Inova Solutions
A Geomant Company

LightLink Data Source Installation Guide

Cisco UCC Enterprise

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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 alerts, such as a messages, texts, emails, color changes, or audio notifications, 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.

1.1. Executive Summary

Cisco Unified Contact Center Enterprise, as well as the previous version known as Cisco IPCC Enterprise, is an interface that enables LightLink to retrieve an extensive array of data from the UCC Enterprise for real-time processing and display.

The Inova LightLink and Cisco UCC Enterprise interface consists of an Open Database Connectivity (ODBC) connection to the Cisco UCC Enterprise SQL Server database. With the Cisco UCC Enterprise Data Source, UCC Enterprise database tables are treated as sources of LightLink data fields. Any field in the UCC Enterprise database tables can become a data field within LightLink.

LightLink is the powerful middleware that provides a real-time infrastructure for capturing and communicating information throughout the enterprise. Interfaces are available for dozens of Automated Call Distributors (ACDs), telephony systems, databases, and management applications.

Open Database Connectivity (ODBC) is a standard framework that allows any application to access information from any database, providing that they are both ODBC compliant, and that a suitable ODBC driver has been installed.

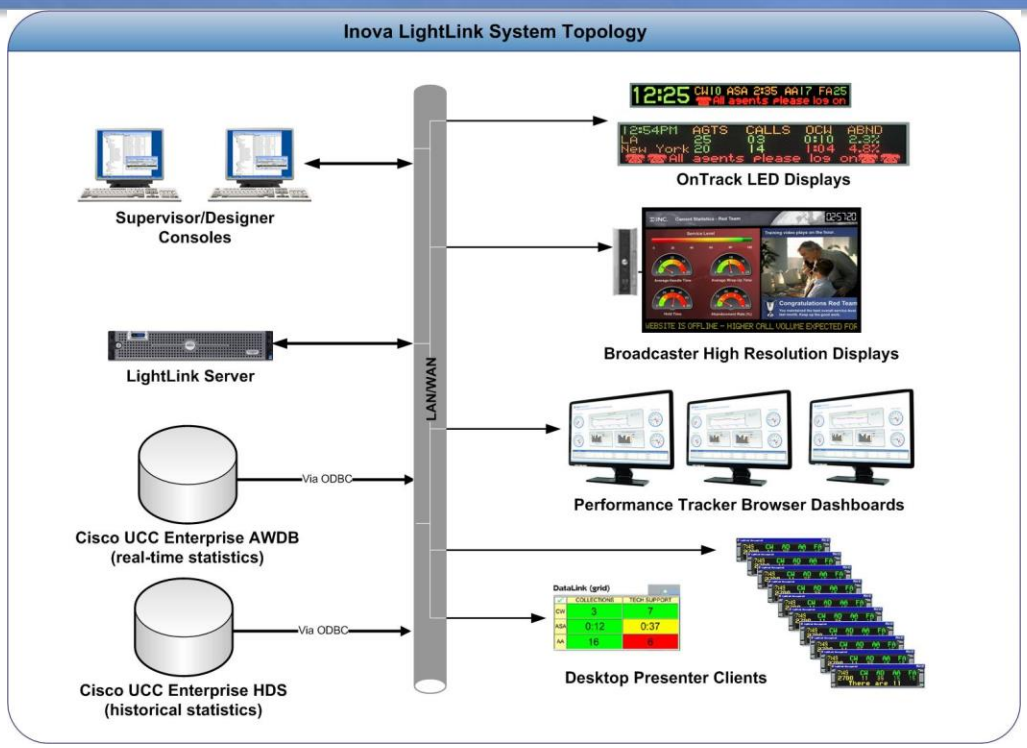

Figure 1

2. Data Fields

There are numerous tables available; refer to Appendix A for additional information about data fields.

3. Prerequisites

Inova requires the customer to have a working knowledge of the Cisco/Cisco UCC Enterprise schema, which can vary from site to site, as well as a working knowledge of SQL statements.

Prior to installation, the customer must:

- Provide specific database access credentials and network information.
- Set up the ODBC System DSN on the LightLink Server.
- Configure ODBC functionality on the Database Server, if needed (Oracle, for example).
- Write the specific SQL query.
- Allow access to the Database administrator for coordination and optimization.

- Provide appropriate SQL Server driver to read the UCC Enterprise source tables. Many of the Microsoft® ODBC drivers, including SQL Server, are generally available with a typical Windows 2000 or Windows Server 2003 installation. However, if the driver is not present, the customer must supply the necessary ODBC driver, which can usually be found on the Microsoft support site.
- Provide IT Assistance creating the Data Source Name (DSN) on the LightLink Server computer that connects to the Cisco UCC Enterprise database.
- Provide IT Assistance dealing with any intervening firewalls or network connectivity problems.
- Provide Username and Password for the Cisco UCC Database(s).

The customer must purchase Inova LightLink's wallboard software separately and configure the settings to access the appropriate UCC Enterprise source tables. LightLink wallboard software and hardware are supported by Inova Solutions, not by Cisco.

The customer must install the wallboard software on a separate machine or desktop, not on the CRA server. During installation of the wallboard software, the customer must configure the wallboard software to access the CRA database. To do this, the customer must assign a DSN, User ID, and password.

