User's Guide

Context Services 8.1.x

1/2/2022

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Context Services User's Guide

Purpose

The Universal Contact Server 8.1 Context Services User’s Guide describes the Context Services functionality of Universal Contact Server (UCS), and includes deployment information.

These pages are valid for all 8.x releases of this product and cover:

- Features
- Product architecture
- Introduction to the API

Description

Context Services's REST APIs provide access to UCS (Universal Contact Server) resources (data entities) via URI paths. To use a REST API, your application will make an HTTP request and parse the response. By default, the response format is XML. If you wish, you can request JSON instead of XML. Because the REST API is based on open standards, you can use any web development language to access the API.

About UCS

Universal Contact Server (UCS) interfaces with a database that stores data on contacts (customers). As the classic UCS, it works with Genesys eServices (Multimedia). With an optional set of additional capabilities known as Context Services, it works with other Genesys products and solutions, such as Genesys Voice Portal and Conversation Manager.

Note the following terminology:

- *UCS/CS* is used when describing the Context Services capabilities.
- *Classic UCS* refers to UCS apart from Context Services.

Scope of Use

Typical usage scenarios of Context Services include:

- Customer identification
- Service resumption
- Customer profile (retrieval and management)
- Callback offers
- Service resumption with an agent

- Proactive notification
- Schedule callback with enhancement multimedia confirmation

New Features

New Features

8.1.3

The 8.1.3 release of March 2013 includes the following new features:

- Ability to load balance multiple Context Service processes against a single database instance.
- Ability to delete Context Services customer profiles.
- Ability to merge multiple Context Services customer profiles.
- Ability to edit the Knowledge Library through PSDK/UCS ESP API.
- Documentation of the method forgrouping customer profiles in Context Services.
- Support for client-side port functionality.
- Additional operating system and database environment support (see the Genesys Supported Operating Environment Reference Guide for a full list of supported operating systems and databases).

8.1.2

The 8.1.2 release of October 2012 includes the following new features.

- Ability to use full text search in a primary/backup environment.
- Access logging for the UCS database.
- Cache improvements to reduce memory footprint.

8.1.1

The 8.1.1 release of May 2012 includes the following new features.

- Ability to run multiple UCS instances in a single tenant
- New start and finish log messaging for UCS/CS archiving operations, enabling alerting in Solution Control Interface

8.1.0 Maintenance Release

The 8.1.0 maintenance release of October 2011 adds:

- Enhancements to bulk import of customer profile data:
  - Use of roles

  - Log output
  - Ability to restart at a specified index
  - Prevention of duplicate inserts
- Ability to configure multiple listening ports in Configuration Manager
- Ability to configure TLS with ESP (Genesys External Services Protocol) in Configuration Manager
- Support of TLS connection to Configuration Server

8.1.0

The 8.1.0 release includes the following new features. These features apply to UCS/CS only.

- Bulk customer profile import—Ability to import large amounts of profile data using a POST query
- Service data purging—Ability to Configuration Options Only to Schedule Pruning schedule service purging (pruning) using configuration options alone
- Role-based access control—Control access to profiles, services, states, tasks, and other objects Access Control using Roles
- Security log filtering—Ability to control printing of attached data in logs.
- Multiple user authentication—Option to configure login credentials per client.
- Agent history search—Enhancement of UCS database schema enabling ability to search for all interactions handled by a specified agent, regardless of the contacts involved
- Configuration Access Layer—UCS access to Configuration Server refactored to use Platform SDK rather than Genesys Config Library
- Database encryption—Supported for MS SQL Server 2008 and Oracle 11g

Prepare your Deployment

Purpose

Describes all of the required procedures for deploying UCS and its Context Services capabilities. For a description of deploying UCS as part of an eServices solution, see the *eServices Deployment Guide.*

Prerequisites

Functioning environment including:

- Management Framework: DB Server, Configuration Server.
- Genesys Administrator or Configuration Manager.
- RDBMS, either Oracle or Microsoft SQL.
- Java Environment and Libraries for eServices and UCS. This is a single component provided on your UCS product CD.

Setting up the UCS Database

Purpose: To set up the database or databases that UCS will use.

Prerequisites

RDBMS, either Oracle or Microsoft SQL. See also the *eServices 8.0 Deployment Guide.* See the Deployment category page for overall prerequisites for deploying UCS.

Procedure

1. Create a database in your RDBMS.
2. Locate scripts in `\Universal Contact Server\<application-name>\sql_scripts\<RDBMS-type>`.
3. Run `ucs-<RDBMS-type>.sql` for a new installation or choose the proper upgrade script for your RDBMS type.
   For an existing UCS database, run all scripts that cover your existing version, the current version, and all versions in between. For example, to upgrade from 7.6.1 to 8.0.2, you must run
   1. upgrade_<RDBMS-type>_7.6.1_to_8.0.0.sql
   2. upgrade_<RDBMS-type>_8.0.0_to_8.0.1.sql
   3. upgrade_<RDBMS-type>_8.0.1_to_8.0.2.sql

      Genesys supplies upgrade scripts for all releases starting with 7.0.1.

Special Information for Oracle RAC

DAP Configuration

To connect UCS to an Oracle Real Application Cluster (RAC), configure a DAP for UCS as follows:

- Use the first node's host and port settings on the `Server info` tab.
- For the host, port, and ONS settings of each additional node, create options in the `settings` section, as follows. Note that the ONS settings are optional.
  - Name: ONSConfiguration
    Value: nodes=node1:node1port,node2:node2port, ... where port is the ONS port, usually 6251
  - Name: hostx, where x is a positive integer

Value: host of RAC

- Name: portx, where x is a positive integer matching one of the hostx options
  Value: DB port of RAC, usually 1521

Here is an example configuration for three nodes, named rac1, rac2, and rac3. The DB port is 1521 and the ONS port is 6251 for all nodes.

```
[ServerInfo]
host: rac1
ports: default, 1521
[Options > settings]
ONSConfiguration: nodes=rac1:6251,rac2:6251,rac3:6251
host1: rac2
port1: 1521
host2: rac3
port2: 1521
```

UCP Library

Starting with the 8.1 release, support of Oracle RAC also requires that you deploy the Universal Connection Pool library, which Genesys is not able to deliver with the installation package. To deploy the UCP library:

1. Download the `ucp.jar` file, version 11.2.0.1.0 or higher, from the Oracle web site:
   http://www.oracle.com/technetwork/database/features/jdbc/index-091264.html
2. Copy the jar file to the UCS home folder in `./lib/db/oracle`

When connected to an Oracle RAC configuration, the UCS database layer uses this jar file for connection handling. If UCS is started against an Oracle RAC without `ucp.jar`, it will fail to start.

Next Steps

Configure a Database Access Point (DAP).

Configure DAP

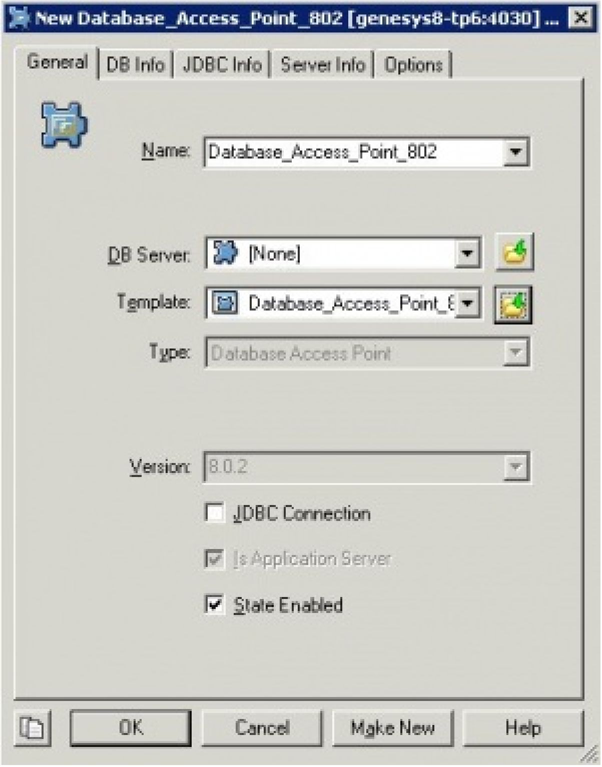
Purpose: To set up the DAP (Database Access Point) that UCS will use.

Prerequisites

RDBMS, either Oracle or Microsoft SQL. See also the *eServices 8.0 Deployment Guide.*

Procedure

1. Create a new DAP, using the appropriate template. On the General tab:



New Database_Access_Point_802 [genesys8-tp6:4030] ...

Name: Database_Access_Point_802

DB Server: [None]

Template: Database_Access_Point_8

Type: Database Access Point

Version: 8.0.2

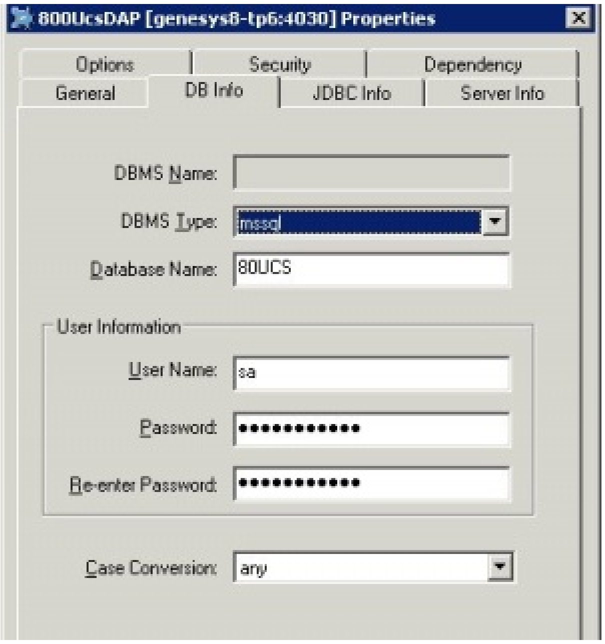
□ JDBC Connection

☑ Is Application Server

☑ State Enabled

    1. Enter a name for the DAP.
    2. Do not enter anything in the DB Server field.
    3. Select `Enable JDBC access.`

2. On the Database Information tab:



DBMS Name:

DBMS Type: mssql

Database Name: 80UCS

User Name: sa

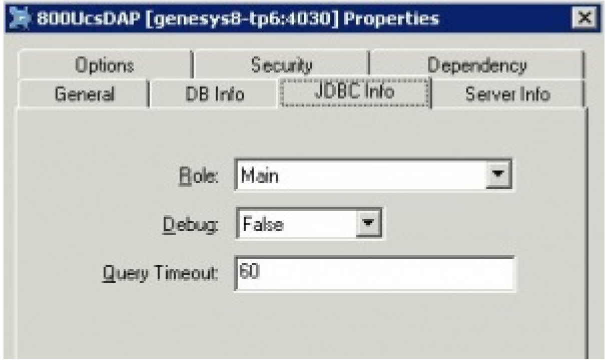
Password: ●●●●●●●●●●●●

Re-enter Password: ●●●●●●●●●●●●

Case Conversion: any

1. Enter the DBMS type, database name, user name, and password.
2. Set Case Conversion to any, and leave the DBMS Name field clear.

3. On the JDBC Info tab, enter the role (Main).

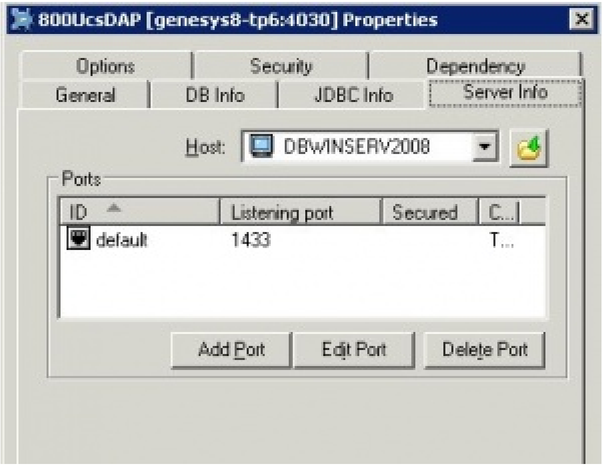


Role: Main

Debug: False

Query Timeout: 60

4. On the Server Info tab, enter the host name and port number.



800UcsDAP [genesys8-tp6:4030] Properties

Host: DBWINSERV2008

Ports

ID	Listening port	Secured	C...
default	1433		T...

Important

To connect to an Oracle RAC (Real Application Cluster), see this additional information.

Next Steps

Configure a UCS Application object.

Configure UCS Application

Purpose: To configure a UCS Application object.

Prerequisites

It is preferable to set up the database and configure a DAP before creating the UCS Application object.

Procedure

1. On the General tab, enter a name.
2. On the Server Info tab, enter a host name and port number.
3. On the Start Info tab, enter an arbitrary character. The real values will be entered during installation.
4. On the Connections tab, add connections to the UCS DAP, Message Server, and Stat Server.

    The underscore character (_) is not supported for host names that UCS connects to. Having this character in a host name can result in unstable behavior, such as inability to connect to the target host. Note that RFC 1123, section 2.1 "Host Names and Numbers" limits host names to letters, digits, and hyphen. If a host that UCS connects to contains underscore in its name, Genesys recommends that you create an alias and change the host name in the Configuration Layer.
5. On the Options tab, in the `cview` section:
    1. Set `enabled` to `true`.
    2. Set `port` to the port on which the web services will be deployed (the default is 8080).
    3. Set `tenant-id` to the identifier of the tenant with which UCS will be associated.
    4. Set other configuration options as needed. All options are described on the Configuration Options page.

Next Steps

1. Optionally, configure UCS to use TLS.
2. Optionally, configure role privileges for UCS.
3. Install UCS. Installing UCS is a simple matter of launching the installation entering Configuration Server login information.

Export Certificates

Purpose: Describes using Microsoft Managment Console to export digital certificates.

Procedure

If you have generated a Windows certificate, as described in the "Certificate Generation and Installation" chapter of the *Genesys Security Guide,* you must use Microsoft Management Console to make the certificate usable by UCS, as follows:

1. From the Windows Start menu, select `Run`, then execute the `mmc` command to start Microsoft Management Console.
2. In the Trusted Publishers folder, select the certificate that you assigned to your host in the Genesys configuration environment. Right-click and select `Export` to launch a wizard.
3. Click `Next` in the first pane of the wizard.
4. Select `Yes, export the private key.`
5. Select `Personal Information Exchange - PKCS #12 and Enable strong protection.`
6. Enter a password.
7. Enter a file name (such as `certificate.pfx`) and select the location to save it.

Next Steps

Configure UCS to use the certificate, as described in Using TLS with UCS.

Using TLS with UCS

Purpose: To set up UCS to use TLS.

Overview

This page describes setting up UCS to use TLS for secure connections. The procedure can also be used with E-mail Server, a component of Genesys eServices. For clients of UCS, see Using TLS with UCS Clients. This page refers to keytool, which is a key and certificate management utility included in JDK or JRE installations. For instance, when you install JDK, keytool is placed in the `\bin` directory.

> **Important**
>
> Starting with release 8.1.3, the TLS options are configured as described in the *Framework 8.5 Configuration Options Reference Manual.*

Procedure

1. Generate a certificate, in any of the following ways:
    - Use Windows Certificate Services, as described in the "Certificate Generation and Installation" chapter of the *Genesys 8.1 Security Deployment Guide.*
    - Use keytool with the–genkey parameter; for example:

      ```
      keytool -genkey -v -alias hostname.example.com

      -dname "CN=hostname.example.com,OU=IT,O=ourcompany,C=FR" -keypass theKeyPassword

      -keystore certificate.jks -storepass theKeystorePassword -keyalg "RSA" -sigalg "SHA1withRSA"

      -keysize 2048 -validity 3650
      ```

    - Use any other tool, such as openSSL.
2. In the Genesys configuration environment, assign the certificate to the Host on which UCS is running, as described in the "Genesys TLS Configuration" chapter of the *Genesys 8.1 Security Deployment Guide.*
3. If you generated a Windows certificate, you must use Microsoft Management Console to make the certificate usable by UCS.
4. Locate the certificate and copy it to a selected location on UCS’s host.
5. Set configuration options in your UCS Application object. Starting with release 8.1.3, the TLS options are

configured as described in the *Genesys 8.1 Security Deployment Guide.*

Next Steps

Optionally, configure the clients of UCS to use TLS, as described in the Using TLS with UCS Clients page.

