An Overview of the SaskTel Hosted Contact Centre Solution Design and Delivery Principles, and Core Architecture

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The SaskTel Hosted Contact Centre Solution

The SaskTel Hosted Contact Centre (HCC) is designed from the ground up to deliver the first truly scalable customer service center that is also cost effective. Previously, companies seeking technology solutions to customer service automation challenges faced huge capital investments in software and hardware, long implementation times, expensive integration with existing systems, and high learning curves - during which time agent productivity plummeted.

Conceived as a single, out of the box service that fully integrates all customer communications channels - phone, email, and web - SaskTel HCC unifies customer contacts into one routing, queuing, and tracking system. It also delivers sophisticated customer contact and case management capabilities for storage, retrieval, and tracking of customer histories.

The unique architecture of the SaskTel HCC delivers an enterprise level solution that is fast to implement, efficient to maintain and support, and easy to use.

Benefits of the SaskTel HCC Architecture

Affordability

Unlike traditional Application Service Providers (ASP), SaskTel HCC does not require an expensive, dedicated hardware environment for each customer.

Quick to deploy

SaskTel HCC can be set up in minutes and is easy to maintain and support. This is a radical departure from traditional call centers, which require a multi-phased, 12-18 month implementation cycles, and usually the time and expense of a systems integrator.

Ease of use

Because it is a seamlessly integrated solution, SaskTel HCC is easy to learn and use. Agents simply familiarize themselves with one intuitive user interface, and they are ready to take service requests. With a traditional call center, agents lose productivity as they spend weeks or months learning numerous “integrated” applications, each with a different interface and use.

Design and delivery principles

Engineered from the start for maximum maintainability and cost effectiveness, SaskTel HCC currently scales to thousands of agents per hosted platform. SaskTel HCC can add agents quickly, without the need for any additional hardware infrastructure, and can easily support the platform with minimal staff, provision new customers in minutes, and bring them live within hours.

SaskTel HCC design and delivery principles are founded on these architectural features:

Multi-Tenancy

SaskTel HCC allows multiple customers to run on a shared server environment. In the SaskTel HCC, tenant partitions are logically and securely separated. Because of this unique multi-tenancy design, SaskTel HCC can run just one instance of all software components, making it easy to manage and maintain, and delivering new features to all customers with every upgrade.

Automated Provisioning

Each tenant is configured so service parameters are provisioned via the Internet and are updated in real-time. Automated provisioning allows customers to configure and administer their entire contact center with one simple tool which can be accessed remotely. SaskTel HCC uses a version of this automated provisioning tool to set up new tenants easily and with minimal effort.

100% UNIX Based

SaskTel HCC UNIX-based platforms provide enhanced redundancy and availability that is critical for a scalable, reliable solution.

VoIP Softswitch

Software based telephony built on Session Initiation Protocol (SIP) based Voice-Over IP (VoIP) technology. This delivers scalability and manageability - in contrast to traditional hardware based switches. With it, SaskTel HCC provides greater flexibility for integration into carrier networks and is more cost effective to maintain.

Web Based Thin-Client Interface

SaskTel HCC delivers agent interface through the Internet and a web browser. It’s web-based thin-client interface enables easy upgrades and deployment by eliminating the need to install software on end user desktops, as required by solutions with traditional client/server architectures.

User Friendly Interface

Agents access all communication channels and components from one primary contact center screen virtually eliminating the need for agent training.