The LightLink ODBC (Open Database Connectivity) data source requires appropriate Level 2 ODBC drivers to read the user's source tables. Many of the Microsoft ODBC drivers are installed as part of the LightLink server installation, including drivers for Microsoft Access, dBase, Paradox, FoxPro, SQLServer, and Oracle. Drivers for other databases usually are available for download from the database vender or from third-party vendors.

4. Product Specifications

4.1. Capacity and Limitations

The configuration of UCC Enterprise systems varies widely. The LightLink system will be performing a data base query which will return a known number of columns, but the number of records is determined by the complexity of the UCC Enterprise system. The total number of data fields returned is the number of rows multiplied by the number of columns. The LightLink UCC Enterprise data source is limited to returning 300 records per data table query. A system returning more than 300 records may require professional services as described in the next section.

As is usual with database applications, query size, database server load and network bandwidth can all limit performance. With modest planning, 10 second latency on queries of up to 5000 data elements is achievable on most systems.

Also, it is possible to overload the LightLink Communications Bus, which is shared by all data sources. This limit depends upon many factors, but reduced function may occur at values greater than 800 updated fields per second. The practical limits vary from site to site.

- *Query Size*: 2000 data fields is the standard limit for each query. In general, limiting the SQL query to return only the fields required for calculation or display will pay dividends for system responsiveness and stability. Higher numbers are possible in multiple server architectures.
- *Refresh time*: Refresh time can be set to as little as 1 second. However, in practice, setting the refresh rate to 5-30 seconds is strongly recommended. This depends on the size of the data set returned, as well as the database responsiveness. For instance, if a query is repeated before the previous iteration is complete; the data source may not produce updated information.

4.2. Compatibility

ODBC database implementations run on many operating systems, including Microsoft Windows, Unix, Linux, OS/2, OS/400, IBM i5/OS, and Mac OS X.

Hundreds of ODBC drivers exist, including drivers for Oracle, DB2, Microsoft SQL Server, Sybase, Pervasive SQL, IBM Lotus Domino, MySQL, PostgreSQL, and desktop database products such as FileMaker, and Microsoft Access. Drivers for Microsoft SQL server, Access, Dbase, and a basic Oracle driver are provided as a standard component on all Microsoft Server variants.

Cisco UCC Enterprise Versions 5.0 and higher are compatible with all supported versions of LightLink.

4.3. Licensing

A single Inova ODBC data source license provides for three queries to a single database system. Any fields that can be specified via SQL query or stored procedure execution are accessible.

Many SQL databases have built-in ODBC functionality and the drivers are provided in standard Windows installations. For instance, Microsoft provides drivers for Access, SQL Server, as well as a basic Oracle driver. However, some database vendors make this an optional, licensed component on the database server. Oracle, Sybase and Informix are some examples. If the source database is not a Microsoft variant, please check with your integrator or vendor to ensure

that you have this component, and that you are able to provide ODBC drivers for the LightLink server.

4.4. UCC Enterprise Professional Services

The standard UCC Enterprise data source meets the needs of most customers. In circumstances where customers have additional data or reporting needs, Inova Solutions offers professional services on a time and materials basis to provide the necessary customer service. Typically those services include one or more of the following:

- Adding additional fields beyond those installed by the standard data source.
- Mathematically deriving a new field from the data in the standard fields.
- Reformatting or converting a field to a different type or to different units than those presented in the UCC Enterprise database.
- Configuring a UCC Enterprise data source that returns more than 300 records from any particular data table.

5. Installation and Basic Configuration

5.1. Create Microsoft ODBC Data Source Connection

The System DSN is a standard component on all Windows based systems, and is administered via the ODBC Data Source Administrator control panel. The DSN typically contains network address and hostname for the database server, as well as authentication and specific database details.

1. Open ODBC Administrator and click on the System DSN tab at the top. Click the Add button. (See Figure 2.)

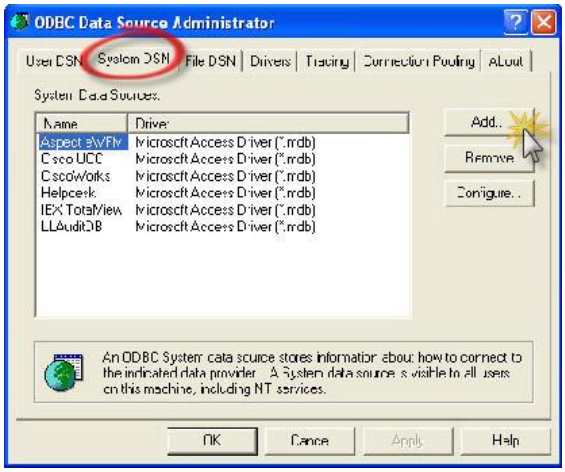

Figure 2

2. On the Create New data Source window (Figure 3), select the SQL Server and then click Finish.

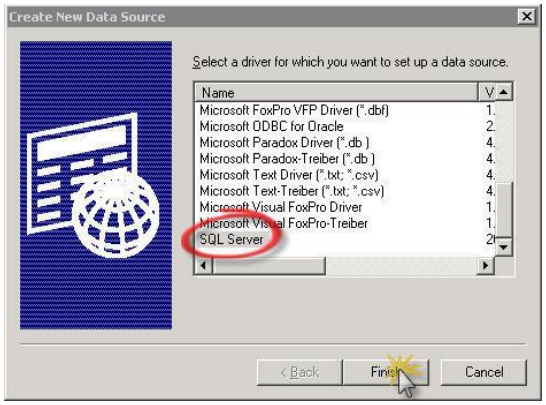

Figure 3

3. The Create a New Data Source to SQL Server window opens (Figure 4). Enter the name and description. For the server, choose the UCCX database machine name to which you wish to connect. Click Next.