8.1.0 Maintenance Release

The 8.1.0 maintenance release of October 2011 adds the possibility of performing the following TLS-related configuration on the `Server Info` tab (Configuration Manager) or section (Genesys Administrator):

- Configure multiple ports
- Set Secured = Yes, in which case UCS starts in TLS mode
- Specify the connection protocol as ESP or HTTP

Note these limitations:

- Only one certificate per protocol can be configured for one UCS.
- There must be a default port that uses ESP and is associated with a valid certificate.
  - This is the port marked `default` on the Server Info tab (Configuration Manager) or the Server Info section of the Configuration tab (Genesys Administrator).
  - You can leave its connection protocol unspecified, in which case it uses ESP. What you must not do is specify any other protocol for it.
  - If the server is not able to start listening on this port, then an exception is raised and the server exits.

Using TLS with UCS Clients

Purpose: Set up clients of UCS to use TLS.

Overview

Procedures differ according to whether the client is integrated into the Genesys system.

Integrated Applications

To connect the client in a secured mode, execute the "Configuring a secure client connection" procedure in the "Genesys TLS Configuration" chapter of the *Genesys Security Guide.*

Non-Integrated Applications

Applications that are not integrated into the Genesys system must verify the public key. One way to do this is to import the public key using keytool, as in the following example for a Java client:

1. Export the certificate. The following is an example command line:
   ```
   keytool -export -v -alias hostname.example.com -file certificate.cer

   -keystore certificate.jks -storepass theKeystorePassword
   ```
2. Import the certificate on all clients of UCS. The following is an example command line:
   ```
   keytool -import -alias hostname.example.com -file certificate.cer

   -keystore .keystore -storepass anotherPassword
   ```
3. Copy this certificate (public key) to a location on the client host.
4. Configure the client to point to this imported certificate. The way to do this depends on the client. As one example, with a Java application, you can start the application with a command line like the following:
   ```
   java -Djavax.net.ssl.trustStore="<CERTIFICATE_DIRECTORY>\<CERTIFICATE_FILE>"
    <application_name>
   ```

Configuration Options

Purpose: Lists the configuration options that your application can read.

Description

The tables in the following sections present the UCS configuration options that Context Services can read from the Configuration Layer:

- `cview` section—Options and values specific to Context Services.
- `archiving` section—Activates set-based archiving.
- `authentication` section—Enables and configures authentication control.
- `business-attributes` section—Maps Context Service keys to Business Attribute key-value pairs.
- `log-filter` section—Implements security log filtering.
- `log-filter-data` section—Also relates to security log filtering.

You can modify all these option values in the Configuration Manager. However, the change may not be effective immediately. For some options you have to restart UCS for changes to take effect (see the tables below). In Configuration Manager and Genesys Administrator, you can see many options other than those described here. They relate to UCS's functioning in eServices (short description **here**), and are described in the *eServices Reference Manual.*

Also, this page describes options that are displayed on the Options tab of the UCS Application object in Configuration Manager and Genesys Administrator. Some options that can be added to the Annex Tab in Configuration Manager, or to Advanced View (Annex) in Genesys Administrator, are described in Using Configuration Options to Schedule Service Pruning.

[cview] Section

This section adjusts the overall configuration of Context Services.

`cview` Section

Name	Restart UCS<ref name="restart">This column indicates whether you must restart UCS for changes in the option value to take effect.</ref>	Description
enabled	Yes	• `true` to enable Context Services functionality in UCS<ref name= "ucs">Universal Contact Server</ref>. • `false` (default) to disable Context Services.
port-http Deprecated since: 8.1.0	Yes	The HTTP port used to deploy UCS/CS (defaults to 8080). No longer available in 8.1. Releases 8.1 and later configure listening ports on the `Server Info` tab.
port-https Deprecated since: 8.1.0	Yes	The HTTPS port used to deploy UCS/CS (defaults to 8083). Deprecated since: 8.1.0. Releases 8.1 and later configure listening ports on the `Server Info` tab.
base-url	Yes	The base URL used to deploy Context Services. Based on this configuration, the services are available at the following URL: http://${ip-address}:${port}/${base-url}/${operation} Where: • ${ip-address} is the IP address configured below. • ${port} is the port on which the web services are deployed (see above). • ${base-url} is the base URL used to deploy Context Services. For example, if the ip-address is `192.168.1.1`, the port `8080`, and the base URL `cms`, the Set Server Mode operation would be available at the following URL: http://192.168.1.1:8080/cms/server/mode

Name	Restart UCS<ref name="restart">This column indicates whether you must restart UCS for changes in the option value to take effect.</ref>	Description
ip-address	Yes	IP address used to deploy Context Services (`localhost` by default).
data-validation	No	• `true` to enable data validation, which enforces additional checks on data provided by the connected clients. • `false` to disable data validation.
keyPassword Deprecated since: 8.1.0	Yes	Password for the certificate. Deprecated since: 8.1.0. See the Security and Authentication page.
keystorePassword Deprecated since: 8.1.0	Yes	Password for the keystore file. Deprecated since: 8.10. See the Security and Authentication page.
keystorePath Deprecated since: 8.1.0	Yes	Path to standard JKS file. Deprecated since: 8.1.0. See the Security and Authentication page.
keystoreType Deprecated since: 8.1.0	Yes	JKS or other JSSE-supported type. Deprecated since: 8.1.0. See the Security and Authentication page.
start-mode	Yes	Start-mode of the server mode: • `maintenance` • production
tenant-id	Yes	Defaults to 101. Specifies the numeric tenant ID associated with Context Services: subsequent customer/contact records created through your application are associated with this tenant.
metadata-cache Available since: 8.0.3	No	• `true` to enable the caching of metadata in the memory.

Name	Restart UCS<ref name="restart">This column indicates whether you must restart UCS for changes in the option value to take effect.</ref>	Description
		• `false` to disable the metadata caching. In that case, each access to the metadata triggers a DB query. The cache contains metadata for contact attributes, identification keys, profiles, services, states and tasks extensions.

<references />

[archiving] Section

This section activates and deactivates set-based archiving. It is not present on the UCS template; you must create it. It contains just one option:

`archiving` Section

Name	Restart UCS<ref name="restart">This column indicates whether you must restart UCS for changes in the option value to take effect.</ref>	Description
use-np	Yes	• `true` to enable set-based archiving. • `false` (default) to disable set-based archiving.

<references />

[authentication] Section

This section configures authentication for clients connecting to UCS. Authentication, available since release 8.0.300.02, applies to UCS/CS only. See also:

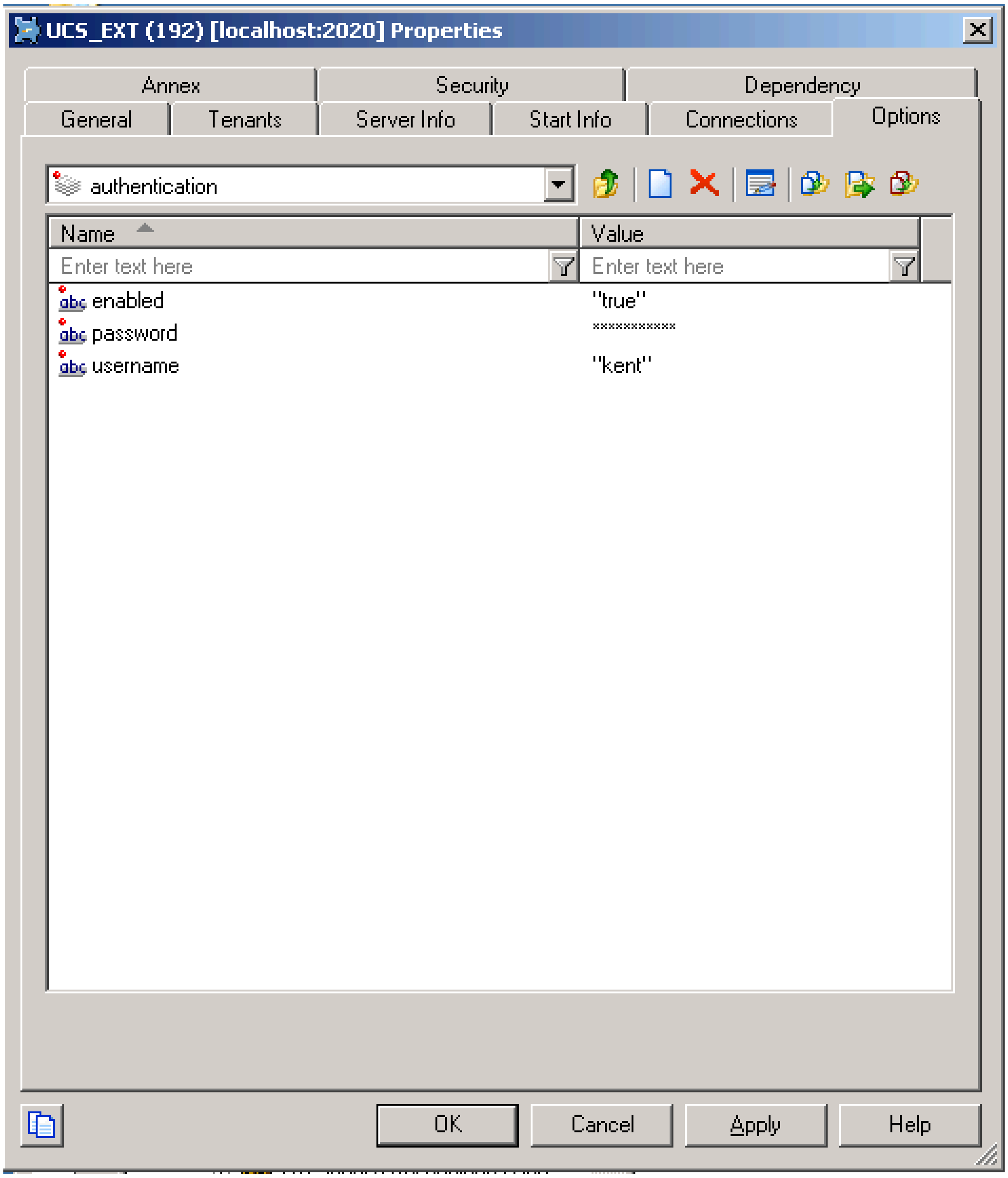
- The directly-related Basic Access Authentication page.

- Authentication on the Security and Authentication page.

authentication Section

Name	Restart UCS<ref name="restart">This column indicates whether you must restart UCS for changes in the option value to take effect.</ref>	Description
enabled	Yes	• false to disable authentication (default). • true to enable authentication.
mode	Yes	Authentication mode: • single-user to authenticate using UCS options (default). • multi-users to authenticate using Persons from Configuration Server.
password	Yes	Password to check the identity of the specified user. Effective only if mode is set to single-user.</tt>
username	Yes	User name allowed to connect to the Context Services API. Effective only if mode is set to single-user.</tt>
use-role	Yes	• false to disable the use of roles in authentication (default). • true to enable the use of roles in authentication.

<references />



UCS_EXT (192) [localhost:2020] Properties

Name	Value
enabled	"true"
password	***********
username	"kent"

Section 'authentication' in Configuration Manager.

[business-attributes] Section

This section defines the mapping between Context Services and the Business Attributes configured in the Genesys Configuration Server. The Business Attribute values are defined in the Tenant.

`business-attributes` Section

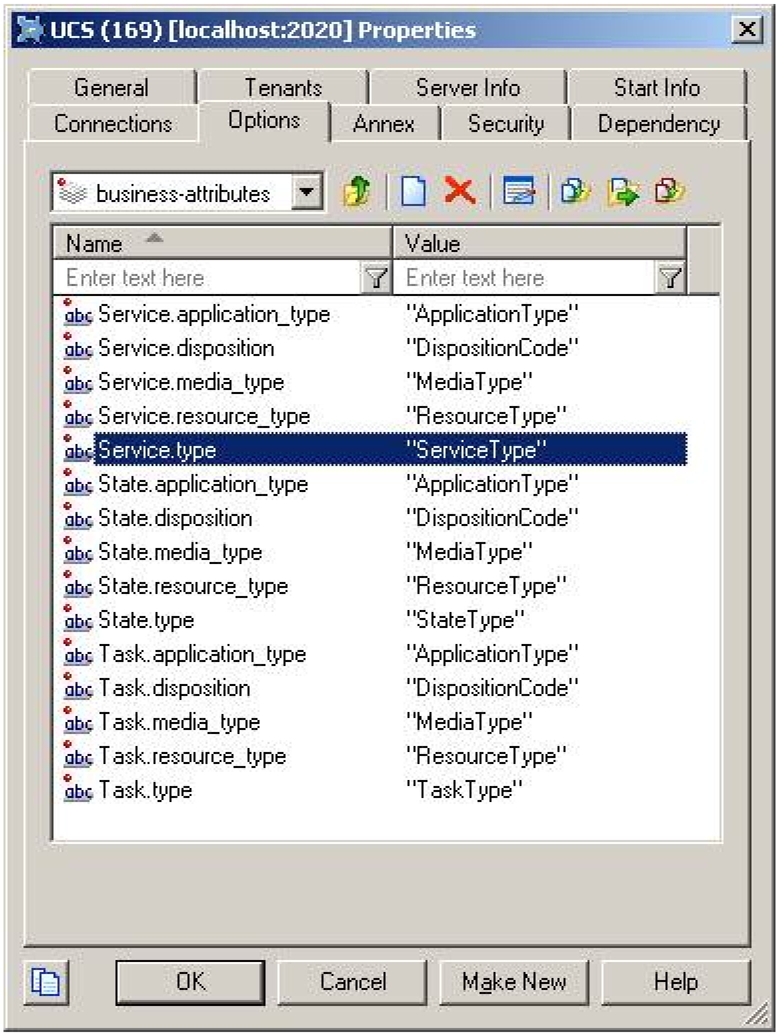
Name	Restart UCS<ref name="restart">This column indicates whether you must restart UCS for changes in the option value to take effect.</ref>	Description
${resource name}.${field name}	No	Associates a Business Attribute key with the name of the Business Attribute configured in the proper tenant. The option key name follows this syntax: ${resource name}.${field name} Possible ${resource name} values are: • Service • State • Task Possible ${field name} values to map are: • type (for service type) • disposition • application_type • resource_type • media_type Such as, for instance: Service.service_type, Task.disposition, State.media_type. Notes: • if there is no configuration for a given field, Context Services automatically allows any valid integer value for this field. In this case, your application is responsible for the value's validity. • A Business Attribute can be mapped to several resource fields. For instance, the Service.media_type and Task.media_type string can both point to "MediaType" Business Attributes.
map-names	No	Possible values are: • `true` to return the Names of Business Attribute Values

Name	Restart UCS<ref name="restart">This column indicates whether you must restart UCS for changes in the option value to take effect.</ref>	Description
		instead of DB IDs in the responses for GET operations. • `false` (default) to return the DB IDs of Business Attribute Values in the responses for GET operations.

