Level Threshold for this skillset

Column Description	Column ID	Comments
Longest Waiting Time Since Login	NIrttd_SKLST_LONGEST_WAIT_TIMES_SINCE_LOGIN	Longest waiting time of all idle agents who are currently waiting to answer calls for this skillset; this time is since login
Agents on DN Calls	NIrttd_SKLST_AGENT_ON_DN_CALL	Number of agents logged in for this skillset on a DN call
Skillset State	NIrttd_SKLST_SKILLSET_STATE	State of the skillset (In Service or Out of Service)
Agents Unavailable	NIrttd_SKLST_AGENT_UNAVAILABLE	Number of agents currently unavailable to take calls, based on: (#Agents in service) - (#Agents Available)
Network Calls Waiting	NIrttd_SKLST_NETWORK_CALL_WAIT	Number of incoming network CDN calls currently waiting at this skillset
Network Calls Answered	NIrttd_SKLST_NETWORK_CALL_ANS	Number of incoming network CDN calls answered by an agent assigned to this skillset
Total Calls Answered Delay	NIrttd_SKLST_TOT_ANS_DELAY	Total delay experienced by calls answered by an agent in this skillset from the time they were queued until they were answered (not applicable to ACD and NACD calls)
Total Calls Answered	NIrttd_SKLST_TOT_CALL_ANS	Total calls answered by an agent within this skillset
Agent On Network Skillset Call	NIrttd_SKLST_AGENT_ON_NETWORK_ICCM_CALL	Number of agents who are logged in for this Skillset and are currently handling network CDN calls assigned to this skillset
Agent On Other Skillset Call	NIrttd_SKLST_AGENT_ON_OTHER_ICCM_CALL	Number of agents who are logged in for this skillset but are active on other skillsets' calls
Agent On ACD-DN Call	NIrttd_SKLST_AGENT_ON_ACD_CALL	Number of agents who are logged in for this Skillset but are currently handling ACDDN calls
Agent On NACD-DN Call	NIrttd_SKLST_AGENT_ON_NACD_CALL	Number of agents who are logged in for this Skillset but are currently handling NACD-DN calls
Calls Offered	NIrttd_SKLST_CALL_OFFERED	Number of calls queued to this skillset; they might or might not be answered by this skillset

Column Description	Column ID	Comments
*Network Calls Offered	Nlrtcd_SKLST_NETWORK_CALL_OFFERED	The number of incoming network CDN calls queued to this skillset
SkillsetAbandon	Nlrtcd_SKLST_CALL_ABANDON	Number of calls that were abandoned by callers while being queued to this skillset
SkillsetAbandonDelay	Nlrtcd_SKLSET_CALL_ABANDONDELAY	Amount of delay experienced by calls that were abandoned by callers while being queued to this skillset; the time from when the call was queued until it was dequeued
SkillsetAbandonDelay AfterThreshold	Nlrtcd_SKLSET_CALL_ABANDONDELAY_AFTERTHRESHOLD	Number of calls whose SkillsetAbandonDelay values were greater than or equal to the service level threshold
Queued Call Answered	Nlrtcd_SKLSET_QUEUED_CALL_ANS	The number of queued calls that were answered for the skillset within the last interval-to-date or moving window

Table 2: Skillset Table

2.4. Agent Table

Column Description	Column ID	Comments
Agent ID	Nlrtcd_AGENT_AGENT_ID	A unique number to identify an agent. String value, KEY
State^{a, c}	Nlrtcd_AGENT_STATE	State the agent is currently in; see below for complete description
Supervisor ID	Nlrtcd_AGENT_SUPERVISOR_ID	Byte (17) String
Time In State	Nlrtcd_AGENT_TIME_IN_STATE	Total time agent has been in the indicated state (excluding DN states)
Answering Skillset	Nlrtcd_AGENT_ANS_SKILLSET	ID of the skillset in which the agent is currently answering a skillset call
DN In Time In State	Nlrtcd_AGENT_DN_IN_TIME_IN_STATE	Length of time the agent has been answering incoming DN calls
DN Out Time In State	Nlrtcd_AGENT_DN_OUT_TIME_IN_STATE	Length of time agent has been making outgoing DN calls
Supervisor User ID	Nlrtcd_AGENT_SUPERVISOR_USER_ID	BYTE (16) Buffer

Column Description	Column ID	Comments
Position ID	Nlrtd_AGENT_POSITION_ID	Unique identifier of the agent's position ID
Not Ready Reason Code High and Not Ready Reason Code Low	Nlrtd_AGENT_NOT_READY_REASON	Not Ready Reason Code entered by the agent
*DN Out Call Number High and DN Out Call Number Low	Nlrtd_AGENT_DN_OUT_CALL_NUM	The DN number dialed by an agent
Skillset Calls Answered	Nlrtd_AGENT_SKLST_CALL_ANS	Number of local and incoming network CDN calls answered by an agent
DN InCall Answered	Nlrtd_AGENT_DN_IN_CALL_ANS	Number of DN calls answered by an agent
DN OutCall Made	Nlrtd_AGENT_DN_OUT_CALL_	Number of DN calls made by an agent
*Answering Application	Nlrtd_AGENT_ANS_APP	A unique number to identify an application
Answering CDN Low and Answering CDN High	Nlrtd_AGENT_ANS_CD DN	A special directory number that allows incoming calls to be queued at a CDN when they arrive at the switch
*Answering DNIS Low and Answering DNIS High	Nlrtd_AGENT_ANS_DNIS	The phone number dialed by the incoming caller

Table 3: Agent Table

^aDMS connectivity differences: The following states are not available for DMS connectivity because hold event and consultation event are not reported:

- Consultation with out caller
- CDN call on hold and DN In/Out call on hold
- CDN call on hold and DN In/Out call active and on hold
- ACD call on hold and DN In/Out call active and on hold
- Not Ready and DN In/Out call on hold and active

The following agent state combinations are only valid for DMS connectivity because agents can be shown talking (active) on both the SDN and the In calls key (hold events are not reported by the DMS Interface):

- CDN call active and DN In/Out call active
- ACD call active and DN In/Out call active

Agent is shown as DN Out Call active, by only pressing the acquired SDN key. Agent is not shown on DN call if any of the non-acquired SDN keys are used.