Security

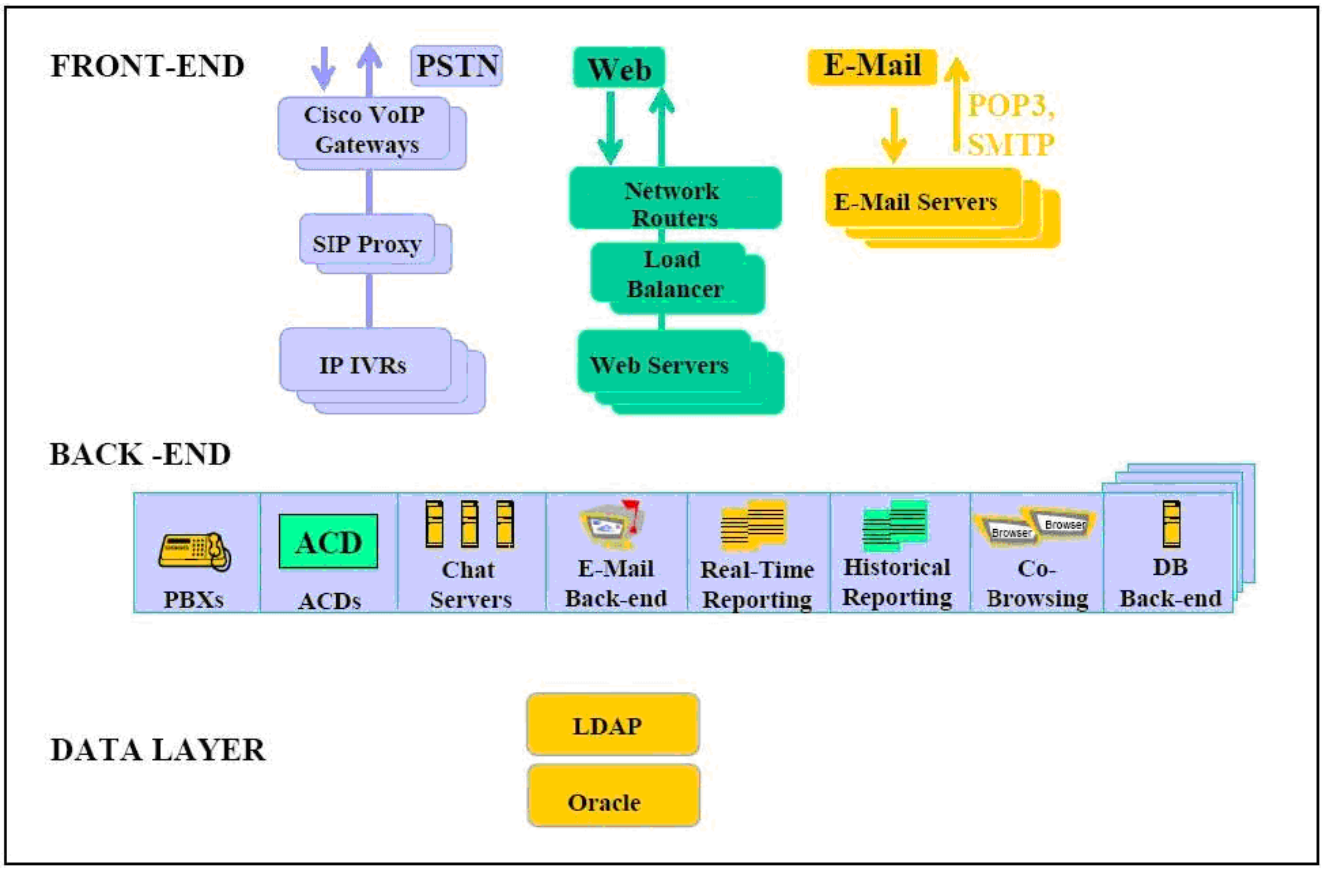
The SaskTel HCC production platform is designed with application-level and data center security, and a highly redundant infrastructure for maximum system reliability.

Open APIs

Application Programming Interface (API) provides a standardized means of integration with third-party applications. The SaskTel HCC API is implemented via Extensible Mark-up Language (XML), a standardized and platform-independent format for structured data exchange over the Internet. XML has received universal support across platforms, programming languages, and vendors and has become the language of choice for web-based data integration. SaskTel HCC XML-based API enables rapid integration with third-party applications in a multi-platform environment.

The foundation for a scalable environment

SaskTel HCC “Logical Software Architecture”



The SaskTel HCC logical software architecture is comprised of three primary components: the front-end, back-end, and the data layer.

The front-end consists of the communication channels within the contact center. The back-end contains all the services needed for the contact center integrated into one seamless environment. The data layer consists of the Lightweight Directory Access Protocol (LDAP) and the Oracle database, which stores all customer data and configuration information.

The SaskTel HCC front-end handles all communications within the contact center via telephone, email, web chat/web co-browse, and self-service. A set of web servers delivers interactions to the user interface.

The front-end supports a distributed environment where all interactions are load balanced across multiple processes and servers. This allows for a greater degree of scalability and reliability for all interactions, and helps guarantee system performance if there is a failure of any individual component. Should a component failure occur, the load balancer automatically distributes the interactions across the rest of the components.