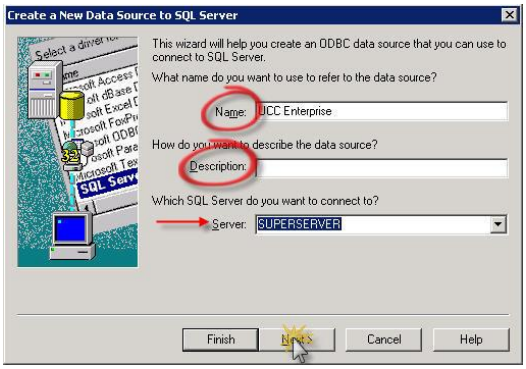

Figure 4

4. On the next window (Figure 5), select the button appropriate for your type of authentication. Complete the authentication requirements and then click Next.

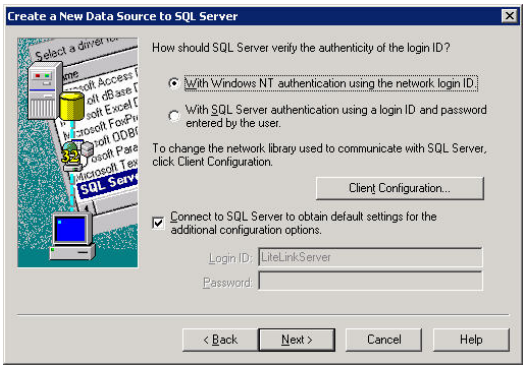

Figure 5

a. If you are using SQL Server authentication, enter the login ID and password.

b. If you are using Windows NT authentication, go to Windows Services > Inova Application Launcher and navigate to the proper account. Enter the account and log in.

5. On the next window (Figure 6), accept the default specifications. Click Next.

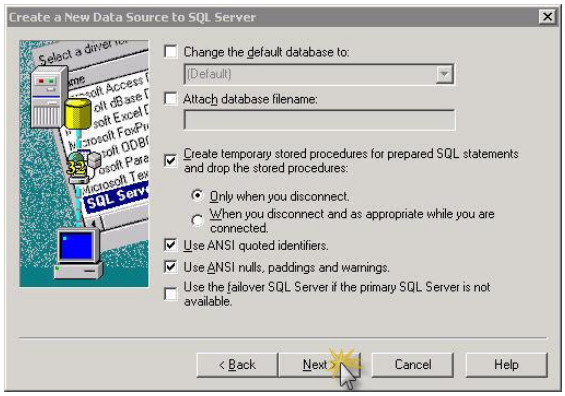

Figure 6

6. Accept the default parameters on the next window (Figure 7) and then click Finish.

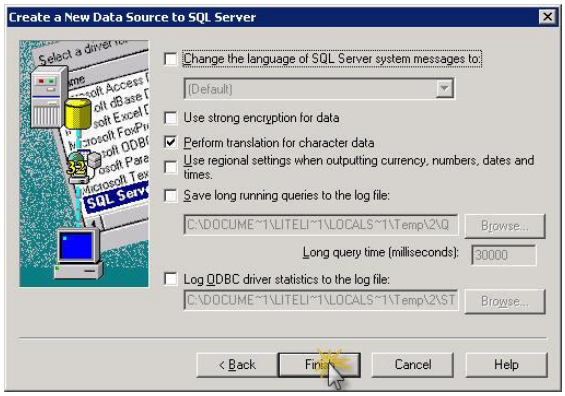

Figure 7

7. On the ODBC Microsoft SQL Server Setup Window (Figure 8), click Test Data Source to make sure the account is correct.

Figure 8

8. You should see a screen notifying you that the test was successful (Figure 9). If the test did not work, check the Windows or SQL account that you created.

Figure 9

5.2. Add Connection to Administrator

1. Open LightLink Administrator by either:
    - Using the Taskbar Buttons most commonly found in the lower right hand corner; simply right-click on the , and then select Administrator.

- Navigating to Start > Programs > Inova LightLink > Administrator.

2. In order to make configuration changes to your LightLink system, you must request and receive Configuration Permission to keep others with administrative permission from making configuration changes at the same time. When the lock at the bottom of the page appears unlocked, you will notice that configuration changes will appear inactive or "grayed out."

   To do this, click on the lock icon located to the far right on the toolbar at the top of the screen. Once Configuration Permission has been granted, the lock at the bottom on the window will appear to be locked. (See Figure 10.)