^bFor M1 connectivity, an agent can be assigned multiple DN keys. Therefore an agent can be in a state that they are answering a DN call as well as placing another DN call on hold.

^cPossible values of “State” for agents:

- Undefined – the stat of agent is unknown
- Busy
- Not Ready – Not Ready key activated
- Waiting for CDN call
- Reserved for a call
- Skillset call active
- NACD call active
- ACD call active
- DN In/Out call active
- CDN call on hold
- NACD call on hold
- ACD call on hold
- DN In/Out call on hold
- DN In/Out call on hold and active^b
- CDN call active and DN In/Out call on hold
- NACD call active and DN In/Out call on hold
- ACD call active and DN In/Out call on hold
- CDN call on hold and DN In/Out call active
- CDN call on hold and DN In/Out call on hold
- CDN call on hold and DN In/Out call active and on hold
- NACD call on hold and DN In/Out call active
- NACD call on hold DN In/Out call active and on hold
- ACD call on hold and DN In/Out call active
- ACD call on hold DN In/Out call on hold
- ACD call on hold DN In/Out call active and on hold
- Not Ready and DN In/Out call active
- Not Ready and DN In/Out call on hold
- Not Ready and DN In/Out call on hold and active
- Consultation with out caller
- CDN call presented
- Emergency
- Walkaway or Walkaway combination with other states

There are three additional tables available in the Avaya Aura Contact Center RTD interface which we do not typically report: the Nodal table, IVR table, and Route table. Since they are not typically used in LightLink installs, their contents will not be covered in this document. Please refer to Avaya’s document “Avaya Aura Contact Center RTD API Programmers Guide” for the data reported from those tables.

3. Prerequisites

Inova Solutions requires the customer to provide the following information:

- IP Address/Host Name of the CCMS (not CCMA).
- User credentials for access. These are created on the CCMS, not the CCMA (thin-client credentials won't work).
- Tables required; Inova can monitor from 12 tables. Refer to Figure 1 for a list of the tables available from AACC CCMS / RTD.
- Specific data fields required. The tables in Section 2 show the data fields associated with each table from Figure 1, available in either/both Moving Window and/or Interval-to-date.
- Numbers and names of data required.
- The customer must tell Inova if they want to monitor Interval-to-date, Moving Window, or both for their selected data fields.

4. Product Specifications

4.1. Capacity and Limitations

LightLink can monitor up to 12 tables from AACC CCMS /RTD.

4.2. Compatibility

LightLink uses the Avaya Aura CCMS v6.4 RTD toolkit. According to Avaya, this toolkit version is backwards compatible to all versions of Avaya Aura and (previously) Nortel Symposium.

4.3. Licensing

The Avaya Aura CCMS v6.4 RTD toolkit can be redistributed by Inova; this is the only toolkit that is supported with LightLink versions 5.11 and newer.

The Avaya Aura RTD interface in LightLink is a separately licensed ACD connector.

4.4. Firewall

No firewall changes are expected to be needed for LightLink to connect to the Avaya Aura CCMS RTD.

5. Installation and Basic Configuration

For installation and configuration, you will choose either Automatic Installation (5.1) or Manual Installation (5.2). Once the installation is complete, you will need to Create and Customize Remaining Components (5.3) and Verify Launch (5.4).

5.1. Automatic Installation

Automatic installation is provided by the Inova wrapper to the Avaya RTDSDK installer. This file is available from the Inova Support Site and is named *Avaya Aura RTD Toolkit v6.4-Install_Configuration_Wizard*.

To run the automatic installer:

1. Launch the Avaya Aura RTD Toolkit Install & Configuration applet. Click *Next*.
2. If desired, change the destination location. This is the location of the RTD SDK installer file that will be run automatically in a later step. The default destination is shown in Figure 2, below. Click *Next*.

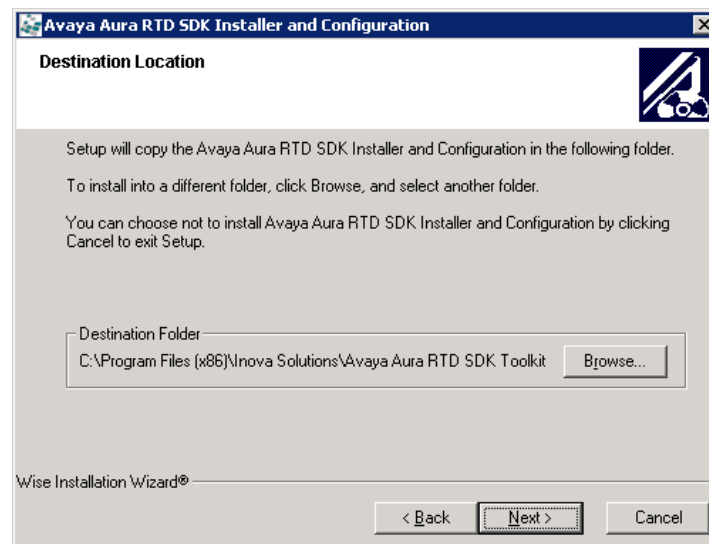


Figure 2

3. Click *Next* to begin the installation.
4. On the installation confirmation dialog, note the warning stating that you must select ANSI during the installation wizard. Click *Next*.
5. Click *Yes* to install the VS2008 C++ Runtime files. Even though the LightLink installer also installs them, there is no harm in making sure they are installed.
6. Select *Next* to confirm installation of the Avaya RTDSDK.
7. Verify that ANSI is selected as the Setup type (Figure 3) and then click *Next*.