<references />

Mapping Example

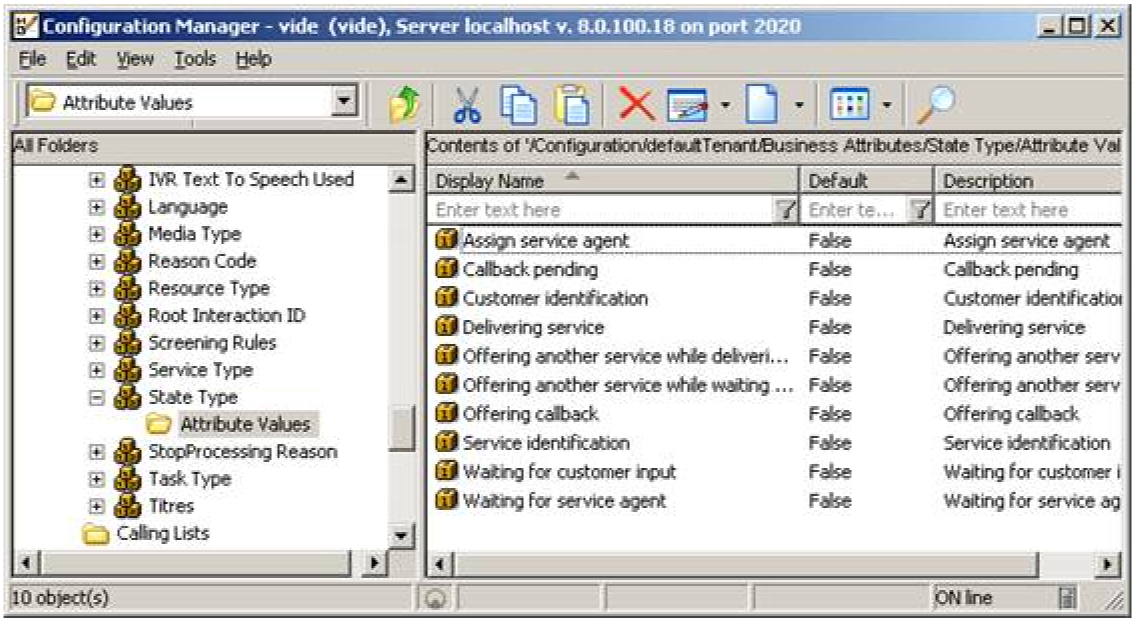
This first screenshot shows the section in UCS options, with the list of mapped keys, such as, for instance: Service.service_type, Task.disposition, State.media_type.



Name	Value
Service.application_type	"ApplicationType"
Service.disposition	"DispositionCode"
Service.media_type	"MediaType"
Service.resource_type	"ResourceType"
Service.type	"ServiceType"
State.application_type	"ApplicationType"
State.disposition	"DispositionCode"
State.media_type	"MediaType"
State.resource_type	"ResourceType"
State.type	"StateType"
Task.application_type	"ApplicationType"
Task.disposition	"DispositionCode"
Task.media_type	"MediaType"
Task.resource_type	"ResourceType"
Task.type	"TaskType"

Business Attribute Configuration in UCS Options

The following screenshot shows one of the mapped business attributes, the key and the associated values, which your application can retrieve in the result of GET operations by setting to `true` the map-names UCS options, as stated above.



Contents of '/Configuration/defaultTenant/Business Attributes/State Type/Attribute Val

Display Name	Default	Description
Enter text here	Enter te...	Enter text here
Assign service agent	False	Assign service agent
Callback pending	False	Callback pending
Customer identification	False	Customer identificatio
Delivering service	False	Delivering service
Offering another service while deliveri...	False	Offering another serv
Offering another service while waiting ...	False	Offering another serv
Offering callback	False	Offering callback
Service identification	False	Service identification
Waiting for customer input	False	Waiting for customer i
Waiting for service agent	False	Waiting for service ag

Related State Type Business Attribute

[log-filter] Section

This section contains general settings for how or whether user data keys appear in the logs. Its settings can be overridden for specified keys by options in the `log-filter-data` section.

`log-filter` Section

Name	Restart UCS<ref name="restart">This column indicates whether you must restart UCS for changes in the option value to take effect.</ref>	Description
default-filter-type	No	Sets the default for filtering the output of user data keys to the UCS server log. Possible values: • `skip`—Does not output key-value pairs. • `hide`—Outputs the keys but hides their values. • `copy` (default)—Outputs both the keys and their values. This default filter applies to all user data keys, except that is is overridden by any settings for individual keys in the `log-`

Name	Restart UCS<ref name="restart">This column indicates whether you must restart UCS for changes in the option value to take effect.</ref>	Description
		filter-data section.
filter-depth	No	Depth used while filtering nested key-value pairs. The default is 99. Any value greater than this is not checked. Using a high value can result in lower performance in the case of deeply nested key-values.

<references />

[log-filter-data] Section

This section enables you to override the log-filter section's setting for one or more specific data keys. You do this by creating options with the name <keyname> and the value <filtering mode>, where:

- <keyname> is the user data key affected.
- <filtering mode> is skip, hide, or copy, the same as the possible values of default-filter-type in the log-filter section.

UCS Role Privileges

Purpose: Describes the role privileges that are specific to UCS.

Description

Roles determine what actions a specified user may perform on a specified object. In UCS/CS, the user is most commonly an application; for further explanation, see Role-Based Access Control in the Context Services Developer's Guide. Privileges are assigned as configuration options in the `Role Privileges` tab of the Role object in Genesys Administrator.

To enable the use of roles, the `use-role` option must have the value `true`.

Framework 8.0 Genesys Administrator Help and the *Genesys Security Guide* provide general information on how to use Genesys Administrator and Management Framework to configure access permissions.

Privilege Groups

The following tables place privileges in related groups, as they appear in Genesys Administrator.

Customer related

Privilege
Create Customer Profile
Create Customer Profile Extension
Delete Customer Profile Extension
Read Customer Profile
Read Customer Profile Extension
Update Customer Profile
Update Customer Profile Extension

Service related

Privilege
Create Service Extension
Delete Service Extension
Read Service
Read Service Extension
Start Service

Privilege
Stop Service
Update Service Extension

State related

Privilege
Create State Extension
Delete State Extension
Read State
Read State Extension
Start State
Stop State
Update State Extension

Task related

Privilege
Create State Extension
Delete State Extension
Read State
Read State Extension
Start State
Stop State
Update State Extension
Create Task Extension
Delete Task Extension
Read Task
Read Task Extension
Start Task
Stop Task
Update Task Extension

Schema management related

Privilege
Create Id Keys
Create Profile Extension Schema
Create Service Extension Schema
Create States Extension Schema
Create Tasks Extension Schema
Read Business Attributes
Read Genesys Administrator Roles

Privilege
Read Id Keys
Read Profile Extension Schema
Read Service Extension Schema
Read States Extension Schema
Read Tasks Extension Schema

System management related

Privilege
Change server mode
Get content from interaction
Read server information

Security and Authentication

Purpose: Gathers together topics relating to security, encryption, authentication, and the like.

Database Encryption

For database encryption, Genesys recommends using Transparent Data Encryption (TDE):

- Oracle 11—Tablespace-level; see http://www.oracle-base.com/articles/11g/TablespaceEncryption_11gR1.php.
- MSSQL Server 2008—Database-level; see http://msdn.microsoft.com/en-us/library/cc278098(SQL.100).aspx.

Do not use column-level encryption.

Security Log Filtering

You can use configuration options in the log-filter and log-filter-data sections to control how or whether user data keys appear in the logs.

TLS

UCS/CS supports Transport Layer Security (TLS) in various ways:

- For UCS, see Using TLS with UCS and related pages. The procedures described also apply to E-mail Server.
- For clients of UCS, see Using TLS with UCS Clients.
- UCS/CS also supports secure connections to Configuration Server.

Authentication

When clients connect to UCS, there are two possible modes of authentication, specified by configuration options in the authentication section.

- Single-user—Clients connect using the user name and password specified by the UCS options username and password. This means all UCS clients must use the same credentials. To enable single-user authentication, give the `mode` option a value of `single-user`.

- Multi-User—Clients are configured as Persons in the Configuration Layer, and connect to UCS using the user name and password specified by their Person object. This means that each client can have its own credentials. To enable multi-user authentication, give the `mode` option a value of `multi-user`.

These and all other UCS/CS options are described on the Configuration Options page.

Role-Based Access Control

Role-based access control is available in UCS/CS starting in release 8.1.0. See

- UCS Role Privileges in this User's Guide.
- Role-Based Access Control in the Context Services Developer's Guide.

Multiple UCS Instances in Single Tenant

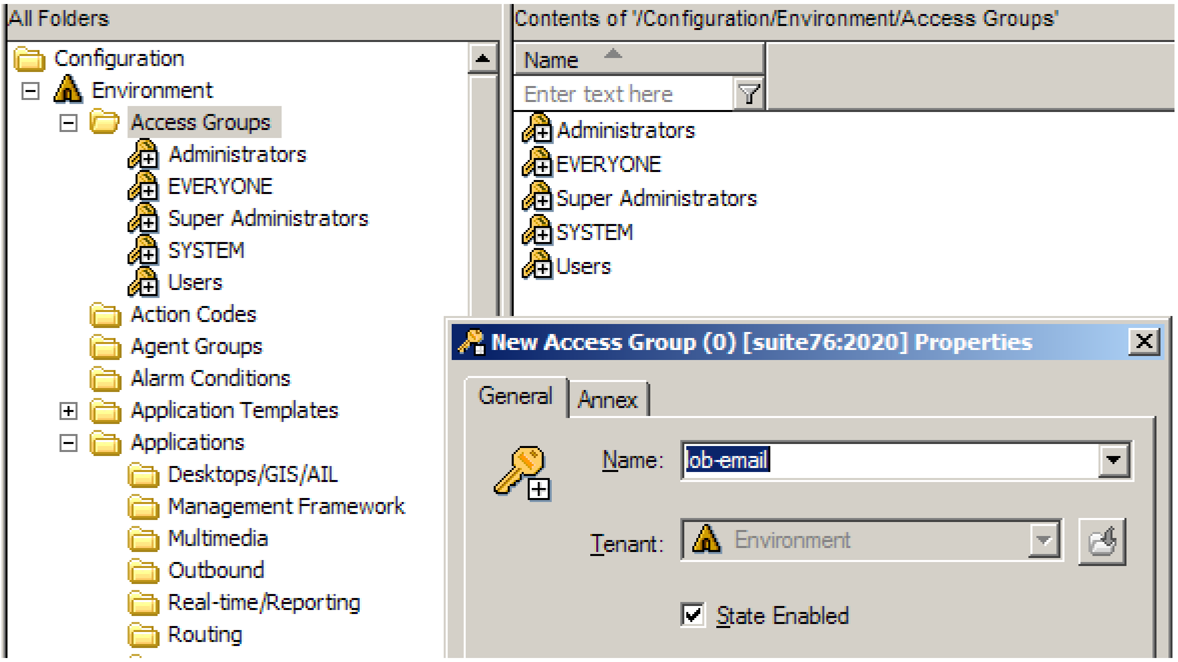
Purpose: describe a solution that enables multiple independent UCS instances to be deployed in a single tenant, based on the Access Group mechanism available in Configuration Server.

Overview

This solution uses access rights to restrict UCS instances from seeing objects that do not belong to them. Genesys components that access the Configuration Server database typically use the `system` account to access Configuration objects, granting the components global visibility. However, it is possible to use another account simply by changing the `logon as` option on the Security tab of the relevant Application object. One reason to use this solution relates to standard responses: If you have multiple UCS instances in a single tenant without restricted access, each instance will have access to the standard response library managed by the other instances. And if a UCS instance has access to a standard response library that it does not manage, it will keep deleting the standard responses from the Configuration Server database. The result will be that all instances will be repeatedly deleting other standard response libraries and re-creating their own. There is no need to use this configuration if you do not use standard responses and don't mind the UCS instances sharing each other's Contact and Interaction attributes. And of course these issues do not arise when the UCS instances are in different tenants. Different access groups represent different lines of business (LOB). This example uses two LOBs, e-mail, and chat.

Configuration Procedure

1. Create an access group for each Line of Business (LOB).



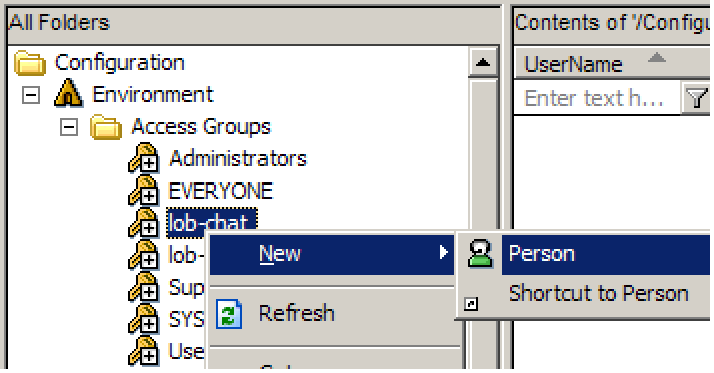
Name: lob-email

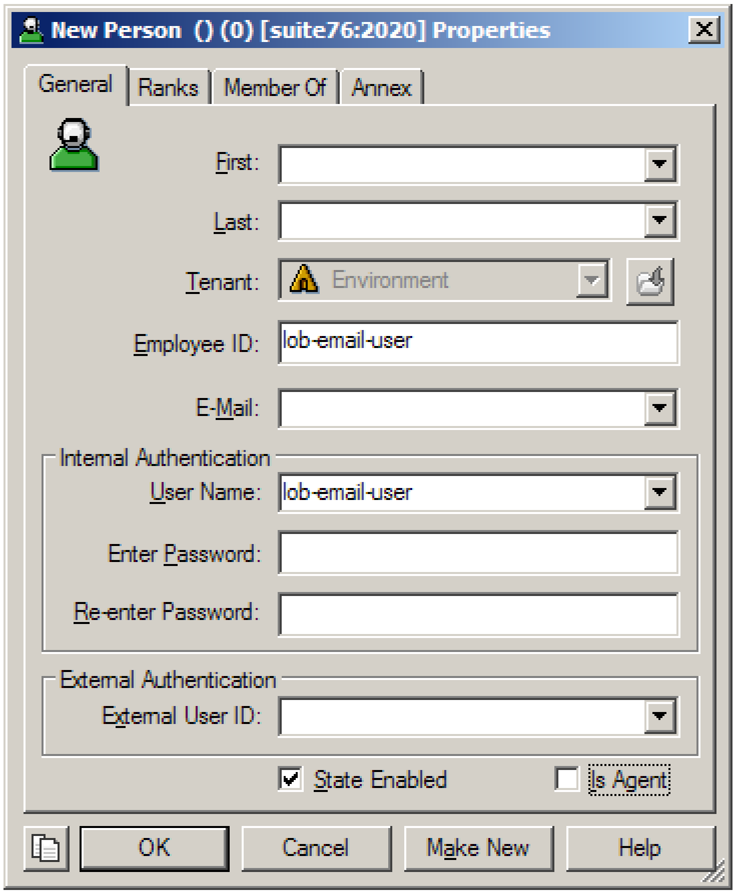
Tenant: Environment

☑ State Enabled

Figure 2: Creating Access Groups

2. Create a user for each of the access groups: right-click the access group, then select `New > Person`.





New Person () (0) [suite76:2020] Properties

First:

Last:

Tenant: Environment

Employee ID: lob-email-user

E-Mail:

Internal Authentication

User Name: lob-email-user

Enter Password:

Re-enter Password:

External Authentication

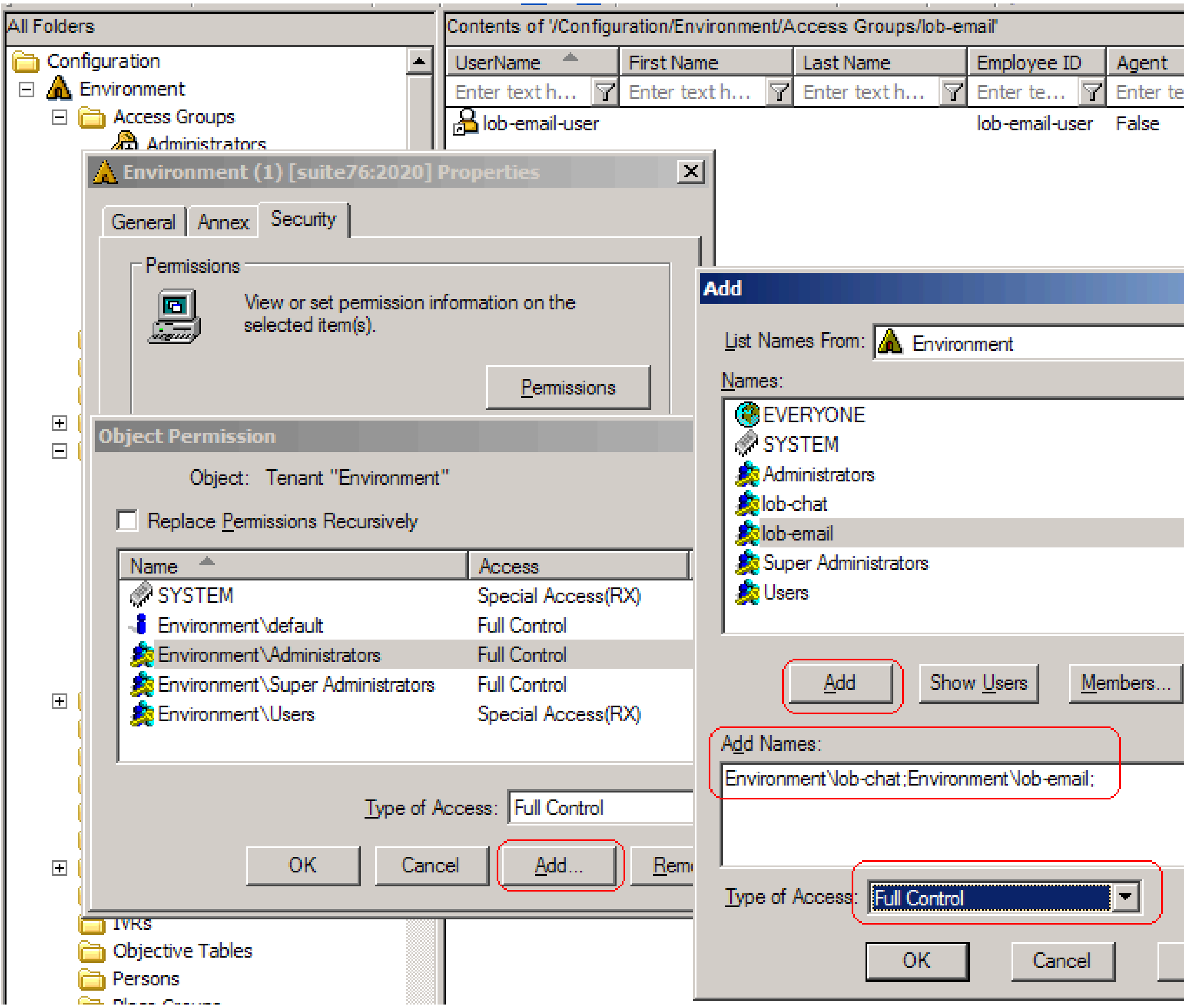
External User ID:

☑ State Enabled ☐ Is Agent

Figure 3: Creating a Person

3. Configure each access group's permission to access configuration objects:
   1. Right-click the tenant.
   2. On the `Security` tab, click `Permissions`.
   3. In the resulting Object Permission dialog, click `Add...`
   4. In the resulting Add dialog, click `Add` and select `Full Control`.

      Do this for Environment and all defined Tenants (multi-tenant environment), or for Environment and Resources (single-tenant). The figure below shows the process for the Environment tenant.



All Folders

- Configuration
  - Environment
    - Access Groups
      - Administrators
    - IVRs
    - Objective Tables
    - Persons

Contents of '/Configuration/Environment/Access Groups/lob-email'

UserName	First Name	Last Name	Employee ID	Agent
lob-email-user			lob-email-user	False

Environment (1) [suite76:2020] Properties

General | Annex | Security

Permissions

View or set permission information on the selected item(s).

Object Permission

Object: Tenant "Environment"

□ Replace Permissions Recursively

Name	Access
SYSTEM	Special Access(RX)
Environment\default	Full Control
Environment\Administrators	Full Control
Environment\Super Administrators	Full Control
Environment\Users	Special Access(RX)

Type of Access: Full Control

Add

List Names From: Environment

Names:

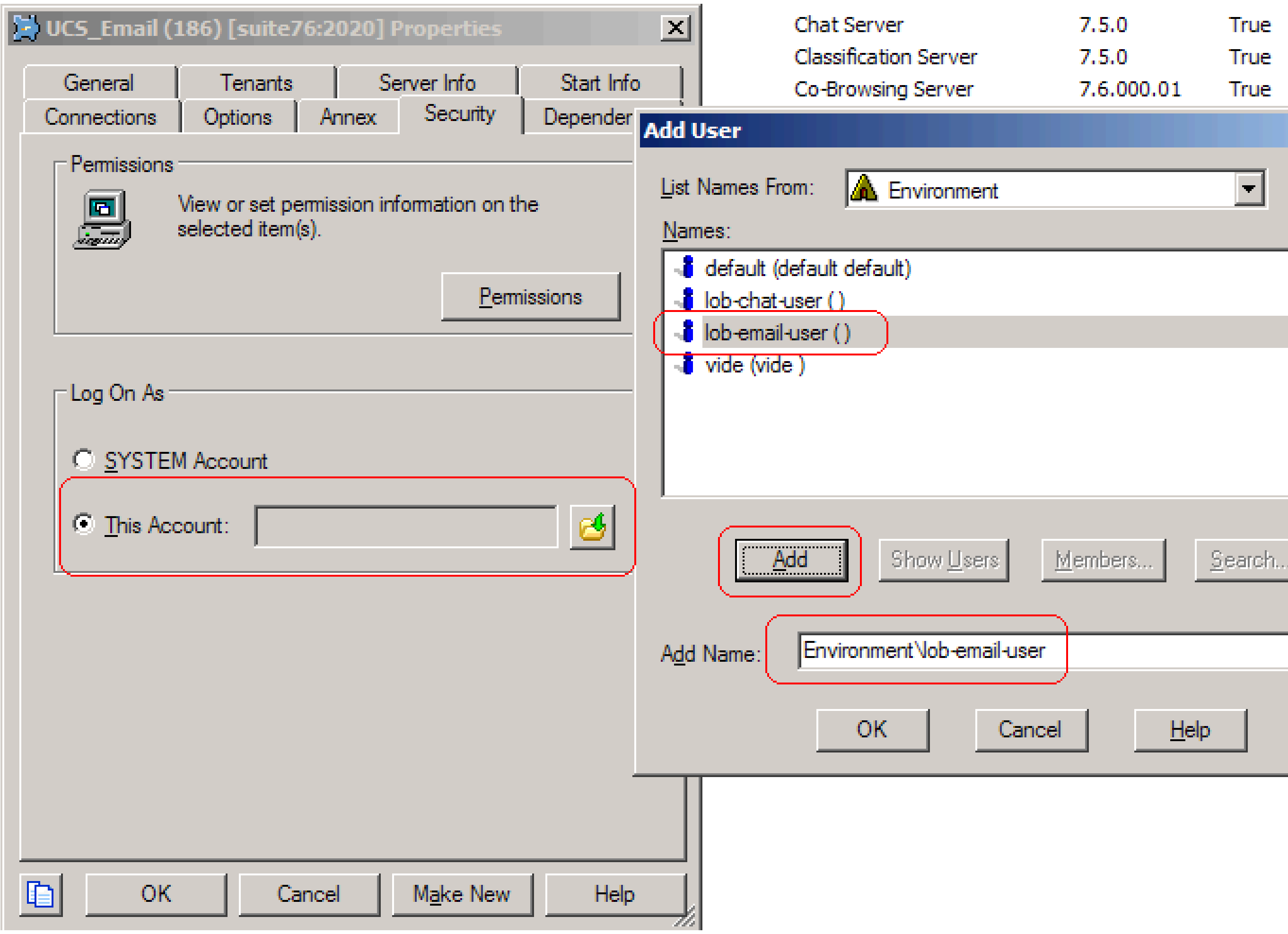
- EVERYONE
- SYSTEM
- Administrators
- lob-chat
- lob-email
- Super Administrators
- Users

Add Names: Environment\lob-chat;Environment\lob-email;

Type of Access: Full Control

Figure 4: Setting Tenant Permissions

4. On the `Security` tab of the UCS Application, set the `Log On As` option to associate this UCS with one of the created users, and hence with an access group.



Chat Server	7.5.0	True
Classification Server	7.5.0	True
Co-Browsing Server	7.6.000.01	True

○ SYSTEM Account

● This Account:

List Names From: Environment

- default (default default)
- lob-chat-user ( )
- lob-email-user ( )
- vide (vide)

Add Name: Environment\lob-email-user

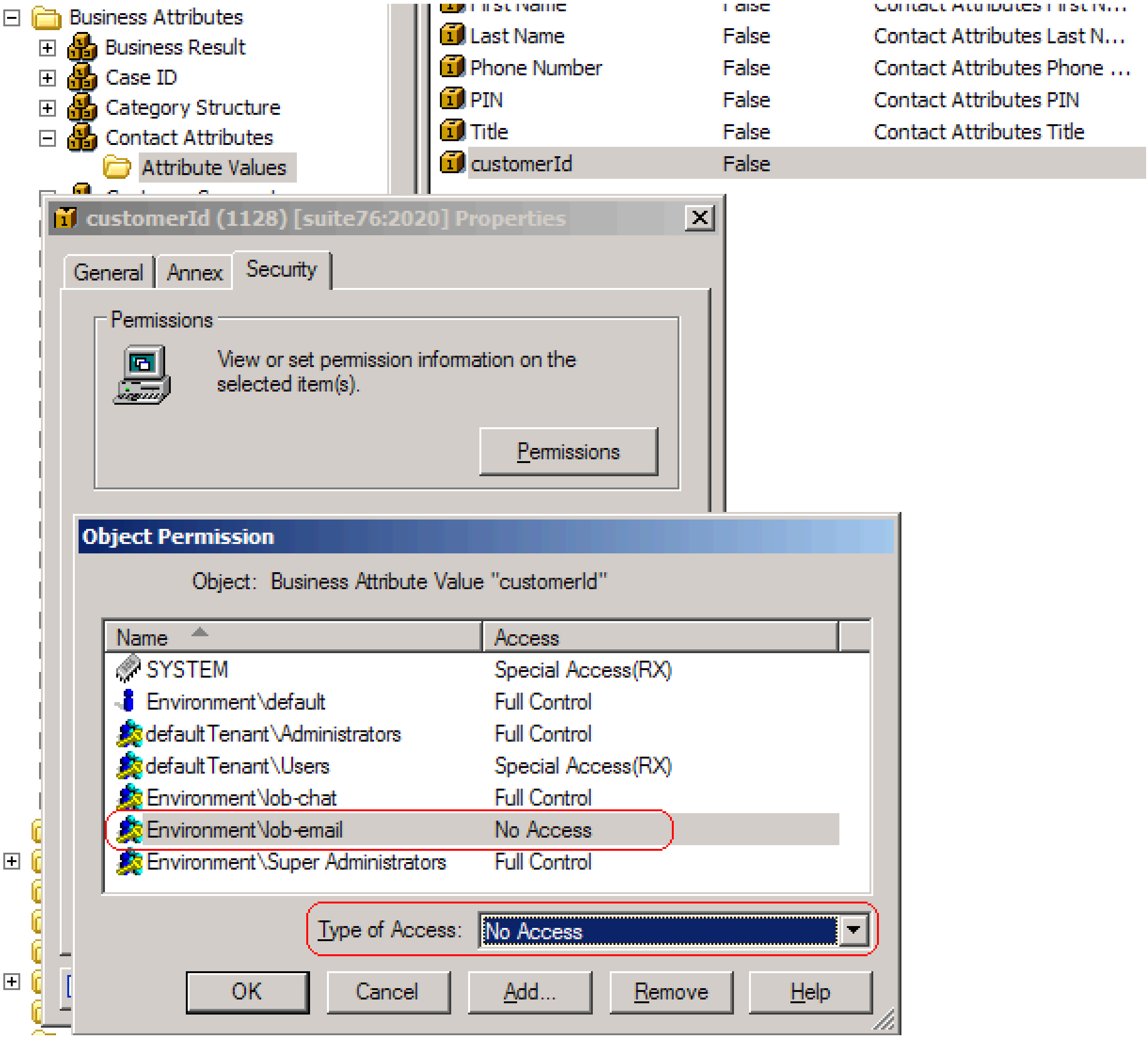
Figure 5: Setting the Log On As Account

The UCS is now able to access only the objects for which the access group has permissions.

5. Set permissions for attributes:
   Contact and Interaction Attributes are created in the Configuration Server database before being propagated to UCS. Therefore, in order to restrict a given attribute to one of the LOBs, you must specify permissions manually in the Configuration Server database.

   1. Right-click the desired `Attribute Value`.
   2. On the `Security` tab, click `Permissions`.
   3. In the resulting Object Permission dialog, click the various LOB groups and select the desired permissions.

   The figure below shows the `customerId` contact attribute being restricted to the Chat LOB.



First Name	False	Contact Attributes First N...
Last Name	False	Contact Attributes Last N...
Phone Number	False	Contact Attributes Phone ...
PIN	False	Contact Attributes PIN
Title	False	Contact Attributes Title
customerId	False	

customerId (1128) [suite76:2020] Properties

Permissions

View or set permission information on the selected item(s).

Object Permission

Object: Business Attribute Value "customerId"

Name	Access
SYSTEM	Special Access(RX)
Environment\default	Full Control
default Tenant\Administrators	Full Control
default Tenant\Users	Special Access(RX)
Environment\lob-chat	Full Control
Environment\lob-email	No Access
Environment\Super Administrators	Full Control

Type of Access: No Access

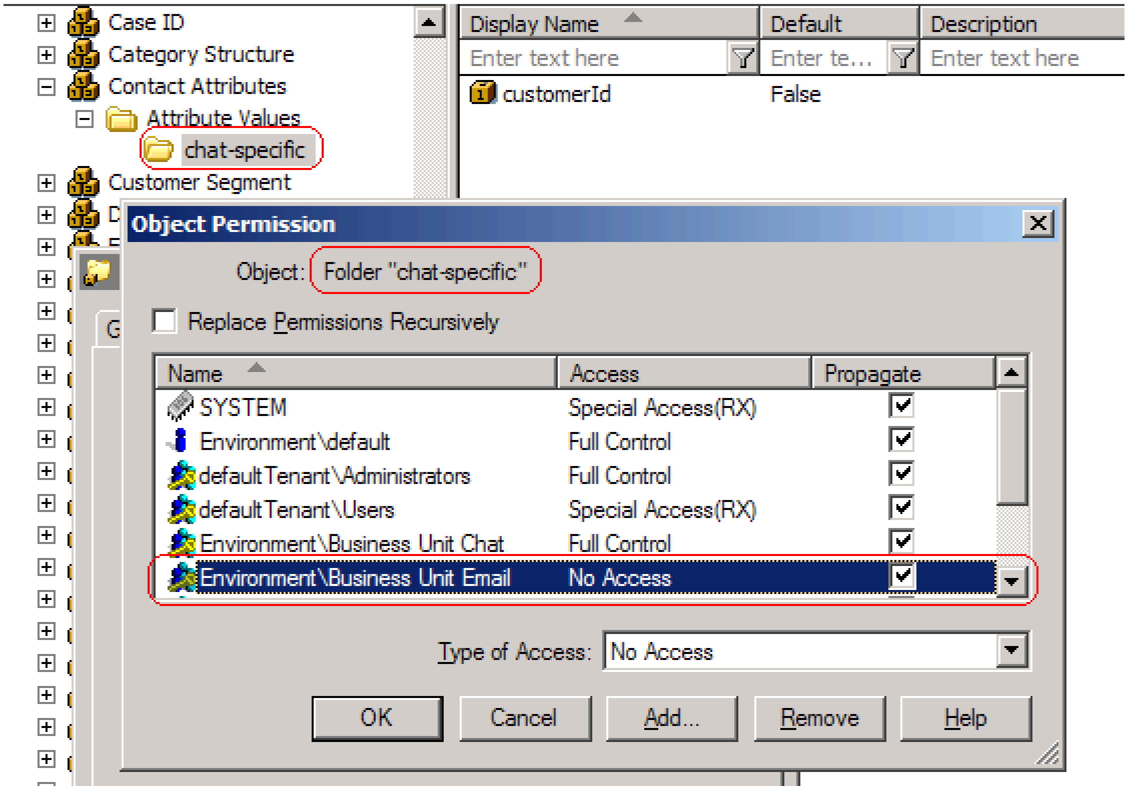
Figure 6: LOB-Specific Contact Attributes

The e-mail UCS will now behave as if `customerId` does not exist.