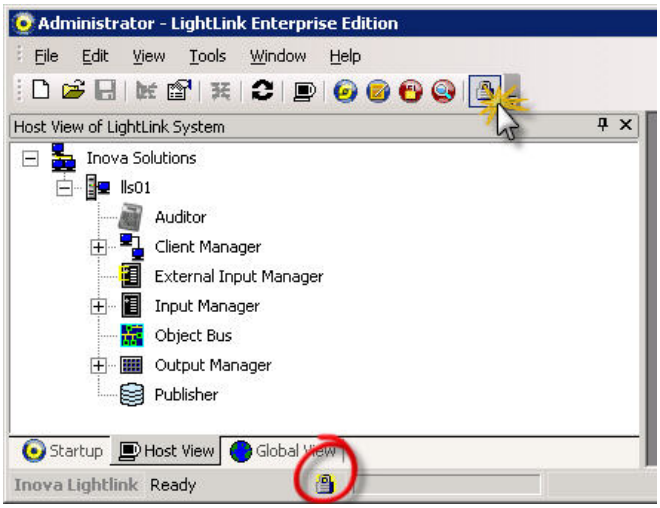

Figure 10

3. Right click on Input Manager and select *New Data Source*.

4. On the New Data Source window (Figure 11), select ODBC Database and then click OK.

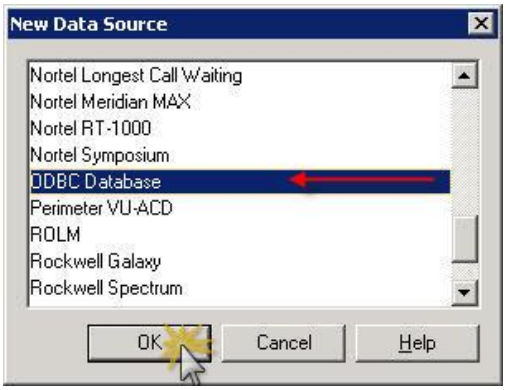

Figure 11

5. The Database Properties window will open. Click the General tab and enter the desired name (e.g., ODBC Enterprise).

6. Select the Database tab on the Database Properties window and click Browse (number 1 in Figure 12).

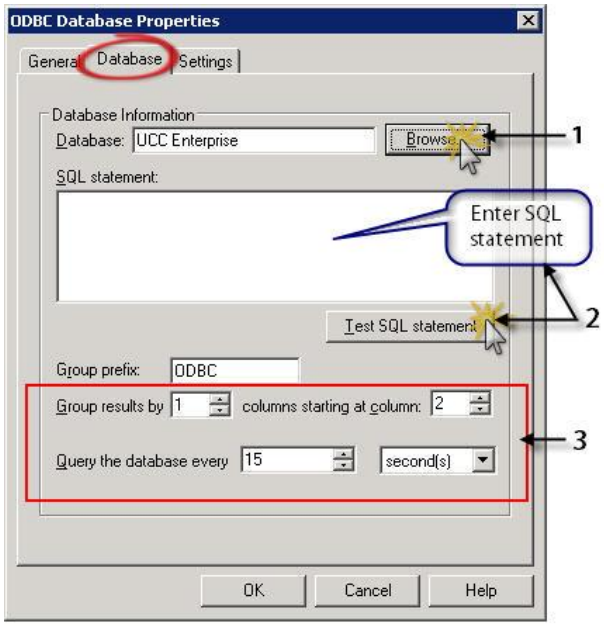

Figure 12

7. On the Select Data Source window (Figure 13), select the Machine Data Source tab and then select the ODBC data source that you previously created. Click OK.

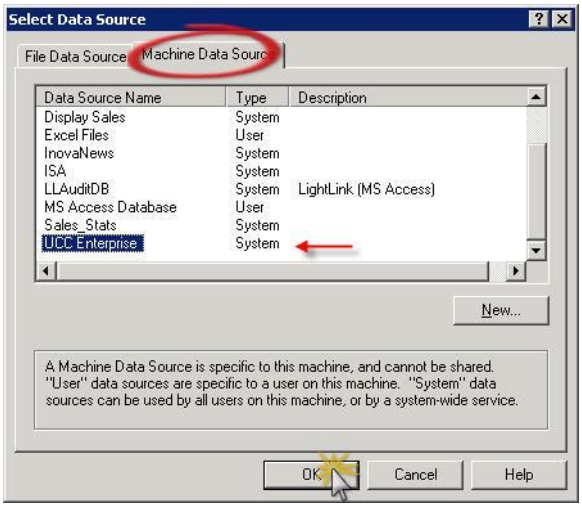

Figure 13

8. If you previously selected SQL Server authentication, you will be prompted for your username and password. Enter your login ID and password and then click OK.

9. You should now return to the Database Properties window. Enter the SQL statement and then click Test SQL statement (number 2 in Figure 12).

   Refer to page 21 for sample SQL statements. (For internal use only.)

   You should see return values in the SQL Query Results window (Figure 14).

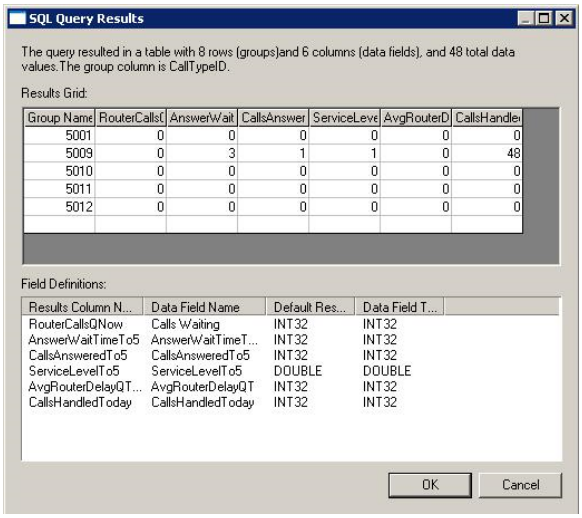

Figure 14

10. If desired, you can change the data field type by click on the data field name. Enter the desired information in the Field Configuration window (Figure 15).