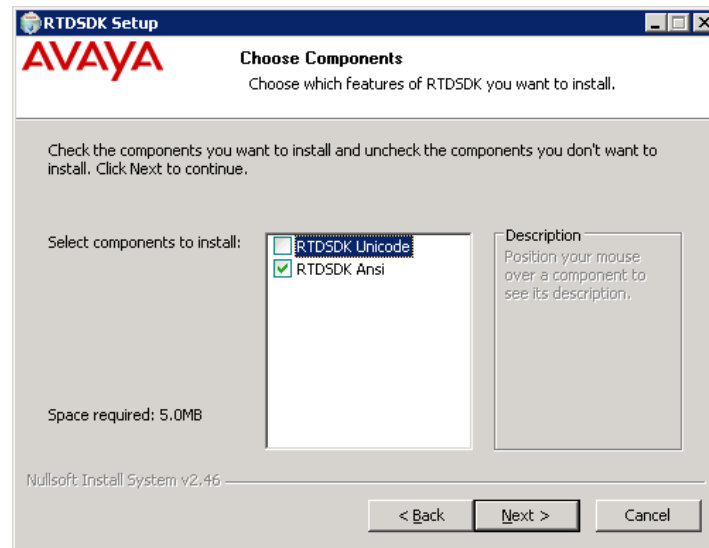


Figure 3

8. If desired, change the destination folder for the Avaya RTDSDK and click *Next*.
9. The Avaya RTDSDK installation wizard is complete. Click *Close*.
10. Click *OK* on the Toolkit Installed confirmation dialog.
11. Verify that the Host Name and IP Address of the host onto which the Avaya RTD SDK is installed are correct.
 - If they are, click *Yes*.
 - If the Host Name and IP Address are incorrect (for example, on a host with multiple NICs), click *No*. Manually enter the correct information in the appropriate fields (Figure 4) and click *Next*.

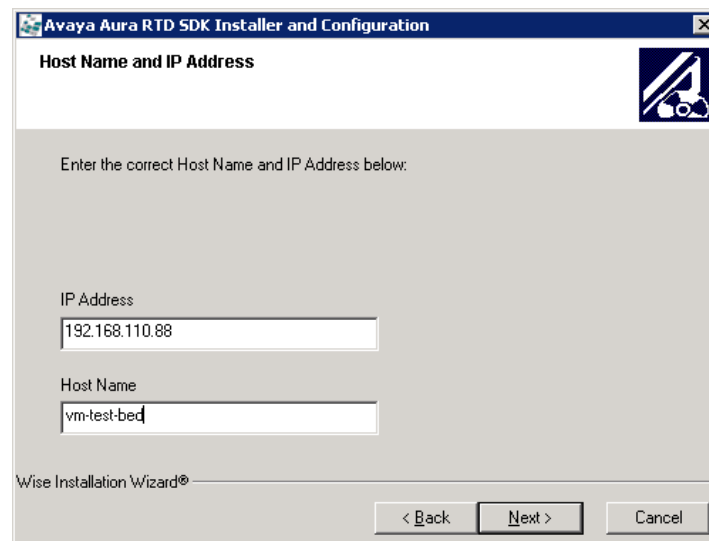


Figure 4

12. Click *Next* to place the Host Name and IP Address verified in the previous step into the Nortel registry key.
13. Click *OK* on the NICOMSETUP Result dialog. If it indicates a failure, you will have to re-run the installer.
14. Enter the Aura CCMS Login ID and Password.
15. Click the *Enter IP Address* button and enter the address of the Aura CCMS host in the IP Configuration dialog. Click *OK* on the IP Configuration dialog and then *Next* on the Installer dialog. (Figure 5)

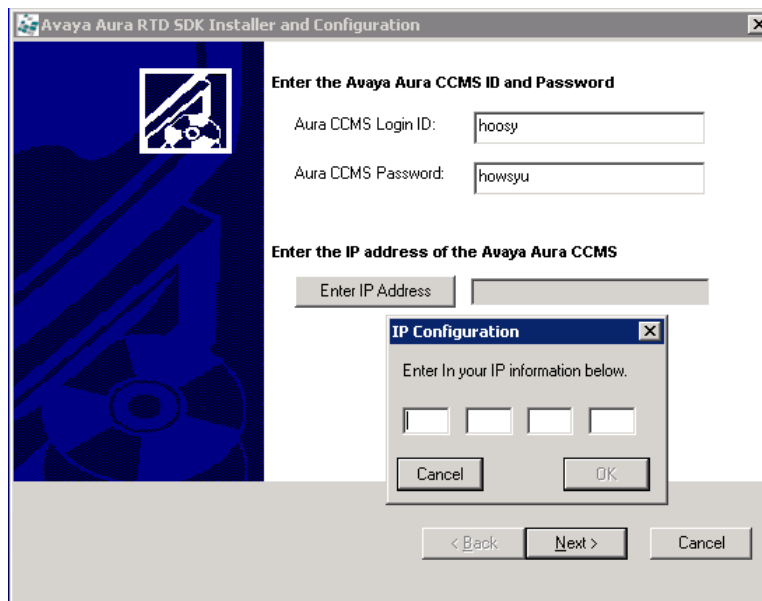


Figure 5

16. Select the desired timing and the tables from which to pull the data (Figure 6). For timing, you can select Interval-to-date, Moving Window, or both. Click *Next*.