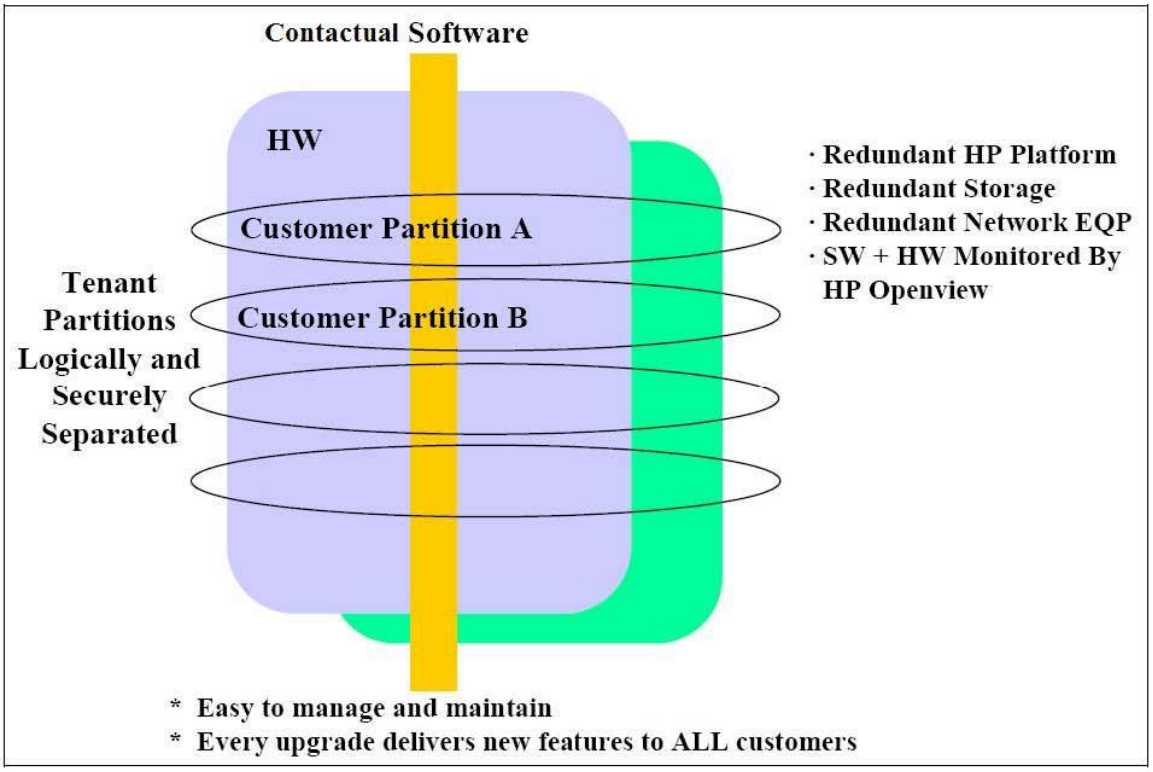
The back-end contains all key services that perform necessary business functions, including: skills based routing of voice, chat and email management services, unified queuing and routing services, real-time and historical reporting services, co-browsing services, and CRM-related services.

Each service is run in multi-instance mode where there are multiple PBXs, IVRs, etc., running at all times. As with the front-end, the back-end spreads these services across the multiple processes.

For both the front and back-end, the common integration bus is based on an Object Request Broker architecture (ORB). The ORB provides a coherent means of managing multiple applications and distributing the environment as well as load balancing. Every process is ORB compliant and supports Simple Network Monitoring Protocol (SNMP). This enables SaskTel to control and monitor the processes in real-time 24/7/365.

The SaskTel HCC data layer handles user configuration and authentication. The SaskTel HCC directory is built to the same industry standards used by most authentication carrier grade systems. The Oracle® database is one of the most scalable and reliable solutions for ensuring high availability of critical customer data.

Multi-Tenancy



SaskTel HCC operates in a unique multi-tenant environment, which, when combined with the web-based thin client infrastructure, translates to virtually instant deployment and activation, as well as minimal maintenance and support. Each transaction is handled by multiple service-related processes that are tenant independent.

Customers are automatically provisioned with a logical and secure partition for their own data and configuration. Each tenant runs on one hardware and software platform, reducing maintenance demand and spreading tenant load to realize full capacity of the hardware environment.

Because of this unique design, SaskTel HCC customers can configure their own contact center environment in real time. There is no need for SaskTel HCC operations to configure separate hardware and software for each individual customer, dramatically reducing configuration, maintenance, and support time. Additionally, every upgrade delivers new features to all customers.

Automated Provisioning

SaskTel HCC provides two automated provisioning tools that further reduce maintenance and support and increase ease of use: the Operations Console and the Configuration Manager.