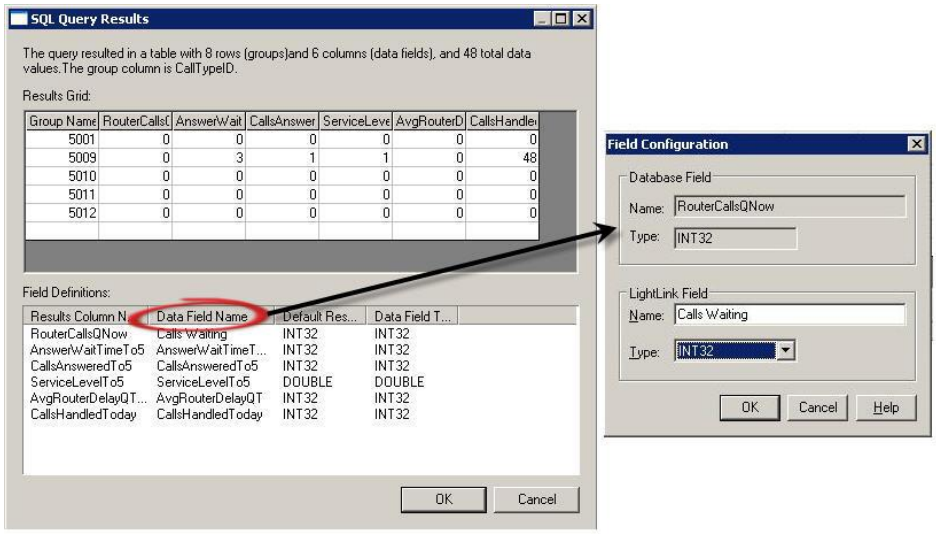

Figure 15

11. You should now return to the Database Properties window. Set the desired specifications for grouping and query times (number 3 in Figure 12).

    The default query time is 15 seconds, but you may need to increase this time, depending on the number of responses.

12. Click OK on the Database Properties window to complete adding the data source.

Appendix A: Data Fields

This appendix lists the fields that the Inova Solutions UCC Enterprise data source will pull into the LightLink System as part of this installation.

Skill_Group Table Fields

This table serves as a cross reference between the SkillTargetID and the name that the enterprise has given the Skill or Group. Note that records in the following tables are referred to by the SkillTargetID key, and those records do not contain the Enterprise Name.

Field Name	Description	Data Type	Keys / Null Option
SkillTargetID	An identifier that is unique among all skill targets in the enterprise.	DBINT	PK, FK, NOTNULL
Enterprise Name	An enterprise name for the skill group. This name must be unique among all skill groups in the enterprise.	VNAME32	AK-1 NOT NULL

Table 1

Call_Type Table Fields

This table serves as a cross reference between the CallTypeID and the name that the enterprise has given this type of call. Note that records in the following tables are referred to by the CallTypeID, and those records do not contain the Enterprise Name.

Field Name	Description	Data Type	Keys / Null Option
CallTypeID	A unique identifier for this call type.	DBINT	PK NOT NULL
Enterprise Name	An enterprise name for this call type. This name must be unique among all call types in the enterprise.	VNAME32	AK-1 NOT NULL

Table 2

Call_Type_Real_Time Table Fields

Field Name	Description	Data Type	Keys / Null Option
CallTypeID	A unique identifier for this call type.	DBINT	PK NOT NULL
DateTime	The Central Controller date and time at the start of the interval when the row was generated.	DBDATETIME	NOT NULL
ICRDefaultRoutedToHalf	Number of calls routed to the default label since midnight.	DBINT	NULL
NetworkDefaultRoutedToHalf	Number of calls of this type for which the IXC used default routing during the current half-hour interval.	DBINT	NULL
RouterCallsAbandQTo5	Number of calls of this type abandoned in the Router queue during the rolling five-minute interval. [1]	DBINT	NULL
RouterCallsQNow	Number of calls of this type currently in the Call Router queue. This metric does not show calls in queue at the local ACD. [1]	DBINT	NULL
RouterLongestCallQ	The time that the longest currently queued call for this call type entered the Call Router queue. [1, 2]	DBDATETIME	NULL
CallsHandledTo5	The total number of calls of this call type handled during the rolling five-minute interval.	DBINT	NULL
CallsOfferedTo5	The number of calls of this call type offered during the rolling five-minute interval.	DBINT	NULL
ServiceLevelAbandTo5	The number of calls of this call type abandoned within the service level during the rolling five-minute interval. [3]	DBINT	NULL
ServiceLevelTo5	The service level for this call type during the rolling five-minute interval. This is derived from ServiceLevelTo5ServiceLevelCallsTo5 and ServiceLevelCallsHandledTo5. [3]	DBFLT4	NULL
CallsHandledToday	The total number of calls of this call type handled since midnight.	DBINT	NULL
CallsOfferedToday	The total number of calls of this call type offered to this call type since midnight.	DBINT	NULL
ServiceLevelToday	The service level for this call type since midnight. This is derived from ServiceLevelCallsToday and ServiceLevelCallsOfferedToday.	DBFLT4	NULL
ServiceLevelHalf	The service level for this call type during the current half-hour interval. [2]	DBFLT4	NULL

OverflowOutTo5	The number of calls that overflowed to another call type during the rolling five-minute interval. This field OverflowOutTo5increments when a requalify or call type node is executed in the script.	DBINT	NULL