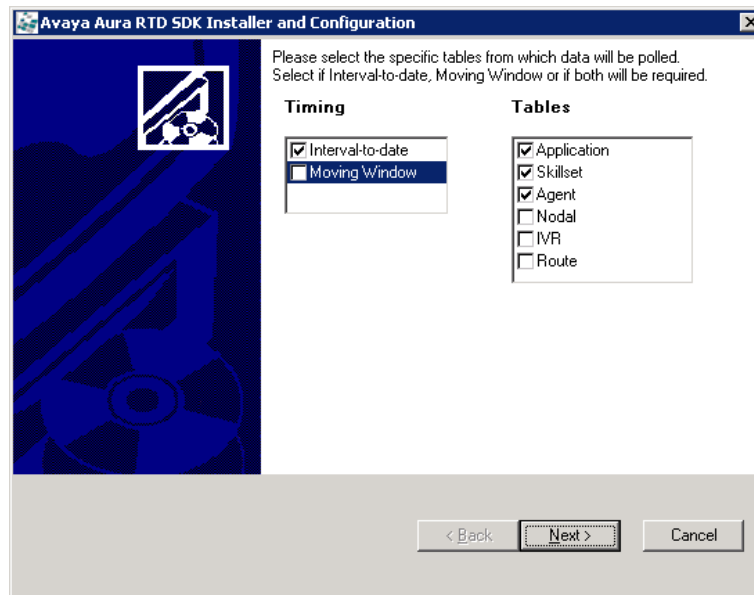


Figure 6

17. Click *Finish* to exit the installation wizard.

The installer will create two new files for LightLink:

- the External DSM's INI, `NEW_LL_SYMPOS_template.ini`
- the DSM's SDF, `NEW_Symposium_Fields.sdf`

5.1.1. External DSM INI

Refer to Figure 7 for a sample INI. The INI will automatically be configured with the following:

- Host Name of the Server to which RTD Toolkit is being installed
- Aura CCMS IP address
- Aura CCMS ID and PW for access
- The Query count & the individual queries based on Timing and Tables selected during install

The INI also includes a complete table, as a comment, listing all available tables as per Figure 1, above.

The default LightLink DSM communication port is **6000**. This port cannot be changed when running the installer, but can be manually changed afterwards.

```

NEW_11_SYMPOS_template.ini - Notepad
File Edit Format View Help
[LightLink]
LLCommAddress=type=TCP/IP, host=wallace-lab, port=6000
LLCommMode=3
Heartbeat=1
HeartbeatText=r/a

#
# -----
# Symposium connection configuration
# -----
# This section contains information used for configuring the communications with the
# Symposium software.
# SymposiumTimeout = This is the number of seconds to wait for a response from the symposium before
# considering it to be disconnected. This value can be any integer between
# 60 and 999999. The value can also be 0, which means that there will be no
# timeout on the symposium connection.
# SymposiumAddress = TCP/IP IP number of the machine which is running the wortel symposium server.
# symposiumLogin = Login account ID for logging into the wortel symposium server.
# SymposiumPassword = Password on the login account for the wortel symposium server.
# QueryCount = Number of Symposium queries that follow.

[sympos]
SymposiumTimeout=60
SymposiumAddress=2.1.1.1
SymposiumLogin=sympos_id
SymposiumPassword=sympos_pw
QueryCount=2

# -----
# Symposium Tables Inova has access to at this time:
# -----
# Interval to date statistics (starting from 100)
# Table Name Table #
# Application 100
# sk11set 101
# Agent 102
# nodal 103
# IVR 104
# route 105

# Hourly window statistics
# Table Name Table #
# Application 106
# sk11set 107
# Agent 108
# nodal 109
# IVR 110
# route 111

# -----
# QUERIES
# -----

[Query1]
Label=APPL
TableID=100
Columns=130-148,251
updateRate=5000
[Query2]
Label=SK11SET
TableID=101
Columns=130-169,250,252-258
updateRate=5000
    
```

Figure 7

5.1.2. LightLink DSM SDF

Refer to Figure 8 for a sample SDF. The SDF will be created with the following configuration:

- Total table count that is based on the Timing and Tables selected during install.
- Individual table entries for each Timing & Table selected during install
- All data fields associated with the specific Timing & Table entries.