Important

Genesys recommends doing this before starting the e-mail UCS, to keep attribute metadata from being prematurely propagated.

6. To avoid having to perform the task in the previous step multiple times, you can group attributes in a folder and set permissions on the folder, as shown in the figure below. #:When an attribute is moved to the folder, it inherits the permissions.



Display Name	Default	Description
customerId	False	

Object Permission

Object: Folder "chat-specific"

☐ Replace Permissions Recursively

Name	Access	Propagate
SYSTEM	Special Access(RX)	☑
Environment\default	Full Control	☑
defaultTenant\Administrators	Full Control	☑
defaultTenant\Users	Special Access(RX)	☑
Environment\Business Unit Chat	Full Control	☑
Environment\Business Unit Email	No Access	☑

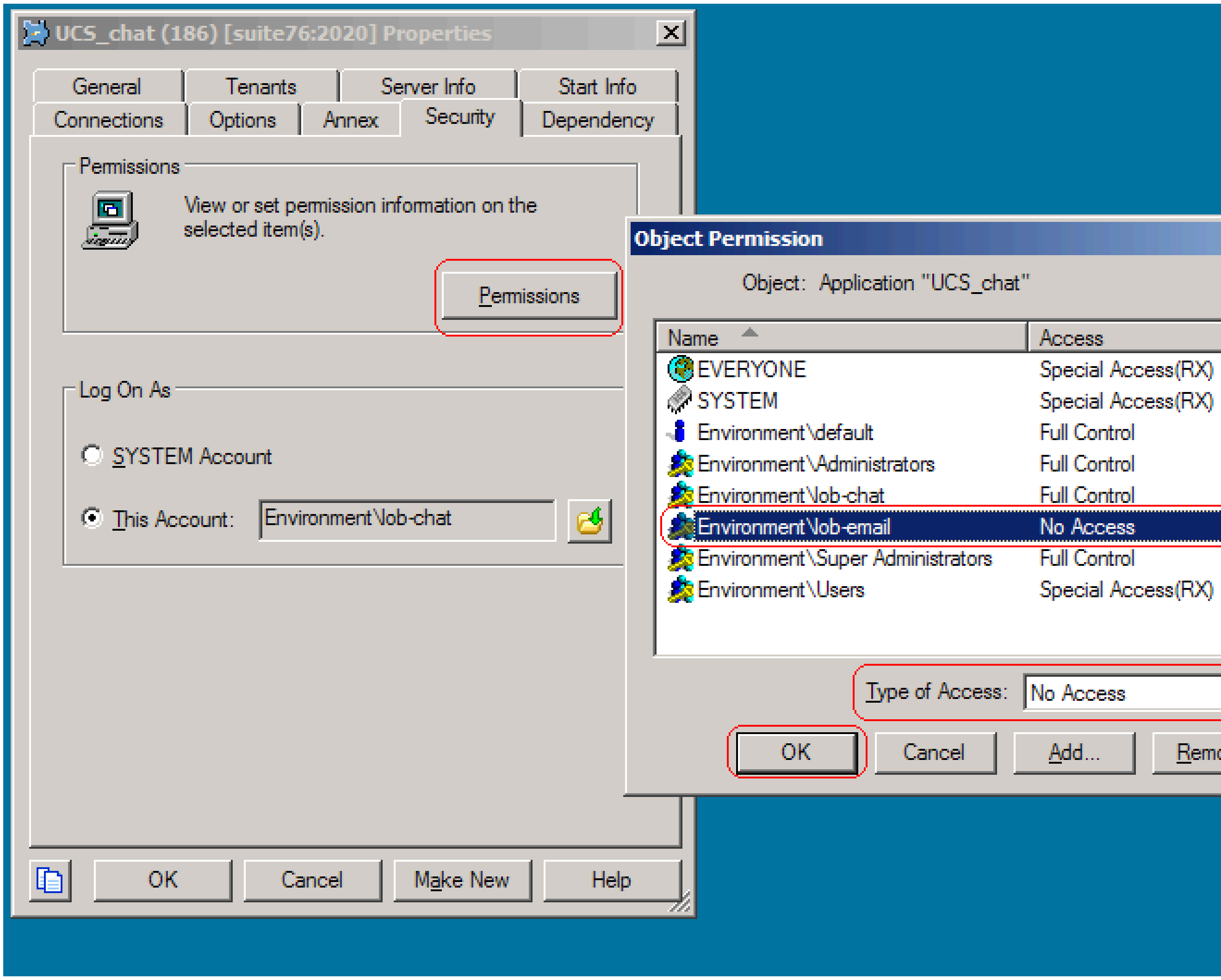
Type of Access: No Access

Figure 7: Chat-Specific Contact Attributes

7. Further configuration of UCS Application objects.

> ### Important
> Both Primary and Backup UCS must have the same configuration options and permission settings.

1. Set `No Access` permissions on the UCS application for all LOBs other than the one that this UCS is dedicated to. These permissions will be copied to all new objects created by this UCS in the Configuration Server database.



UCS_chat (186) [suite76:2020] Properties

○ SYSTEM Account

● This Account: Environment\lob-chat

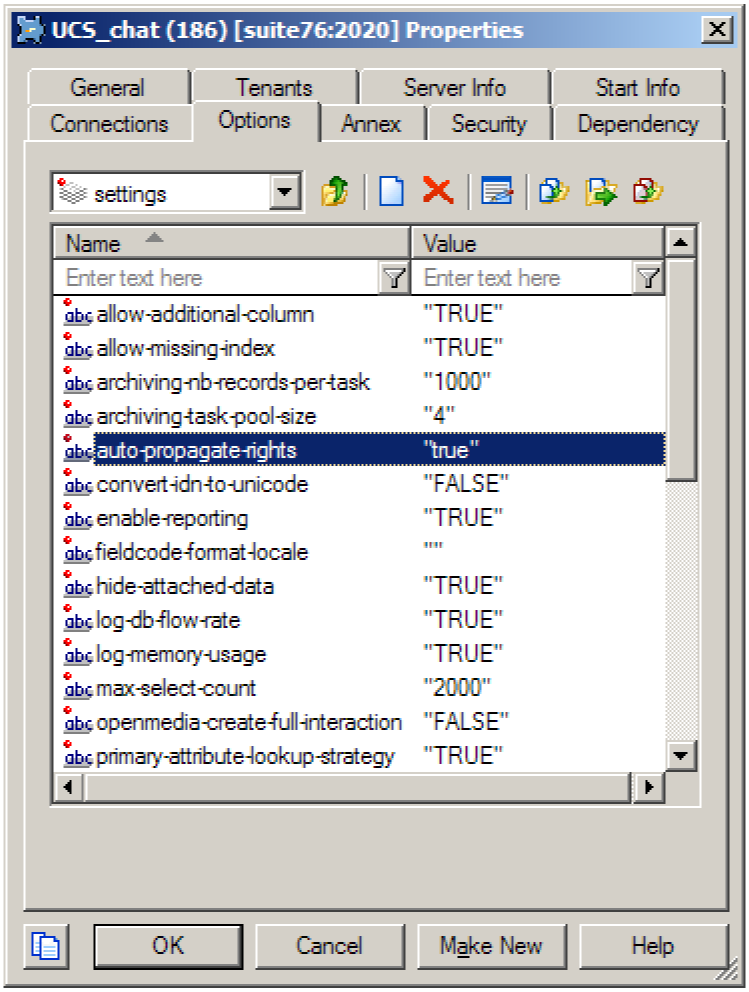
Object: Application "UCS_chat"

Name	Access
EVERYONE	Special Access(RX)
SYSTEM	Special Access(RX)
Environment\default	Full Control
Environment\Administrators	Full Control
Environment\lob-chat	Full Control
Environment\lob-email	No Access
Environment\Super Administrators	Full Control
Environment\Users	Special Access(RX)

Type of Access: No Access

Figure 8: UCS Application Permissions

2. In the UCS `settings` section, set the `auto-propagate-rights` option to `true`.



Name	Value
Enter text here	Enter text here
allow-additional-column	"TRUE"
allow-missing-index	"TRUE"
archiving-nb-records-per-task	"1000"
archiving-task-pool-size	"4"
auto-propagate-rights	"true"
convert-idn-to-unicode	"FALSE"
enable-reporting	"TRUE"
fieldcode-format-locale	""
hide-attached-data	"TRUE"
log-db-flow-rate	"TRUE"
log-memory-usage	"TRUE"
max-select-count	"2000"
openmedia-create-full-interaction	"FALSE"
primary-attribute-lookup-strategy	"TRUE"

Figure 9: UCS Options

From this point on, any new root category (as well as child categories or standard response) and screening rules will inherit the access permissions of the UCS application that created them.

Adjustments

This section describes some adjustments that may be required for Knowledge Manager objects (categories, standard responses, field codes, screening rules, training objects, and models).

Migration

If Knowledge Manager objects already exist in the Configuration Server database, you must use the following migration procedure:

1. Back up the UCS and Configuration Server databases.
2. Use Knowledge Manager to export all objects for each LOB to a file. Importing and exporting is described in "Importing and Exporting" in the "Knowledge Management: Basics" chapter of the

eServices User's Guide.

3. Use Knowledge Manager to delete all Knowledge Manager objects for each LOB.
4. Check that all Knowledge Manager objects have been removed from the Configuration Server database.
5. Upgrade all UCS database instances and specify permissions as outlined in Configuration Procedure.
6. Use Knowledge Manager to import all objects for each LOB, being sure to not select the option to generate new IDs for any LOB that previously synchronized with the Configuration Server database (since these IDs may already be used in strategies).
7. Wait for Knowledge Manager data to be synchronized.

Categories, standard responses, and field codes can have the same names in both LOBs, but not the same IDs. However, root categories and screening rules must have different names. IDs of these objects must be different as they are used as Configuration Server database object names.

Copying Knowledge Manager Data from One LOB to Another

Copying Knowledge Manager objects from one LOB to another can give rise to an issue with duplicated IDs. To avoid this you must rename the root category. This cannot be done in Knowledge Manager; instead you must manually edit the exported file, as in the following procedure. To copy Knowledge Manager data from one LOB to another:

1. Back up the UCS and Configuration Server databases.
2. Ensure that the target UCS is not able to write to the Configuration Server database.
3. Export the desired Knowledge Manager objects from the source UCS.
4. Rename the exported `.kme` file to a `.zip` file and extract the content, preserving the folder structure.
5. Open the `category-sre` folder and rename the folders that it contains. These folders are the root categories.
6. Compress the `category-sre, field-codes and screening-rules` files back to `.zip` files.
7. Rename the `.zip` file to `.kme` file.
8. Import the data into the target UCS, being sure to select `Preserve uniqueness of objects by creation of new UCS IDs.`
9. If you imported screening rules, you must now rename them.
10. Stop UCS, then set options and access rights as described in Configuration Procedure.
11. Start UCS and wait for Knowledge Manager to be synchronized to the Configuration Server database.

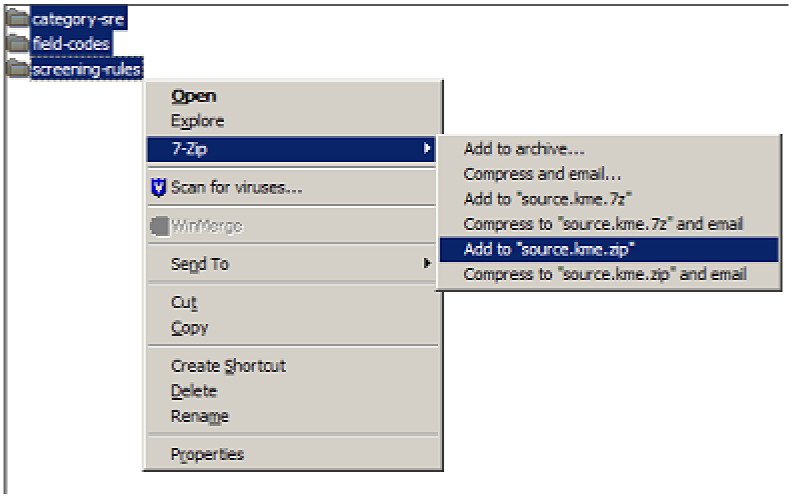


Figure 10: Knowledge Manager Folders Must be at the Root of the Zip File

Use with Other Genesys Applications

Access groups offer a generic ability to restrict access by other Genesys applications to the Configuration Server database. Consider, for example, Interaction Routing Designer (IRD). If IRD uses the default `system` account for logging into the Configuration Server database, it will have access to categories and screening rules for all LOBs. In this situation the strategy developer must keep track of which objects belong to which LOB. Otherwise, he or she runs the risk of creating strategies that request rendering of a standard response that does not exist in that UCS. This is why Genesys has recommended the use of a LOB-specific naming convention on root categories and screening rules. However, if IRD logs in using the `lob-email-user` account, it will only have access to objects relevant to the email LOB.

Limitations

- If IRD does not log in with a limited user, it will have access to standard responses that belong to other UCS, which makes it easy to create invalid strategies, as described in the preceding section.
- It is preferable to use one Universal Routing Server and one Interaction Server per business unit in order to prevent interactions from switching from one LOB to another.
- The solution described here makes it difficult to have multiple users to manage different objects in the Configuration Server database, such as when there is one user account per real person. It is preferable to have exactly one account for each LOB.
- All UCS instances access the same Business Attributes. This makes it difficult to define different Contact Attributes, Interaction Attributes, Media, Languages, and so on in different UCS instances. The only solution is to manually apply the access limitation to each created object.
- Applications (whether desktops or servers) that are not connected to Configuration Server using limited user(s) will see standard responses that are not usable by connected UCS instances. While Genesys applications can be configured to prevent this, that configuration must be done manually. It is preferable to use UCS as source for standard response titles anyway.

Load Balancing for a Single Context Server Database

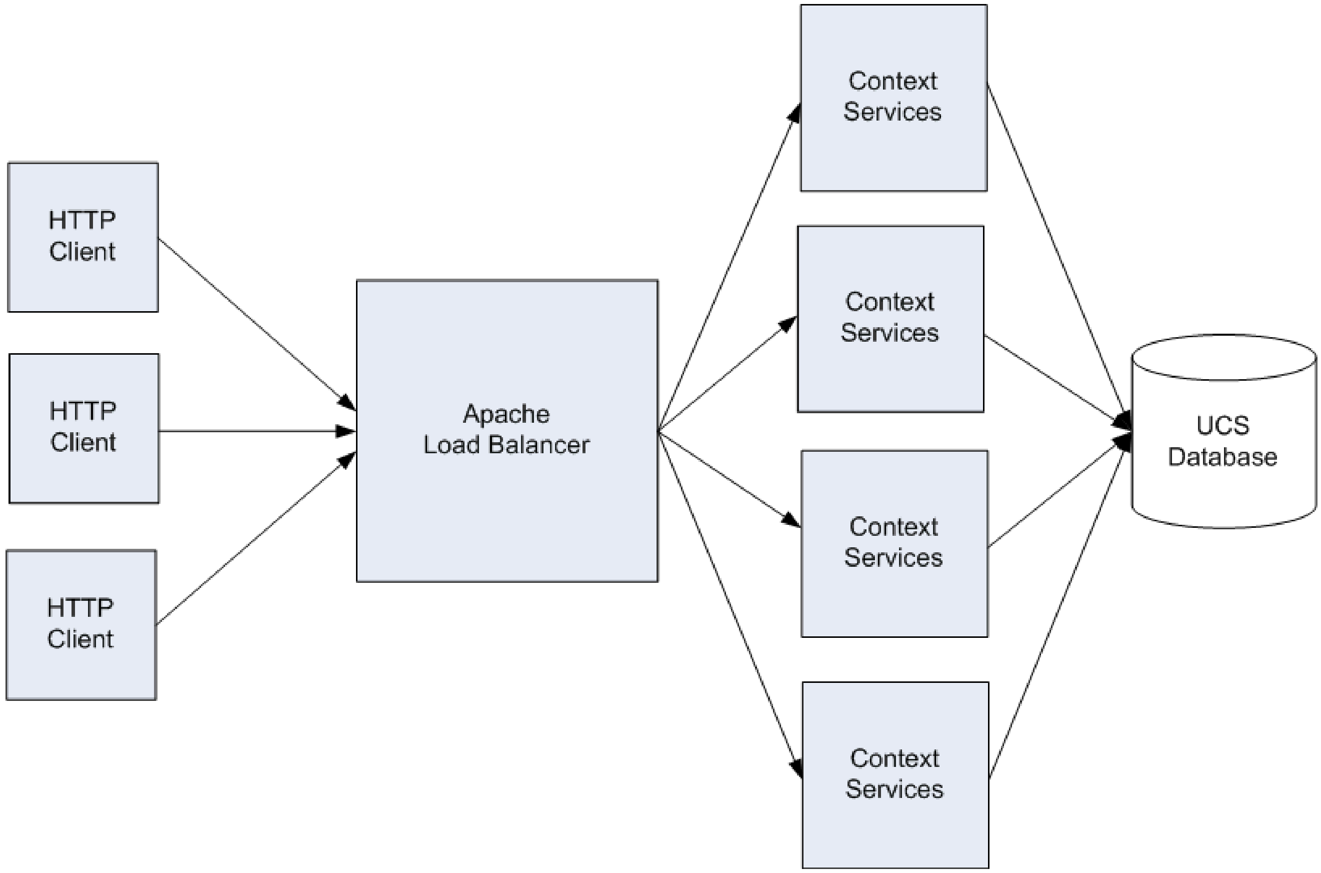
	Purpose: To configure Apache HTTP load balancing for the UCS database.