Table 3

[1] *In an IPCC Enterprise Gateway deployment, ICM (parent) connected with an IPCC Enterprise with an IPCC System PG (child) or IPCC Enterprise (child) through IPCC Gateway PG, network queuing data is not available in the child or in the child agent/supervisor desktop. The time spent in the network queue is not included in the reporting metrics in the child. A call center manager who would normally only look at the IPCC child reports will need to also look at the parent ICM reports for network queuing data.*

[2] *This field is applicable to both ICM and IPCC Enterprise with the following exception: the field is not incremented if the call is answered by an agent on a standard ACD unless the call was translation routed.*

[3] *With the existence of a network VRU, for IPCC and for ICM systems in which calls are translation-routed, the measurement of Service Level begins when the call arrives at the routing script, or when its call type is changed. This means that its self-service is performed on a call before the call is queued to an agent, the routing script must be set up to change the call type of the call when self-service is completed. Otherwise, the time spent in self-service will negatively impact the Service Level.*

Skill_Group_Real_Time Table Fields

Field Name	Description	Data Type	Keys / Null Option
SkillTargetID	Foreign key from the Skill Group table. The SkillTargetID of the agent. Together with the SkillGroupSkillTargetID, identifies the skill group member.	DBINT	PK, FK, NOT NULL
DateTime	Central Controller date and time that this data was last updated.	DBDATETIME	NOT NULL
Avail	Number of agents for the skill group in Not_Active state with respect to skill group.	DBINT	NULL
BusyOther	Number of agents currently in the BusyOther state with respect to this skill group.	DBINT	NULL
CallsHandledTo5	The number of calls that were handled by the skill group during the current five-minute interval. This field is applicable for ICM, IPCC Enterprise and Outbound Option.	DBINT	NULL
Hold	The number of agents that have all active calls on hold. The agent is not in the Hold state with one call on hold and talking on another call (for example, a consultative call). The agent must have all active calls on hold.	DBINT	NULL

LoggedOn	Number of agents that are currently logged on to the skill group. This count is updated each time an agent logs on and each time an agent logs off.	DBINT	NULL
LongestCallQ	The date and time that the longest call in the queue for the skill group was placed in the queue. *This field is not applicable to IPCC Enterprise.* [1, 2]	DBDATETIME	NULL
NotReady	Number of agents in the Not Ready state for the skill group.	DBINT	NULL
PercentUtilization To5	Percentage of Ready time that agents in the skill group spent talking or doing call work during the rolling five-minute interval. This is the percentage of time agents spend working on calls versus the time agents were ready.	DBFLT4	NULL
ReservedAgents	Number of agents for the skill group currently in the Reserved state.	DBINT	NULL
TalkingIn	Number of agents in the skill group currently talking on inbound calls.	DBINT	NULL
TalkingOther	Number of agents in the skill group currently talking on internal (neither inbound nor outbound) calls. Examples of other calls include agent-to-agent transfers and supervisor calls.	DBINT	NULL
TalkingOut	Number of agents in the skill group currently talking on outbound calls.	DBINT	NULL
RouterCallsQNow	Number of calls currently queued for the skill group at the CallRouter. [1] *This field does not include local ACD calls not routed by ICM. Such calls are counted in the CallsQueuedNowfield of Skill_Group tables.*	DBINT	NULL
CallsQueuedNow	The number of calls currently queued to this skill group by the ACD. This field represents local queue counts at the ACD. It is incremented only in the event of local queuing. In the event of Network Queuing, the field incremented in RouterCallsQNow.	DBINT	NULL

Table 4

[1] *In an IPCC Enterprise Gateway deployment, ICM (parent) connected with an IPCC Enterprise with an IPCC System PG (child) or IPCC Enterprise (child) through IPCC Gateway PG, network queuing data is not available in the child or in the child agent/supervisor desktop. The time spent in the network queue is not included in the reporting metrics in the child. A call center manager who would normally only look at the IPCC child reports will need to also look at the parent ICM reports for network queuing data.*

[2] *This is not applicable for IPCC Enterprise without an IPCC System PG and is not updated. In IPCC Enterprise with an IPCC System PG, this field is applicable and is updated when a call is queued to the skill group. For consistent values, in IPCC Enterprise regardless of whether or not there is an IPCC System PG, use RouterLongestCallInQ.*

Service_Real_Time Table Fields

Field Name	Description	Data Type	Keys / Null Option
SkillTargetID	Foreign key from Service table.	DBINT	PK, FK, NOT NULL
DateTime	Central Controller date and time that this data was last updated.	DBDATETIME	NOT NULL
AgentsTalking	Number of service agents currently in the talking state.	DBINT	NULL
AvgDelayQNow	Average delay for calls currently in queue for the service.	DBINT	NULL
AvgSpeedAnswerTo5	Average answer wait time for all calls offered to the service during the rolling five-minute interval:AnswerWaitTimeTo5 / CallsAnsweredTo5.	DBINT	NULL
CallsAbandQHalf	Number of calls to the service abandoned while in queue or ringing during the current half-hour interval. [1]	DBINT	NULL
CallsAbandQTo5	Number of calls to the service abandoned while in queue or ringing during the rolling five-minute interval. [1]	DBINT	NULL
CallsAbandQ Today	Number of calls to the service abandoned while in queue or ringing since midnight. [1]	DBINT	NULL
CallsAnswered Half	Number of calls to the service answered by agents during the current half-hour interval.	DBINT	NULL
CallsAnsweredTo5	Number of calls to the service answered by agents during the rolling five-minute interval.	DBINT	NULL
CallsAnswered Today	Number of calls answered by service agents since midnight.	DBINT	NULL
CallsHandledHalf	Number of calls handled for this service during the current half-hour interval.	DBINT	NULL
CallsHandledTo5	Number of calls to the service handled during the rolling five-minute interval.	DBINT	NULL
CallsHandled Today	Number of calls handled for this service since midnight.	DBINT	NULL
CallsIncomingHalf	Number of incoming calls for this service during the current half-hour interval. [2]	DBINT	NULL
CallsIncomingTo5	Number of incoming calls to the service during the rolling five-minute interval. [2]	DBINT	NULL