The Keys provided in this SDF are placeholders only. The Key Count and specific Keys must be manually entered by the technician. Use LightLink Log Viewer to view the incoming raw data to see the key names to use.

```

NEW_Symposium_Fields.sdf - Notepad
File Edit Format View Help

[[General]
Description=NT Symposium
SourceDataType=recordstream
Reportcount=1

[Report1]
TableCount=2
EndofRecord=~0d
[Report1Table1]
Name=Application
FieldDelimiter=:
Header=APPL
KeyOffset=1
KeyCount=1
Key1=1,APPL_TEST
FieldCount=19
Field1=Total Calls Abandoned,uint32,0,3
Field2=Calls Abandoned After Thresh,uint32,0,4
Field3=Calls Abandoned Delay,time2,0,5
Field4=Total Calls Answered,uint32,0,6
Field5=Calls Answered After Thresh,uint32,0,7
Field6=Calls Answered Delay,time2,0,8
Field7=Calls waiting,uint32,0,9
Field8=Max Waiting Time,time2,0,10
Field9=waiting Time,time2,0,11
Field10=Calls Answered Skillset Delay,uint32,0,12
Field11=Calls Given Terminate,uint32,0,13
Field12=Calls Offered,uint32,0,14
Field13=Network out Calls,uint32,0,15
Field14=Network out Abandoned,uint32,0,16
Field15=Network out Abandoned Delay,time2,0,17
Field16=Network out Answered,uint32,0,18
Field17=Network out Answered Delay,time2,0,19
Field18=Network out Calls waiting,uint32,0,20
Field19=Delay BEF Interflow,uint32,0,21
[Report1Table2]
Name=Skillset
FieldDelimiter=:
Header=SKLSET
KeyOffset=1
KeyCount=1
Key1=10025,SK_TEST
FieldCount=27
Field1=Calls waiting,uint16,0,3
Field2=Max wait Time,time2,0,4
Field3=Agents Available,uint16,0,5
Field4=Agents in Service,uint16,0,6
Field5=Longest wait Time-Last Call,time2,0,7
Field6=Agents Not Ready,uint16,0,8
Field7=Agent on Skillset Calls,uint16,0,9
Field8=Total wait Time,time2,0,10
Field9=Expected wait Time,time2,0,11
Field10=Calls Answered After Threshold,uint16,0,12
Field11=Longest wait Time Since Login,time2,0,13
Field12=Agent on ON call,uint16,0,14
Field13=Skillset State,string,0,15
Field14=Agent unavailable,uint16,0,16
Field15=Network Call wait,uint16,0,17
Field16=Network Call Answered,uint16,0,18
Field17=Queued Call Answered,uint16,0,19
Field18=Total Answered Delay,int32,0,20
Field19=Total Call Answered,uint16,0,21
Field20=Agent on Network ICCM Call,uint16,0,22
Field21=Agent on Other ICCM call,uint16,0,23
Field22=Agent on ACD Call,uint16,0,24
Field23=Agent on NACD Call,uint16,0,25
Field24=Total Calls Offered,uint16,0,26
Field25=Total Calls Abandoned,uint16,0,27
Field26=Calls Abandoned Delay,time2,0,28
Field27=Calls Abandoned After Threshold,uint16,0,29

```

Figure 8

5.2. Manual Installation

Below are the steps for a manual installation. *Be aware that an Inova Installer, Avaya Aura RTD Toolkit Install & Configuration.exe, exists to handle RTD SDK toolkit installation and registry edits.*

5.2.1. Install Toolkit

1. Download the toolkit from the Inova Support site and install it, using ANSI only.
2. Once the toolkit has been installed add the path to the `NBNmSrvC.exe` file to the System Path variable in the Environment Variables. For more detailed steps, refer to step **Error! Reference source not found.** in section 5.1.
3. Configure the RTDSDK registry by opening REGEDIT to `HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Nortel\Setup\NINameserver`.
4. Customize the following:
 - **NSAddr:** IP Address of the machine hosting this Input Manager/DSM. This is the server where the RTD toolkit is installed.
 - **NSPath:** Path to the “`nbnmsrvC.exe`”; this should be the path to which the toolkit installed, but include the `nbnmsrvC.exe` executable at the end of the path.
 - **SiteName:** Host Name of the machine hosting this Input Manager DSM.
5. Check the same registry for related set of keys, `ErrorCode`, and `ErrorMessage`. Verify that the resulting values of `0` (zero) and `OKAY!!` Are present, indicating a successful setup.
6. To retest: Delete the item for `OKAY!!` and change the Error Code item to `1` (one). Run `nicomssetup` from the `\bin` folder and then check the registry again.

5.2.2. Configure an External DSM

7. Create and configure an External DSM within LightLink Administrator to connect to the Avaya Aura RTD. Use the `LL_SYMPOS_template.INI` file to begin the configuration. This INI has three sections; `LL_SYMPOS`, `LightLink`, and `SYMPOS`.

The `LightLink` section will be used to point back and connect to the Input Manager DSM on a configured port.

8. Configure `LL_SYMPOS`, which allows you to configure the data dumping. When saving this INI file, make sure to use a unique name (not the template name). There should be no spaces in the name.

9. Configure the SYMPOS section, which contains the Symposium Address, User ID, and Password. This is also where the “Query” being requested of Symposium is defined.
10. Configure the communications with the Aura CCMS software. Refer to Figure 9 for a sample SYMPOS configuration block (the Aura CCMS was formerly the Symposium; Avaya purchased that company, thus the apparent naming collisions). Customize the following:
 - SymposiumTimeout - Number of seconds to wait for a response from the Symposium before considering it to be disconnected. This value can be any integer between 60 and 999999. The value can also be 0 to indicate that there will be no timeout on the Symposium connection.
 - SymposiumAddress - TCP/IP IP number of the machine which is running the Aura CCMS server.
 - SymposiumLogin - Login account ID for logging into the Aura CCMS service.
 - SymposiumPassword - Password on the login account for the Aura CCMS service.
 - QueryCount - Number of Symposium queries that follow.

Figure 9

```
[SYMPOS]
SymposiumTimeout=60
SymposiumAddress=1.1.1.1
SymposiumLogin=sysadmin
SymposiumPassword=Nortel
QueryCount=1

[Query1]
Label=APPL
TableID=100
Columns=130-148,251
UpdateRate=5000
```

11. Once the INI has been configured, save it with a unique name. The External DSM should appear in Administrator’s tree with disconnected status.