Overview

This solution describes how to have several Context Services to a single UCS database. The requests to Context Services are balanced between the servers using the Apache HTTP load balancing server. This type of configuration is beneficial for those environments experiencing high traffic to the Context Services server by providing high availability or redirecting requests to another site based on bandwidth consumption.

Architecture

The following diagram illustrates load balancing for Context Services.



Configuration

UCS/Context Services Configuration

The UCS application must be configured to run in Context Services mode. All other services must be disabled in the Configuration Server.

Apache HTTP Server Configuration

The Apache HTTP server uses the mod_proxy module for load balancing configuration. This mod_proxy module is directly maintained by Apache and allows more features for better performance compared to other modules (for example, mod_jk). The Apache server must load the modules. Requests to Context Services are forwarded to a cluster member, depending on the load factor. If the cluster member fails, requests are sent to the hot standby members. Apache see these members as hot stand-by; however, the Genesys configuration has them configured as Primary.

The mod_proxy module uses the `lbmethod` load balancing scheduler. It has three algorithms:

- `byrequests>`—performs weighted request counting.

- `bytraffic`—performs weighted traffic byte count balancing.
- `bybusyness` (Apache HTTP Server 2.2.10 and later)—performs pending request balancing.<br>

The default configuration uses the `byrequests` algorithm. For more information, see the Apache documentation for mod_proxy.

Limitation

If the schema changes after creating the extension on one Context Services server instance, you must refresh other instances internal caches by calling the /metadata/cache URI.

Configure Context Services

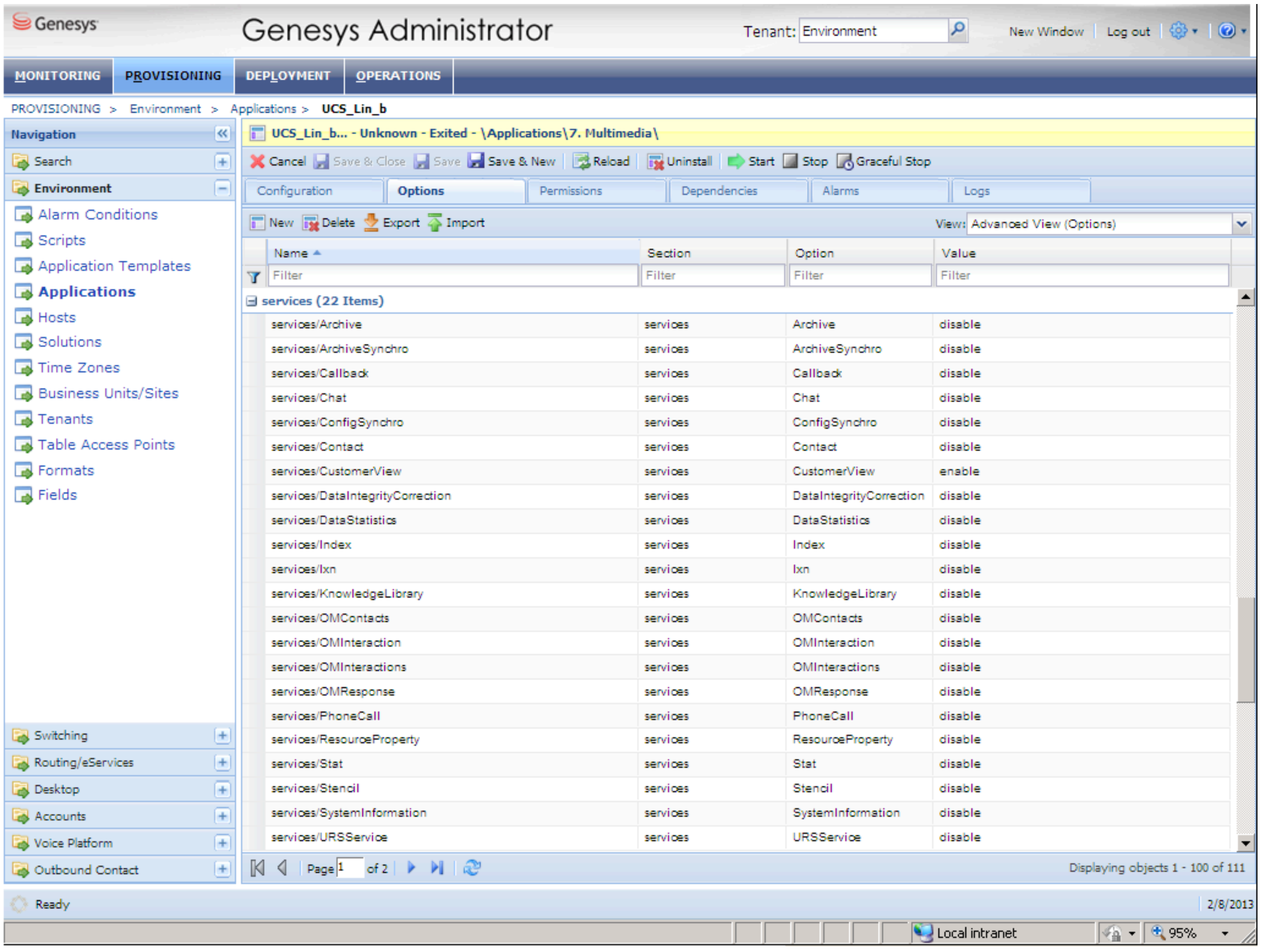
Purpose: To configure Context Services in the Configuration Layer.

Procedure

1. To disable the other services, set the following parameters in the `services` section of the `Options` tab of the Context Services UCS application:

```
SystemInformation=DISABLE
 CustomerView=ENABLE
 ConfigSynchro=DISABLE
 Contact=DISABLE
 OMContacts=DISABLE
 Archive=DISABLE
 ArchiveSynchro=DISABLE
 Callback=DISABLE
 Chat=DISABLE
 DataIntegrityCorrection=DISABLE
 DataStatistics=DISABLE
 Index=DISABLE
 Ixn=DISABLE
 KnowledgeLibrary=DISABLE
 OMInteraction=DISABLE
 OMInteractions=DISABLE
 OMResponse=DISABLE
 PhoneCall=DISABLE
 ResourceProperty=DISABLE
 Stat=DISABLE
 Stencil=DISABLE
 URSService=DISABLE
```

The following screen shot displays this configuration in Genesys Administrator.



services (22 Items)

Name	Section	Option	Value
services/Archive	services	Archive	disable
services/ArchiveSynchro	services	ArchiveSynchro	disable
services/Callback	services	Callback	disable
services/Chat	services	Chat	disable
services/ConfigSynchro	services	ConfigSynchro	disable
services/Contact	services	Contact	disable
services/CustomerView	services	CustomerView	enable
services/DataIntegrityCorrection	services	DataIntegrityCorrection	disable
services/DataStatistics	services	DataStatistics	disable
services/Index	services	Index	disable
services/Ixn	services	Ixn	disable
services/KnowledgeLibrary	services	KnowledgeLibrary	disable
services/OMContacts	services	OMContacts	disable
services/OMInteraction	services	OMInteraction	disable
services/OMInteractions	services	OMInteractions	disable
services/OMResponse	services	OMResponse	disable
services/PhoneCall	services	PhoneCall	disable
services/ResourceProperty	services	ResourceProperty	disable
services/Stat	services	Stat	disable
services/Stencil	services	Stencil	disable
services/SystemInformation	services	SystemInformation	disable
services/URSService	services	URSService	disable

Note: `CustomerView` is the only enabled parameter.

2. To disable Remote Method Invocation (RMI), set the `enable-rmi` parameter in the `settings` section on the `Options` tab of the of the Context Services UCS application to `false`.

3. To assign the RMI port, set the `ucsapi` parameter in the `ports` section on the `Options` tab of the Context Services UCS application to a correct port number. For example, `7550`.
   Note: Even if RMI is not used, this port number must be assigned.

Multiple Context Services on a Single Database

When configuring multiple Context Services on the same database:

1. Start one Context Services with the option `ConfigSynchro` set to ENABLE and all other options set to `DISABLE`.

2. Configure all other Context Services instances as described previously, with the listed options set to `DISABLE`.

When in the customizing phase, you may have to change the configuration of the core Profile attributes in the Configuration Layer. In this case:

- One (and only one) instance must have the option `ConfigSynchro` set to `ENABLE.` Use this instance to update Profiles or Services metadata.
- After each change, reload the cache on each of other instances using /metadata/cache URI.

Configure the Apache Server

Purpose: To configure Apache HTTP load balancing for the UCS database.

Procedure

Start

1. In the `<path to Apache>\conf\httpd.conf` file, configure the Apache capacity:

   ```
   <IfModule mpm_winnt_module>
      ThreadsPerChild      3350
      ThreadLimit 4000
      MaxRequestsPerChild    0
    </IfModule>
   ```

   Note: The module `mpm_winnt_module` is available for Windows only. For more information on the `mpm_winnt_module` or other modules for Unix/Linux, see your Apache's documentation.

2. In the `<path to Apache>>\conf\httpd.conf` file, enable (uncomment) the following lines:

   ```
   LoadModule proxy_http_module /usr/lib/apache2/modules/mod_proxy_http.so
    LoadModule proxy_module /usr/lib/apache2/modules/mod_proxy.so
    LoadModule proxy_balancer_module /usr/lib/apache2/modules/mod_proxy_balancer.so
    LoadModule proxy_ajp_module /usr/lib/apache2/modules/mod_proxy_ajp.so
    LoadModule jk_module /usr/lib/apache2/modules/mod_jk.so
   ```

3. At the end of the `<path to Apache>\conf\httpd.conf` file, specify the path to mod_proxy.conf: include `"<path to Apache>\conf\mod_proxy.conf"`

4. In the `<path to Apache>\conf\mod_proxy.conf` file, enter the following:

   ```
   <Location /someUrl/>
     # Turn on Proxy status reporting at /status
     # This should be better protected than: Allow from all
     ProxyStatus On
    <Location /status>
      SetHandler server-status
      Order Deny,Allow
      Allow from all
    </Location>
    ######### Proxy HTTP #########
    ProxyPass /cs/ balancer://cscluster/
    <Proxy balancer://cscluster>
    BalancerMember http://Context Services Server1:8182 loadfactor=1
    BalancerMember http://Context Services Server2:8485 loadfactor=1
    BalancerMember http://Context Services Server3:8283 status=+H
    BalancerMember http://Context Services Server4:8384 status=+H
    # status 'H' is hot standby
    ProxySet lbmethod=byrequests
    </Proxy>
   ```

```
</Location>
```

Note: Replace the above server names with your environment server values.

End

UCS and Conversation Manager

Purpose

Provides general descriptions of the Conversation Manager solution and the role that Universal Contact Server (UCS) plays within it. Contrasts UCS/CS with classic UCS.

Conversation Manager

Genesys Conversation Manager takes Genesys' core capability of routing and extends it, generalizes it, and integrates it more tightly with other Genesys products. Rather than the call (T-Server) or the interaction (eServices/Multimedia), Conversation Manager takes the service as the basic entity. It orchestrates the service process across channels and over time, using dynamic data and business rules to make decisions about operations. For example,

A bank customer calls a toll-free number inquiring about mortgage preapproval. An IVR prompts him to enter his account number, then transfers him to an agent, who fills in an application form for him and asks him to fax some supporting documents. After he faxes the documents, he receives an SMS message thanking him and informing him that he will receive a response within 48 hours. The next day he receives an e-mail congratulating him on the approval of his application.

This example involves voice, IVR, fax, SMS, and e-mail channels. Conversation Manager is able to treat the entire sequence as a single service.

Orchestration Server

Orchestration Server has a function in Conversation Manager similar to the function of Universal Routing Server (URS) in Genesys voice and multimedia solutions. One of the main differences is that it operates based on business processes developed in State Chart XML (SCXML) rather than routing strategies written in IRL (Intelligent Routing Language, a Genesys proprietary language).

SCXML applications

SCXML applications can be written directly using any XML or plain text editor, or with Genesys Composer, an Eclipse-based development environment. They are published on an application server such as JBoss or another Java-based application server, and are executed on Orchestration Server.

Genesys Composer

Composer also provides a set of function blocks that allow access to Context Services. These out-of-the box function blocks on the workflow diagram palette allow the developer to create applications that perform various actions, such as:

- Identify customers and update their profiles.
- Extend customer profiles with user-defined information.
- Query a customer's profile.
- Create, start, complete, and query customer services.

- Query customers' active services.
- Enter, complete, and query service states.

Service

Conversation Manager adds to Genesys the concept of service, which may be defined as follows:

- It represents a business process, which in turn may be seen as a communication or series of communications between a customer and an enterprise, and possibly also between various parts of the enterprise.
- It can span multiple interactions.
- It may include interactions in various media.
- It has a temporal beginning and end.
- It may be subdivided into states, which in turn may be subdivided into tasks (see also the diagram in Service Basics).

file:important.png This term *state* does not have the same meaning as "SCXML state."

Architecture

file: ConvMgrArchitec.jpg

UCS in eServices and Conversation

This page contrasts the role of UCS in eServices with its role in Conversation Manager

In eServices (Multimedia)

Genesys eServices (called Multimedia before release 8.0.1) is a cover term for Genesys components that work together to manage interactions whose media is something other than traditional telephonic voice (for example, e-mail or chat). eServices includes some parts of the Genesys Customer Interaction Management (CIM) Platform, plus certain of the media channels that run on top of the Platform. UCS's function in eServices is to store and manage the following:

- Contact data
- Interaction data
  - The body of an interaction (plus associated metadata and user data) while it is being processed
  - The history of an interaction, including its place (if any) in a thread.
- Knowledge Management data: category systems, screening rules, standard responses, training objects, and models (training objects and models are available only with the Content Analyzer option).