CallsIncoming Today	Number of incoming calls for this service since midnight.	DBINT	NULL
CallsInNow	Number of incoming calls for the service currently in progress.	DBINT	NULL
HandleTimeHalf	The total hold time in seconds for calls to the service that ended during the current half-hour interval.	DBINT	NULL
LongestCallQ	Time that the longest call in the queue for the service was put there.	DBDATETIME	NULL
ServiceLevelHalf	ICM service level for the service during the current half-hour interval.	DBFLT4	NULL
ServiceLevelTo5	ICM service level during the rolling five-minute interval.	DBFLT4	NULL
ServiceLevelToday	ICM service level for the service since midnight.	DBFLT4	NULL
ServiceMode Indicator	The current mode of the service: **1** = Day service **2** = Night service **3** = Closed with answer **4**= Closed, no answer **5** = Transition **6**= Open **13** = Pilot Status Other. ***Note*:** This field may also be used to encode overflow information for a Galaxy ACD.	DBINT	NULL

Table 5

[1] *When ICM is connected with IPCC through an IPCC Gateway PG, this value is incremented by any condition on the child that causes the call to terminate while in the queue.*

[2] *Incoming calls include only inbound ACD calls arriving on trunks (that is, calls that are not internally generated).*

Appendix B: WebView

Refer to Figure 16, Figure 17, and Figure 18 for sample WebView Help screens.