5.3. Create and Customize Remaining Components

1. Create the Avaya Aura Data Source Manager (DSM) using LightLink Administrator.

2. On the General tab on the Properties window, provide a unique name for the Avaya Aura Contact Center / RTD data (i.e. Regina AACC).
3. Click on the Connection tab in the Properties window. The Connection tab will point to the Host Name/IP and port defined in the LightLink section of the INI. This *should not* point to the Host Name/IP of the Aura CCMS.
4. Select the Settings tab; this is where the SDF is defined. There is no need to modify the DSS from the default. Refer to the Best Practices section for more assistance with the SDF.

5.4. Verify Launch

1. Once the External DSM and DSM have been created and properly configured, complete a clean stop and start.
2. Once the system comes back online the Avaya Aura EDSM (i_ext_symposium.exe) and the RTD toolkit service "nbnmsrvc.exe" should be running and owned by the System account. The Task Manager processes tab should list these executables.

Note: In recent installations, these two processes do not launch automatically and a "jump-start" maybe needed. To do so:

- At a command prompt, open the Server directory and execute the "i_ext_symposium.exe" with the only parameter being the INI file that you have configured. Refer to Figure 10 for an example using the default INI.

Figure 10

```
C:\Program Files (x86)\Inova Solutions\Server>i_ext_symposium.exe/LL_AURA_template.ini
```

To verify that everything launches properly, check the Task Manager Processes tab for the "i_ext_symposium.exe" and the "nbnmsrvc.exe" processes. (See Figure 11.) If you have manually launched via command line these should be running under your User Name or they will be running under the SYSTEM account if they launched on their own successfully.

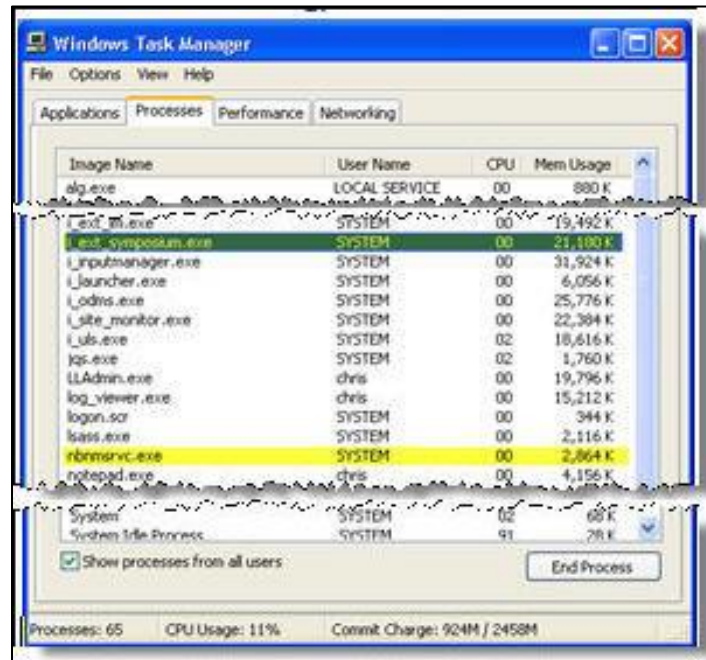


Figure 11

The Log Viewer will show the DSM and the INI logs (Figure 12).

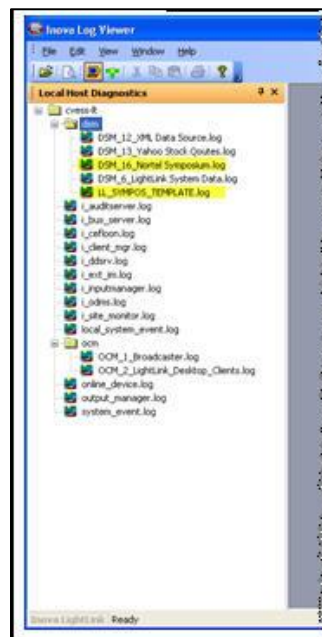


Figure 12

If launched manually, make sure to do a Clean Stop and Start and verify that it launches automatically.

6. Best Practices

By now you may have noticed that this interface is a record stream. Unlike Avaya RT Socket or other similar record streams, the Query of the INI must actually define the record stream to be returned to use.

The top of this document references the tables and the data fields available. Each table and data field has its own unique table and column number. You should not bring data in to LightLink if it is not going to be used; you should not leave the KeyCount=0. If the customer only needs a few data fields, then define those field numbers in the INI and SDF appropriately. The first column, queue name (ID), must always be sent since this is the key. Refer to Figure 13 for an example.

```
[Query1]
Label=APPL
TableID=100
Columns=130-133
UpdateRate=5000

SDF would look like this:

[Report1Table1]
Name=Application
FieldDelimiter=:
Header=APPL
KeyOffset=1
KeyCount=1
Key1=4,NACD_DN_Application
FieldCount=3
Field1=Total Calls Abandoned,uint32,0,3
Field2=Calls Abandoned After Thresh,uint32,0,4
Field3=Calls Abandoned Delay,time2,0,5
```

Figure 13

6.1. Customize the SDF

The SDF should always have the Keys defined. Never leave the SDF with KeyCount=0 as there is potential for too much data to be brought into LightLink.

Refer to Figure for a sample SDF that pulls from the two most used tables, Application and SkillSet. There are also tables for Agent, and each of these tables is available as Moving Window, instead of Interval-to-Date. The customer is most likely not going to be able to give you the Application and Skillset numbers, just the names. When configuring the DSM, setting the KeyCount=0 and letting all the data come through may be the only option for determining the numbers to then use as keys.