In the context of eServices, clients communicate with UCS using RMI (Remote Method Invocation) and ESP (External Service Protocol, a Genesys protocol). For more details see the Preface and the "Overview" chapter in the *eServices 8.0 Deployment Guide.*

In Conversation Manager

Central to Conversation Manager is the ability to maintain a unified view of the customer. Conversation Manager can use this knowledge in areas such as service personalization, enablement of service continuity, and in upsell/cross-sell campaigns. Context Services is the name of a group of additional capabilities that UCS provides. These capabilities can be invoked by any client, but most prominently by the components of the Conversation Manager solution. The Context Services functioning of UCS differs from its functioning in eServices in the following ways:

- In addition to interaction data and contact data (called customer data in the Context Services context), UCS/CS stores data on services. Services are the basic units in a model for business context used in customer service applications. See also Service Basics.
- Clients communicate with UCS/CS using RESTful (HTTP) web services, not RMI or ESP.
- Context Services uses a different procedure for contact identification and creation.
- Context Services organizes data on contacts differently. See Profile Basics.

UCS with Context Services

Purpose

Provides a general description of how UCS works.

Archiving and Pruning the DB

Purpose: This page describes maintenance of the UCS database.

Overview

To prevent your UCS database from expanding to an unmanageable size, you may wish to perform archiving and pruning.

- Archiving is the process of removing selected threads from the main database and storing them in the archive database.
- Pruning (sometimes also called purging) is the process of removing threads from either the main or the archive database.
- Maintenance is a cover term for pruning and archiving.

For both archiving and pruning you have a choice of two processes, as laid out in the following table.

Comparison of Maintenance Processes

Process	Configuration options (section/ option)	Speed	Complexity	Availability	Objects accessible
UCS Manager archiving	`cview/enabled = false`	Slower	Simple, can stop midway	All releases of UCS	Interactions only
UCS Manager pruning	`cview/enabled = false`	Slower	Simple, can stop midway	All releases of UCS	All

Set-based archiving	`cview/enabled = true`
	`archiving/use-np = true`
		Very fast	Several steps, cannot stop midway	UCS 8.0.2 and later	Interactions only

Prune using options	`cview/enabled = true`	Fast	Cannot stop midway	UCS 8.1.0 and later	All

Using UCS Manager Only

For all releases of UCS, you can use UCS Manager to configure and run the complete process of maintaining the UCS database, as described in the online Help that is delivered with UCS Manager. UCS Manager can also:

1. correct certain problems that may exist with data integrity, and

2. display statistics about the UCS database.

Set-Based Archiving

Beginning with release 8.0.2 of UCS, you can also use set-based archiving. One way to characterize the difference between the new set-based archiving and the existing archiving via UCS Manager only is that the former moves data table by table while the latter moves it interaction by interaction. Set-based archiving requires expertise in database management. Therefore it should be performed only by a qualified database administrator.

Prerequisites

Disk Space

Set-based archiving requires temporary space in the main database constituting about 90% of the space occupied by the archivable interactions. For example, if one million interactions, including 350,000 attachments, take up 10.2 GB in the main database, the temporary space needed is 9 GB.

User rights

UCS must create and drop tables during the archiving process. These rights must be granted to the UCS user in the main DB during the archiving process. Once this process is completed these rights can be revoked for normal operation of UCS. Consult your RDBMS documentation for directions on granting and revoking these rights.

The user will have to execute special queries to transfer data from temporary table to archive DB. These queries are particular to MS SQL Server and Oracle.

For Oracle, the user must be able to create and drop database links using the following queries:

```
create database link arch using 'ucsarch';
```

```
drop database link arch;
```

For MS SQL Server, the user must be able to execute the following stored procedure:

```
EXEC sp_addlinkedserver @server = N'suite801',
@srvproduct=N'SQL Server'
```

```
EXEC sp_dropserver 'suite801', null;
```

The queries presented here describe the minimum needed to create the database link between the main and archive UCS databases. Depending on the configuration of your database, you may need to pass more parameters, such as `usernames`, `password`, `schemas`, `tablespaces`, and so on. Consult your RDBMS documentation for guidance.

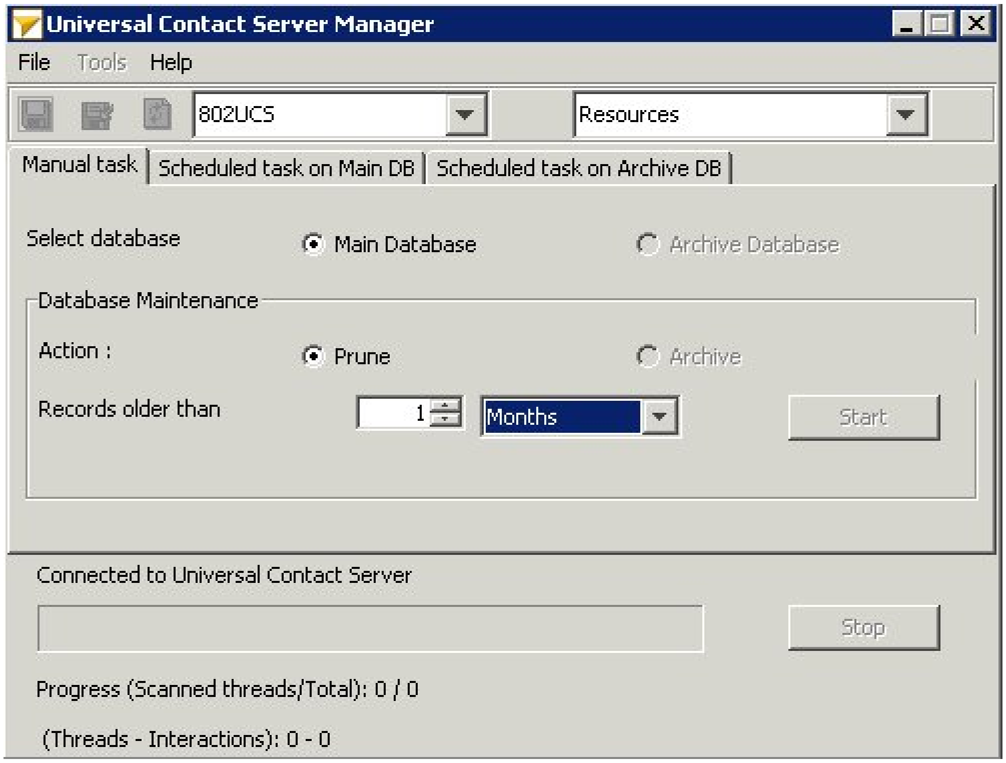
Configuration

Open your UCS Application object and:

- In the `cview` section, set the `enabled` option to `true`.
- Create a section called `archiving`. In it create an option called `use-np` with the value `true`.

Start the Archiving from UCS Manager

1. Open UCS Manager.


Universal Contact Server Manager
File
Tools
Help
Manual task
Scheduled task on Main DB
Scheduled task on Archive DB
Database Maintenance
Start
Stop

802UCS

Resources

Select database ● Main Database ○ Archive Database

Action : ● Prune ○ Archive

Records older than 1 Months

Connected to Universal Contact Server

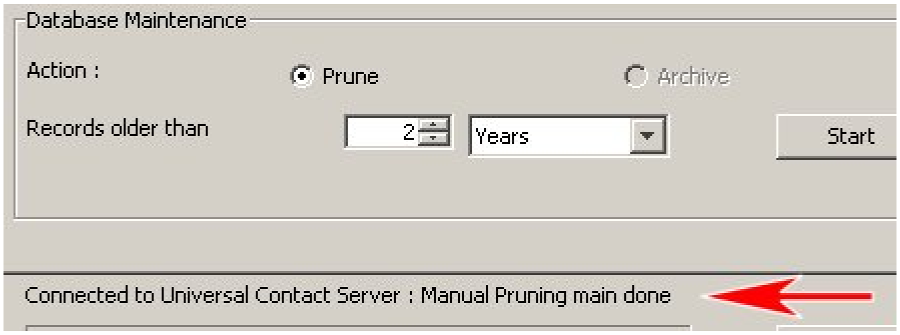
Progress (Scanned threads/Total): 0 / 0

(Threads - Interactions): 0 - 0

2. Select one of the following tabs:
   - `Manual task` for performing one-time maintenance
   - `Scheduled task on Main DB` for scheduling periodic maintenance on the main database
   - `Scheduled task on Archive DB` for scheduling periodic maintenance on the archive database

   If you select either of the scheduled tasks, you must also be able to schedule the execution of the SQL queries described lower down on this page.

3. Click Start.
4. When UCS Manager displays `<task> <database> done,` in the area indicated by the red arrow in the screenshot below,
   - For pruning, stop here.
   - For archiving, proceed to the next section below.



Database Maintenance

Action : ● Prune ○ Archive

Records older than 2 Years

Connected to Universal Contact Server : Manual Pruning main done

Continue The Process

Continue by issuing the SQL queries described for the two supported RDBMs on these pages:

- Oracle databases
- MicroSoft SQL databases

Failure Recovery

The steps to recover from a failure depend on whether the failure occurred during the archiving process, or when data was being moved. Both possibilities are described below. **Failure During Archiving** If a failure occurs during archiving, the archiving process must be restarted from the beginning. To do so,

1. Stop UCS Manager and UCS.
2. Execute the following queries:

```
drop table docid_temp;
drop table ixnid_temp;
drop table interaction_arch;
drop table emailin_arch;
drop table emailout_arch;
drop table phonecall_arch;
drop table callback_arch;
drop table cobrowseurl_arch;
drop table chat_arch;
drop table attachment_arch;
drop table ixncontent_arch;
drop table ixnContentSentReceived_arch;
drop table document_arch;
```

3. Restart both UCS Manager and UCS, and restart the archiving process.

Failure During Data Movement If a failure occurs during data movement, roll back all movement operations. The archiving procedure does not need to be executed again. Just restart the "Transferring Data into UCS DB Archive" procedure, described here for Oracle and here for MS SQL.

Multiple Attachment of a Single Document

In order to save space, UCS re-uses the same document object in the database if it is attached multiple times to an interaction. This is, for example, the case when using Standard Responses with attachments, either for agent use or for automatic replies. Like archiving using UCS Manager alone, set-based archiving does not remove unused documents from the main database because it would require an SQL operation that could take several hours to execute on large databases. For the same reason, the archiving mechanism cannot check if a document has already been inserted into the archive database. If a certain document is used multiple times, insertion of the document object in the archive database will fail with a Primary Key Constraint Violation during the execution of the following query: Oracle:

```
insert into document@arch select * from document_arch;
```

Microsoft SQL Server:

```
insert into bsgenucsdb.UCSArch.dbo.document select * from document_arch;
```

There are two possible workarounds:

- Skip this operation and avoid copying documents into the archive database.
- Use database-specific commands to merge the data into the archive database. Consult your database documentation for instructions on executing this operation.

Limitations

Set-based archiving has the following limitations:

- DB2 is not supported.
- The progress indicators in UCS Manager do not function.
- As with archiving using UCS Manager only, set-based archiving does not remove documents from the main database. Use UCS Manager's Data Integrity Correction tool to remove the orphan documents.
- If you stop the archiving from UCS Manager, processing will stop only when the current operation is finished. Depending on the size of the database, this can take from minutes to hours.
- If you stop the archiving process, you must restart the process from the beginning, first ensuring that no temporary tables are left (see Failure During Archiving). Unlike the existing archiving using UCS Manager only, set-based archiving does not support resuming the process from the point that it stopped.
- If an error occurs at any level during archiving process, you must restart the process from the beginning, first removing any temporary tables.
- You must ensure that enough space is available in the main database before starting the process. If there is insufficient space the process will fail and must be started over.
- Pruning is supported on the main database only, not on the archive database.

Using Configuration Options to Schedule Service Pruning

Starting in release 8.1.0, you can use configuration options to schedule pruning (purging) of service records. It is not possible to use UCS Manager for these operations.

1. On the `Annexes` tab of your UCS application, create one or more sections called `scheduled-job-XX`, where *XX* is any convenient identifier.
2. Create options and assign values to them, as described in the table below.

If you have multiple `scheduled-job-XX sections`, be careful to keep the scheduled times (specified by the `cron-expression` option) separate. Only one purging operation can be executed at a given time: if one operation is not finished when a second one has been scheduled, the second one will not start at all.

Service Pruning Options

These are the options that may be added to a `scheduled-job-XX` section. You can create multiple `scheduled-job-XX` sections.

Service Pruning Options

Option Name	Default Value	Valid Values	Value Changes	Description
enabled	false	true, false	Take effect immediately	Enables (`false`) or disables (`true`) the effects of these purging options.
action	purge.service.closed	• purge.service.all • purge.service.open • purge.service.open.anonymous • purge.service.closed • purge.service.closed.anonymous	Take effect immediately	Specifies the type of action to be performed when the pruning process runs: • `purge.service.all`—Any started or completed services within the given time range are purged. • `purge.service.open.anonymous`—Only open anonymous services are purged from database. • `purge.service.open`—Only non-completed services are

Option Name	Default Value	Valid Values	Value Changes	Description
				purged from database. • `purge.service.closed'`—Only completed services are purged from database. • `purge.service.closed.anonymous'`—Only completed anonymous services are purged from database.
period	5	Any positive integer from 1 to 9999	Take effect immediately	Sets the time frame for pruning. For example, with settings of `period=6 and period-type=days`, the purging process deletes all services older than 6 days. See also the `period-type` option.
period-type	months	• hours • days • months • years	Take effect immediately	Specifies the units to use with the `period` option: • `hours`—Purge services older than n hours. • `days`—Purge services older than n days. • `months`(default)—Purge services older than n months. • `years`—Purge services older than n years. See the `period`

Option Name	Default Value	Valid Values	Value Changes	Description
				option.
cron-expression	0 0 20 ? * 6L	Any valid Cron expression, as described at Cron Expression	Take effect immediately	Specifies the schedule for pruning. The default value means that pruning takes place at 8 PM on the last Friday of the month; see the diagram in the following section. For additional documentation about Cron, see the Wikipedia entry.

Cron Example

Here is an analysis of the default value of the `cron-expression` option:

```
0    0   20    ?    *   6L     *   => Triggers at 8 PM on the last Friday of every month
┬    ┬    ┬    ┬    ┬    ┬     ┬
│    │    │    │    │    │     └── year (optional)
│    │    │    │    │    └──────── day of week (0 - 7) (Sunday=0 or 7)
│    │    │    │    └───────────── month (1 - 12)
│    │    │    └────────────────── day of month (1 - 31)
│    │    └─────────────────────── hour (0 - 23)
│    └──────────────────────────── min (0 - 59)
└───────────────────────────────── sec (0 - 59)
```

Contact Identification

Purpose: Provides a high-level description of Context Services method of identifying customers, and contrasts it with the way that UCS (without CS) does so.

If either method produces a unique match for the incoming customer data, there is of course no problem. The differences become relevant when there are multiple matches or when there is no match.

Multiple Matches Found

If UCS tries to identify a customer, and receives more than one match in return:

- In UCS, there are various possibilities depending on the entity that requested the identification. For example, UCS selects the first customer in the returned list if it is responding to E-mail Server. A description of all possible scenarios can be found in the "Contact Identification and Creation" chapter of the eServices 8.0 User's Guide.
- In UCS/CS, you define arbitrary identification keys (such as e-mail address, last_name + first_name, and so on). If you attempt to identify by e-mail address, for example, and this maps to more than one customer, the application receives complete profiles for all matched customers. This gives the application the opportunity to disambiguate.

For example, the SCXML application may send the matched profiles to the IVR, which might prompt for the customer's name (with the grammar formed by taking the names from the matched profiles). More generally, the application will prompt for additional information and use other identification keys to further isolate the customer's identity. Once a given identity is assumed, the application will often use additional information (such as the customer's ZIP code) to validate the customer's identity. In this sense, UCS/ allows for the application to distinguish between assumed and validated customer identities.

No Matches Found

- In UCS, if a customer is not found on lookup, a new contact record is created. Again, this may or may not be correct.
- In UCS/CS, the application again has the opportunity to collect additional information and attempt to identify the customer using some other identification key. In the end, the application or the agent may separately decide to create a new customer/contact profile, but the decision to do this is completely application-specific.

The preceding statements about how UCS (without Context Services) identifies and creates contacts apply only to the default behavior of UCS. The "Contact Identification and Creation" chapter of the eServices 8.0 User's Guide describes ways that you can customize this default behavior. However, what you can customize is limited to 1) the contact attributes that UCS checks and the order it checks them in, and 2) whether UCS creates a new contact in the event of no match, or if it does, a minimum set of attributes that must match. In neither case does it allow the application to expand the attributes that it checks, unlike UCS/CS.