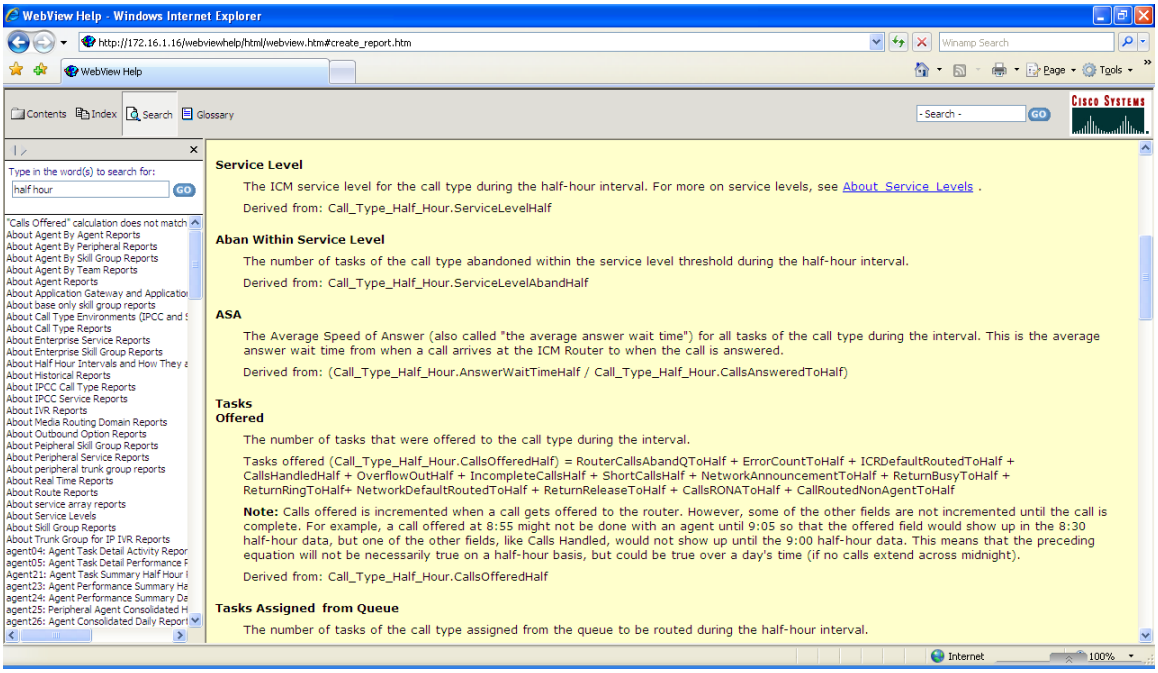

Figure 16

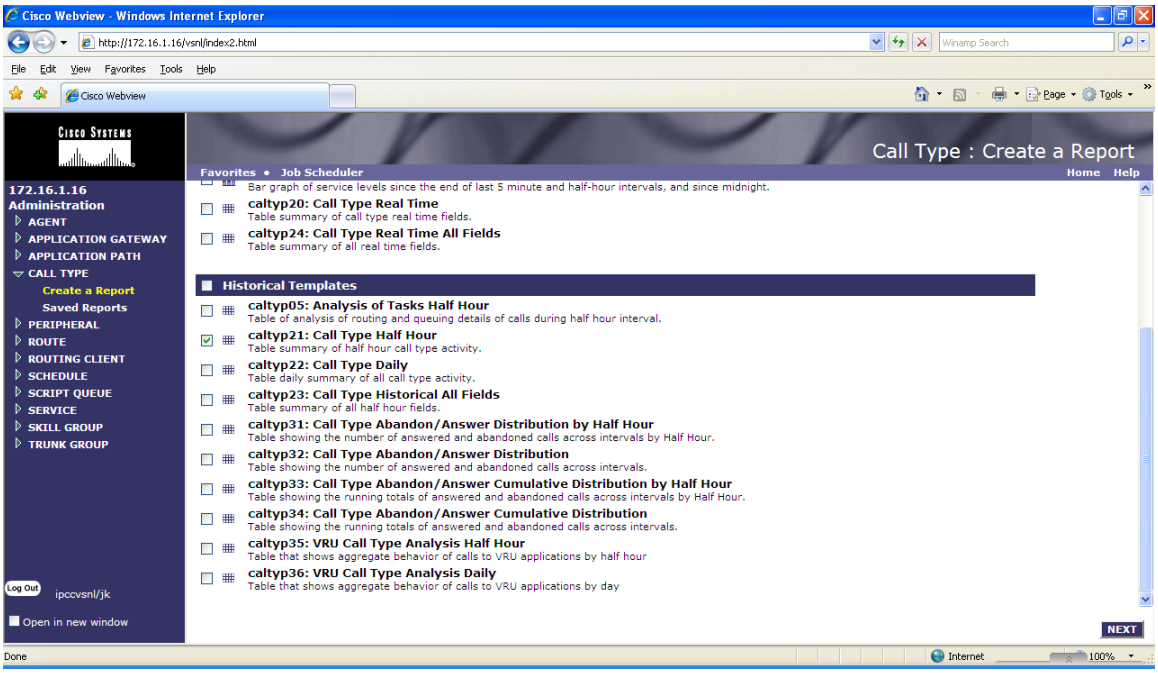

Figure 17

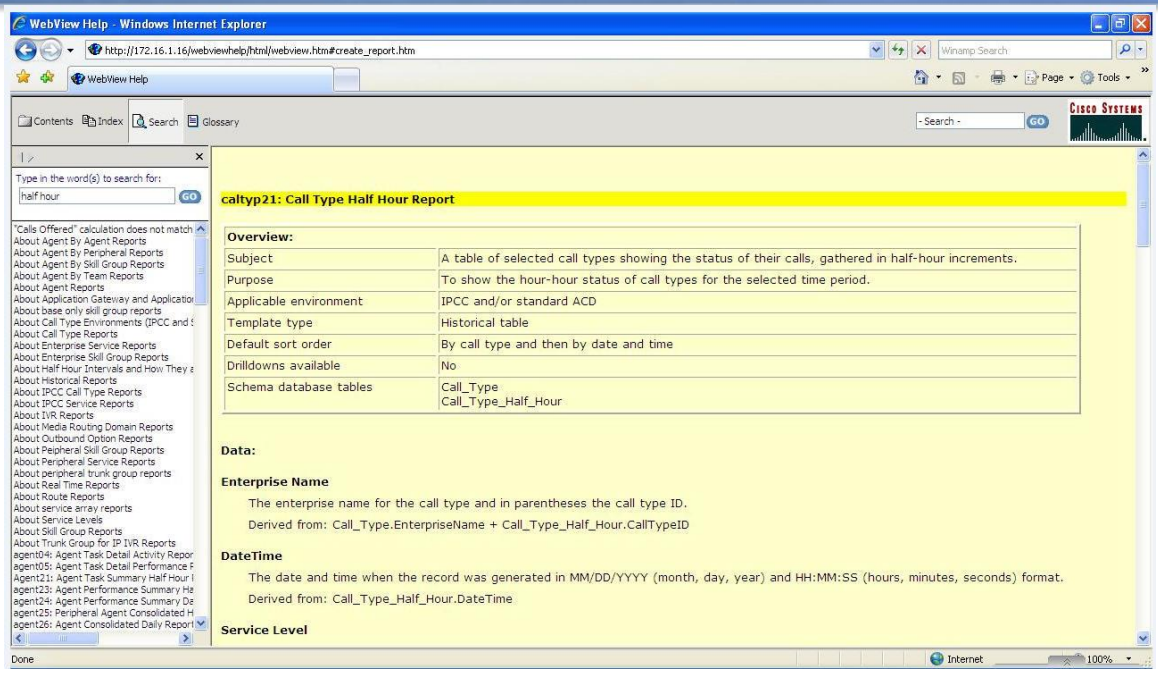

Figure 18

Appendix C: Sample SQL Statements

NOTE: The AW & Historical databases look identical, containing the same table structures, but only the AW is updated with real-time information, and only the historical contains historical data.

More sample SQL queries are available here.

For internal use only.

```
select

  CallTypeID,
  RouterCallsQNow,
  AnswerWaitTimeTo5,
  CallsAnsweredTo5,
ServiceLevelTo5=
    CASE
    WHEN
                ServiceLevelTo5  is NULL
    THEN
0
    ELSE
                    ServiceLevelTo5

    END,
  AvgRouterDelayQToday=
    CASE
    WHEN
                AvgRouterDelayQToday  is NULL
    THEN
0
    ELSE
    AvgRouterDelayQToday

    END,
  CallsHandledToday
```

Figure 19