Note that:

- The Header must match the table label name defined in the INI query (i.e., for “Label=SKLST” the SDF must be defined as “Header=SKLST”). If the Label and Header do not match the DSM will not connect to the EDSM.
- Naming convention. See Figure 32. If using both “interval-to-date” and “moving window” tables it is important the queue names are unique. It is recommended to place a “MW_” or even just “MW” in the front (not the back where the name could be truncated) of each queue to represent Moving Window. Simply making Table names unique will not be sufficient.


```

[General]
Description=Nortel Symposium
SourceDataType=recordstream
ReportCount=1

[Report1]
TableCount=3
EndOfRecord=-0d

[Report1Table1]
Name=Skillset
FieldDelimiter=:
Header=SKLSET
KeyOffset=1
KeyCount=2
Key1=10000,Hotel Services
Key2=10001,Restaurant Services
FieldCount=11
Field1=Calls Waiting, uint16,0,3
Field2=Max Wait Time, time2,0,4
Field3=Agents Available, uint16,0,5
Field4=Agents in Service, uint16,0,6
Field5=Longest Wait Time - Last
Call, time2,0,7
Field6=Agents Not Ready, uint16,0,8
Field7=Agent on Skillset Calls, uint16,0,9
Field8=Total Wait Time, time2,0,10
Field9=Expected Wait Time, time2,0,11
Field10=Calls Answered After
Threshold, uint16,0,12
Field11=Longest Wait Time -
Login, time2,0,13

[Report1Table2]
Name=Application
FieldDelimiter=:
Header=APPL
KeyOffset=1
KeyCount=7
Key1=4,NACD_DN_Application
Key2=10004,TestScript
Key3=1,Master_Script
Key4=2,Network_Master
Key5=3,ACD_DN_Application
Key6=10005,GaryMain
Key7=10001,ShawnMain

[Report1Table3]
Name=MW_Application
FieldDelimiter=:
Header=MW_APPL
KeyOffset=1
KeyCount=7
Key1=4,MW_NACD_DN_Application
Key2=10004,MW_TestScript
Key3=1,MW_Master_Script
Key4=2,MW_Network_Master
Key5=3,MW_ACD_DN_Application
Key6=10005,MW_GaryMain
Key7=10001,MW_ShawnMain
FieldCount=12
Field1=Total Calls Abandoned, uint32,0,3
Field2=Calls Abandoned After
Thresh, uint32,0,4
Field3=Calls Abandoned Delay, time2,0,5
Field4=Total Calls Answered, uint32,0,6
Field5=Calls Answered After
Thresh, uint32,0,7
Field6=Calls Answered Delay, time2,0,8
Field7=Calls Waiting, uint32,0,9
Field8=Max Waiting Time, time2,0,10
Field9=Waiting Time, time2,0,11
Field10=Calls Answered Skillset
Delay, time2,0,12
Field11=Calls Given Terminate, uint32,0,13
Field12=Calls Offered, uint32,0,14

```

Figure 32

7. Troubleshooting

7.1. Port 10000 Not Available

If Log files indicate API is hanging on Login and not returning errors then port 10000 may not be available. This port must be open for the “nbnmsrv.exe” to connect – this name service is how the RTD application logs into the Aura CCMS Server. All of Aura CCMS is expecting the name service to be listening on this port. “Nbnmsrv.exe” is used by RTD, the CCMS/SCCS client, Web Client, and Aura/Symposium Agent.

To check port availability: At a command prompt, with LightLink Services stopped

(Clean Stop) run “**netstat -a**” and verify port 10000 is not in use by another application.

Additionally, RTD expects ports 10001 to 10399 to be free for the rest of the run-time binaries. If an application is using these ports you may have issues.

7.2. DP_Failure

Refer to the excerpt below from James Larsen (Nortel Developer) for detailed information:

When you get a return code of 60059, Data Propagator error, as the return code for an initial query request, or as the return code for a callback function, this return code is telling the application that the SCCS server currently cannot complete the request for sending the data. This can be caused by a couple of reasons.

The first is a problem on the SCCS server, where the DP_SERVICE has crashed or shutdown. The major cause of the issue is where an administrator has turned off the ability of the SCCS server to send the data type requested. On the SCCS client, there is a section called Real-Time Statistics Configuration.

Each of the 6 table groups are listed, and there is a checkbox for the Agent, Application, IVR, and Route tables. If the checkbox is unchecked, then no data for this table group will be sent out. Skillset and Nodal cannot be turned off.

Also there is a combo box for each table group, and by default is set to interval-to-date and moving-window. There is no valid reason to ever change this but administrators will do it anyway.

If the table is set to moving-window only and you issue an interval query, then the 60059 return code results, as the DP is configured to not be able to send the requested data. The rest of this dialog for configuration is for setting the length of time for the interval-to-date setting. The default is 15 minutes and can be increased in 15 minute increments up to 24 hours.

This will be the cause of the issue at the customer site. The SCCS desktop account does not have to be an administrator account for doing RTD, but the account only affects logging into the SCCS server, and the 60059 return code occurs when querying data.

7.3. Error Codes

Refer to Table 4 for a list of errors that can be presented in the LightLink logs. Note that the “NIrtd e...” has been stripped in our logs.