Messaging, Modes, and Migration

Purpose: More on the basic operation of UCS

Messaging

Clients connect to UCS and send requests, to which UCS responds. Clients communicate with UCS via RESTful web services, using HTTP request methods that are based on the GET, POST, PUT, and DELETE methods. Clients of UCS/CS may include Orchestration Server, Genesys Voice Portal (GVP), agent desktops, or any third party application that makes use of real-time customer service information.

Modes

UCS has two modes of operation. Each message can be sent in only one mode.

- Production—The normal operating mode. UCS accepts incoming requests for querying/updating customer profiles and service-related data.
- Maintenance—For configuring the database and other operations; normally to be used only at times of low traffic. Use this mode to create extensions to the customer profile model, or to define identification keys. While in maintenance mode, the system does not process incoming requests for querying or updating customer profiles or service history.

Migration and Transition

For migration from versions 7.0 through 8.0.0 of UCS, see the *Genesys Migration Guide.* For versions previous to 7.0, there is no complete migration, but you can convert most of the UCS (then called Contact Server) database. The procedure is described in the "Transitioning to eServices from ICS 6.x" chapter in the *eServices 8.0 User's Guide.*

Using HTTPS

	Purpose: To configure UCS to use secure HTTPS connections.

Overview

This page describes using configiration options and the keytool utility to configure UCS to use secure HTTPS connections.

- Keytool is a key and certificate management utility included in JDK or JRE installations. For instance, when you install Java Environment and Libraries for eServices and UCS, keytool is placed in the `\jre\bin` directory.
- In release 8.1.0 and later, the options are located in new sections that you create on the Annex tab in Configuration Manager or the Advanced View (Annex) in Genesys Administrator.

Procedure

This procedure makes use of keytool, which is a key and certificate management utility included in JDK or JRE installations. For instance, when you install Java Environment and Libraries for eServices and UCS, keytool is placed in the `\jre\bin` directory.

1. Generate a key-pair for the certificate. The following is an example command line:

   ```
   keytool -genkey -v -alias hostname.example.com
    -dname "CN=hostname.example.com,OU=IT,O=ourcompany,C=FR" -keypass theKeyPassword
    -keystore certificate.jks -storepass theKeystorePassword -keyalg "RSA" -sigalg
    "SHA1withRSA"
    -keysize 2048 -validity 3650
   ```

2. Set configuration options in your UCS Application object.
   1. Go to the Advanced View (Annex) in Genesys Administrator or the Annex tab in Configuration Manager.
   2. Create sections called `http.tls.keystore and http.tls.key.`
   3. Add options to the new sections, as described in the HTTPS section of the Security and Authentication page.
3. Export the certificate from UCS. Following is an example command line:

   ```
   keytool -export -v -alias hostname.example.com -file certificate.cer
    -keystore certificate.jks -storepass theKeystorePassword
   ```

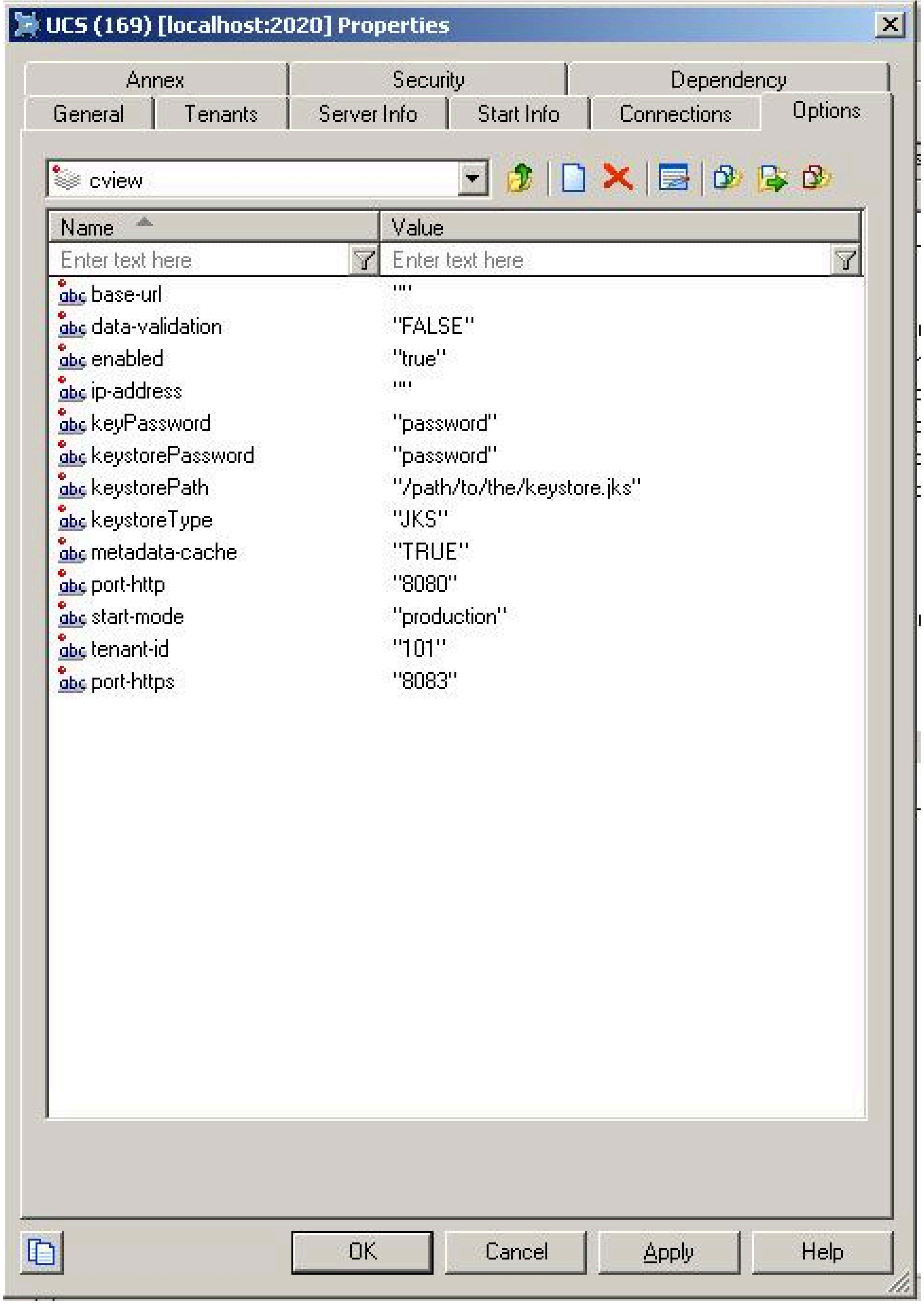
4. Import the certificate on all clients of UCS. Following is an example command line:

   ```
   keytool -import -alias hostname.example.com -file certificate.cer
   ```

```
    -keystore .keystore -storepass anotherPassword
```

Example

This screenshot shows UCS configured to listen on both HTTP and HTTPS ports.



Name	Value
base-url	""
data-validation	"FALSE"
enabled	"true"
ip-address	""
keyPassword	"password"
keystorePassword	"password"
keystorePath	"/path/to/the/keystore.jks"
keystoreType	"JKS"
metadata-cache	"TRUE"
port-http	"8080"
start-mode	"production"
tenant-id	"101"
port-https	"8083"

Profile Basics

	Purpose: Basic information on profiles

Description

UCS stores contact information in Profiles. Profile data is separated into the following types:

- *Core information* consists of one or more typed attributes, which are defined by a Schema.
- *Extensions* consist of one or more typed attributes. Users configure these as needed for their particular organization or customer service application.
- *Identification Keys* are an attribute or attributes that you specify as the way to identify a customer. These can be attributes of the core information or of associated extensions.

One of the primary features of the Context Services API is the ability to identify customers based on one or more attributes of the customer, known as Identification Keys. Each identification key consists of one or more attributes of the core customer profile, or of any defined extension. An attribute must be specified as an Identification Key to be usable in customer identification.

Service Basics

Purpose: Basic information on Services

UCS makes use of a model in which customers are associated with any number of Services. Services are composed of any number of States, and States can in turn be composed of any number of Tasks. This three-level structure provides a flexible vocabulary by which organizations store the history of the services that they provide to customers. A Service may also be divided directly into tasks: file:serviceStateTask.jpg Services are defined by association to Service Types that you create as Business Attributes in the Configuration Layer. States may be used to represent components of customer service, such as:

- Customer identification
- Assigning a service agent (automated or live)
- Service identification
- Waiting for a service agent
- Offering another service while waiting for an agent
- Offering callback
- Waiting for customer input

For more information on this point, see this page in the Context Services Developer's Guide. Services, States and Tasks exist over some application-defined lifecycle. Upon completion, applications may specify a Disposition. For example, the offering of a new product or service might be recorded as a State of type `Offer another service`. The Disposition might be set to show whether the customer accepted or declined the offer. Information on past declined or accepted offers could then be used to calculate the likelihood that the customer might be interested in the offer at some point in the future. **Note:** This Service Model can be used by any component that can access UCS/CS’s HTTP interface. It is not limited to use in Conversation Manager.

Set-based Archiving with MSSQL

Purpose: This page presents the SQL queries used for set-based maintenance of the UCS database on an MS SQL RDBMS.

Prerequisites

See Archiving and Pruning the DB for prerequisites. In particular, before using these queries you must first **run archiving from UCS Manager.**

Creating the Database Link

1. Be sure that the DNS name resolves properly to the archive database server. If not, you can add it to the host file; on Windows, for example, this is located at `C:\WINDOWS\system32\drivers\etc\hosts`.
2. To create the DB link execute the following command. Note that the command will return no error, even if a parameter is wrong or the destination host does not resolve correctly.

   ```
   EXEC sp_addlinkedserver @server = N'bsgenucsdbarch', @srvproduct=N'SQL Server'
   ```

   The queries presented here describe the minimum needed to create the database link between the main and archive UCS databases. Depending on the configuration of your database, you may need to pass more parameters, such as `usernames`, `password`, `schemas`, `tablespaces`, and so on. Consult your RDBMS documentation for guidance.
3. To test if creation was successful, execute the following command:

   ```
   select count(*) from bsgenucsdbarch.UCSARCH.dbo.interaction;
   ```

   In this example,

   - `bsgenucsdbarch` is the destination host.
   - `UCSARCH` is the database.
   - dbo is the schema.

   Edit these names to match your configuration. Do the same in the queries provided in Moving the Data to the Archive Database below.
4. To drop the link, execute the following command:

   ```
   EXEC sp_dropserver 'bsgenucsdbarch', null;
   ```

   The link can be kept permanently and will not affect UCS operations. But when the link is no longer used, you may wish to drop it for security concerns.

Moving the Data to the Archive Database

1. Use the following commands:

```
insert into bsgenucsdb.UCSArch.dbo.interaction select * from interaction_arch;
 insert into bsgenucsdb.UCSArch.dbo.emailin select * from emailin_arch;
 insert into bsgenucsdb.UCSArch.dbo.emailout select * from emailout_arch;
 insert into bsgenucsdb.UCSArch.dbo.phonecall select * from phonecall_arch;
 insert into bsgenucsdb.UCSArch.dbo.callback select * from callback_arch;
 insert into bsgenucsdb.UCSArch.dbo.chat select * from chat_arch;
 insert into bsgenucsdb.UCSArch.dbo.ixncontent select * from ixncontent_arch;
 insert into bsgenucsdb.UCSArch.dbo.ixnContentSentReceived select * from
 ixnContentSentReceived_arch;
 insert into bsgenucsdb.UCSArch.dbo.document select * from document_arch;
 insert into bsgenucsdb.UCSArch.dbo.cobrowseurl select * from cobrowseurl_arch;
 insert into bsgenucsdb.UCSArch.dbo.attachment select * from attachment_arch;
```

2. If the move is successful, the temporary tables can be dropped:

```
drop table interaction_arch;
 drop table emailin_arch;
 drop table emailout_arch;
 drop table phonecall_arch;
 drop table callback_arch;
 drop table cobrowseurl_arch;
 drop table chat_arch;
 drop table attachment_arch;
 drop table ixncontent_arch;
 drop table ixnContentSentReceived_arch;
 drop table document_arch;
```

End

Archiving is now complete. Return to Archiving and Pruning the DB for descriptions of limitations and failure recovery methods.

Set-based Archiving with Oracle

Purpose: This page presents the SQL queries used for set-based maintenance of the UCS database on an Oracle RDBMS.

Prerequisites

See Archiving and Pruning the DB for prerequisites. In particular, before using these queries you must first **run archiving from UCS Manager.**

Creating the Database Link

1. The `tnsname.ora` file must refer to the destination database host in order to enable database link creation. The file must do this even if the destination database is on the same server as the main database. Below is an example `tnsname` file:

   ```
   # tnsnames.ora Network Configuration File: D:\app\Administrator\product\11.1.0\db_1\
   network\admin\tnsnames.ora
   # Generated by Oracle configuration tools.
   UCS =
     (DESCRIPTION =
       (ADDRESS = (PROTOCOL = TCP)(HOST = bsgenuscdb.emea.lucent.com)(PORT = 1521))
       (CONNECT_DATA =
         (SERVER = DEDICATED)
         (SERVICE_NAME = UCS)
       )
     )
   UCSARCH =
     (DESCRIPTION =
       (ADDRESS = (PROTOCOL = TCP)(HOST = bsgenuscdbarch.emea.lucent.com)(PORT = 1521))
       (CONNECT_DATA =
         (SERVER = DEDICATED)
         (SERVICE_NAME = UCSArch)
       )
     )
   ```

   In this example, the UCS entry is for the main database and UCSARCH is for the archive database. Note the following: (1) These names must match the names of the databases used. (2) Because is no need for a link from archive to main, you do not have to modify the `tnsnames.ora` on the archive database machine.

2. Ensure that the destination host is reachable from the main machine by pinging the destination host from the main machine.

3. Once the `tnsname` file is properly configured, the execution of the following SQL command will create the DB Link. Note that you will receive no error message even if the `tnsnames.ora` file or the parameters of `ucsarch` are incorrect.

   ```
   create database link arch using 'ucsarch';
   ```

Replace `ucsarch` with the name that you configured in the `tnsnames.ora` file. ⚠ The queries presented here describe the minimum needed to create the database link between the main and archive UCS databases. Depending on the configuration of your database, you may need to pass more parameters, such as `usernames, password, schemas, tablespaces,` and so on. Consult your RDBMS documentation for guidance.

4. To test the link, execute the following command, which lists the structure of the interaction table in the archive database:

   ```
   desc interaction@arch;
   ```

5. To drop the link, execute the following command:

   ```
   drop database link arch;
   ```

   Database links persist through restarts.

Moving the Data to the Archive Database

1. Use the following commands:

   ```
   create database link arch using 'ucsarch';
   insert into interaction@arch select * from interaction_arch;
   insert into emailin@arch select * from emailin_arch;
   insert into emailout@arch select * from emailout_arch;
   insert into phonecall@arch select * from phonecall_arch;
   insert into callback@arch select * from callback_arch;
   insert into chat@arch select * from chat_arch;
   insert into ixncontent@arch select * from ixncontent_arch;
   insert into ixnContentSentReceived@arch select * from ixnContentSentReceived_arch;
   insert into document@arch select * from document_arch;
   insert into cobrowseurl@arch select * from cobrowseurl_arch;
   insert into attachment@arch select * from attachment_arch;
   drop database link arch;
   ```

2. If the move is successful, the temporary tables can be dropped:

   ```
   drop table interaction_arch;
   drop table emailin_arch;
   drop table emailout_arch;
   drop table phonecall_arch;
   drop table callback_arch;
   drop table cobrowseurl_arch;
   drop table chat_arch;
   drop table attachment_arch;
   drop table ixncontent_arch;
   drop table ixnContentSentReceived_arch;
   drop table document_arch;
   ```

End

Archiving is now complete. Return to Archiving and Pruning the DB for descriptions of limitations and failure recovery methods.