Error	Error Code	Explanation
NIrtd_eOK	0	
NIrtd_eSERVER	60001	/* Invalid server id passed. */
NIrtd_eROW_INIT	60002	/* Allocation and init of row failed. */
NIrtd_eTABLE	60003	/* Invalid table id (query) passed. */
NIrtd_eCOLUMN	60004	/* Invalid column selection (query) passed. */
NIrtd_eNOT_AVAIL	60005	/* The query asked for a statistic that is not currently being collected by the server. */
NIrtd_eUSERID	60006	/* Invalid user id passed. */
NIrtd_ePASSWORD	60007	/* Invalid password passed. */
NIrtd_eUSERS	60008	/* Too many users logged in to the server. */
NIrtd_eLOGIN_FAIL	60009	/* General login failure. */
NIrtd_eLOGOUT_FAIL	60010	/* General logout failure. */
NIrtd_eUPDATE	60011	/* Invalid update rate passed. */
NIrtd_eQUERY_INITPARM	60012	/* Query parm found to not be NULL on initialization. */
NIrtd_eQUERY_NOINIT	60013	/* Query found to be NULL. Should be initialized in call to NIrtd_allocateQuery. */
NIrtd_eQUERY_INIT	60014	/* Failed to initialize Query. */
NIrtd_eCONJ_INIT	60015	/* Failed to initialize Conjunction. */
NIrtd_eCONJ_NOINIT	60016	/* Conjunction found to be NULL. Should be initialized in call to NIrtd_allocateConjunction. */
NIrtd_eAUTH_INIT	60017	/* Failed to initialize authorization structure.*/
NIrtd_eSERV_INIT	60018	/* Failed to initialize the server structure. */
NIrtd_eINVALID_AUTH	60019	/* Failed to validate pre-authorization. Ensure NIrtd_Login has been called. */
NIrtd_eREG_INIT	60020	/* Failed to allocate registration. */
NIrtd_eROW_INVALID	60021	/* The row indicated does not exist. */
NIrtd_eCOL_INVALID	60022	/* The column indicated does not exist. */
NIrtd_eDATA_INVALID	60023	/* The data returned from the remote server was invalid. */
NIrtd_eMUST_DEREG_FIRST	60024	/* Attempt to logout before deregistration failed. */
NIrtd_eINVALID_TABLE	60025	/* Attempt to free an un-allocated group table. */
NIrtd_eLISTENER_INIT	60026	/* Failed to initialize a listener for data propagation. */

Error	Error Code	Explanation
NIrtd_eTABLE_GROUP_INIT	60027	/* Failed to allocate and initialize the group table being returned. */
NIrtd_eKEY	60028	/* Passed value is not a key or is not a key for this table. */
NIrtd_eKEY_MISMATCH	60029	/* Keys in this conjunction are from different tables. */
NIrtd_eNOT_FOUND	60030	/* The requested name was not found. */
NIrtd_eLOGIN	60031	/* PC user login notification */
NIrtd_eLOGIN_ERR	60032	/* PC user login error */
NIrtd_eLOGIN_NO	60033	/* no PC user login yet */
NIrtd_eLOGIN_ALREADY	60034	/* PC user login already */
NIrtd_eCOLUMN_INIT	60035	/* Need to initialize the name/column cache. */
NIrtd_eNAME_INIT	60036	/* Failed to allocate name. */
NIrtd_eSSLIST_GET	60037	/* Failed to get skillset name cache. */
NIrtd_eAPPLIST_GET	60038	/* Failed to get application name cache. */
NIrtd_eAGENTLIST_GET	60039	/* Failed to get agent name cache. */
NIrtd_eCACHE_REMOVAL	60040	/* Failed to remove a name a cache. */
NIrtd_eID_NAME_MISMATCH	60041	/* Value content mismatch as compared to the indicated column. */
NIrtd_eDIDNOTBUY	60042	/* Failed to login to the server due to the real time access feature not having been purchased. */
NIrtd_eREMOTE_SYSREC_FAIL	60043	/* Failed to login due to a failure to read the system record at the remote site. */
NIrtd_eINVALID_REG	60044	/* Invalid registration identifier passed. */
NIrtd_eSET_ONLY_ON_INIT	60045	/* The setRecovery routine can only be called prior to calls for real-time data propagation. */
NIrtd_eSTART_RECOVERY	60046	/* A de-registration / re-registration attempt is being made. */
NIrtd_eOK_RECOVERY	60047	/* The de-registration / re-registration attempt was successful */
NIrtd_eBAD_RECOVERY	60048	/* The de-registration / re-registration attempt was not successful and a retry has been scheduled. */
NIrtd_eVALUE_INIT	60049	/* The passed value is invalid. */

Error	Error Code	Explanation
Nlrttd_eCOL_NOT_FOUND	60050	/* Column not loaded into name cache. */
Nlrttd_eLIMIT_REACHED	60051	/* A passed parameter exceeds the defined limit. */
Nlrttd_eALLOC_FAILED	60052	/* A required memory allocation failed. */
Nlrttd_eNULL_CALLBACK	60053	/* A null call back function was passed. */
Nlrttd_eWORKER_INIT	60054	/* Failed to initialize a worker for registration recovery. */
Nlrttd_eCOMM	60055	/* A communications failure occurred. */
Nlrttd_eRDC_FAILURE	60056	/* Failure in DP communication with RDC or a failure of the defined query when being processed by RDC. See server logs. */
Nlrttd_eIVRLIST_GET	60057	/* Failed to get IVR name cache.*/
Nlrttd_eROUTELIST_GET	60058	/* Failed to get Route name cache. */
Nlrttd_eDP_FAILURE	60059	/* Failed in DP */
Nlrttd_eLOGIN_NO_EULA	60060	/* No End-User License Agreement (that is, no user selected the “yes” box after the agreement is displayed) */
Nlrttd_eLOGIN_NO_SERVER_VERSION	60061	/* Failure to obtain the server version */
Nlrttd_eLOGIN_FAILED_SERVER_VERSION	60062	/* Wrong version number */

Table 4: Error Codes