Operations Console

SaskTel HCC operations uses the web based Operations Console to automatically provision the tenant (logical and secure partition) for each customer. The operation console is also used for continual management of billing procedures and ongoing monitoring of tenant and system usage. This significantly reduces maintenance and support and speeds initial implementation and upgrades.

Configuration Manager

Each SaskTel HCC customer can use the Configuration Manager to easily configure and provision service parameters for their entire contact center, over the web. Changes take place in real-time, without delay, because the Configuration Manager automatically propagates the changes throughout the multiple back-end servers.

Scalability

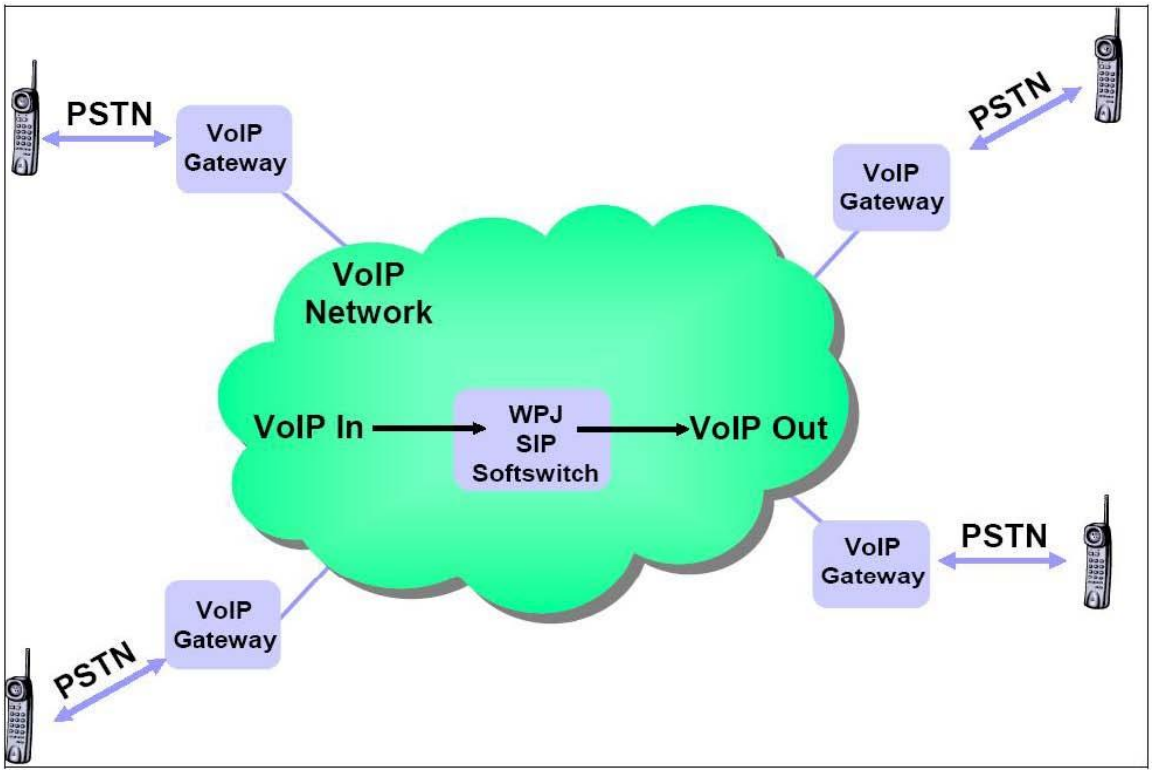
The SaskTel HCC hardware platform leverages a fully redundant network infrastructure between all internal components and diverse carrier networks to provide a reliable, scalable, and secure environment. The application integration bus, based on an ORB architecture provides a coherent means of multi-instancing and distributing the capacity of the hardware efficiently in this environment.

Reliability

The SaskTel HCC solution is based on N-Tier application architecture, which has multiple layers, each serving distinct and separate tasks (back-end, front-end, and data layers). This simplifies system management, enhances scalability, and reduces operational costs by separating business logic from presentation. Because this architecture distributes transactions so they are load balanced, a larger portion of the hardware is available for use at all times. The network infrastructure is fully redundant, with replicable system hardware for maximum reliability.

Critical components are paired, with one running and one in stand-by mode. All other components are operating in an n+1 load balancing environment with the load spread across multiple hardware platforms.

VoIP



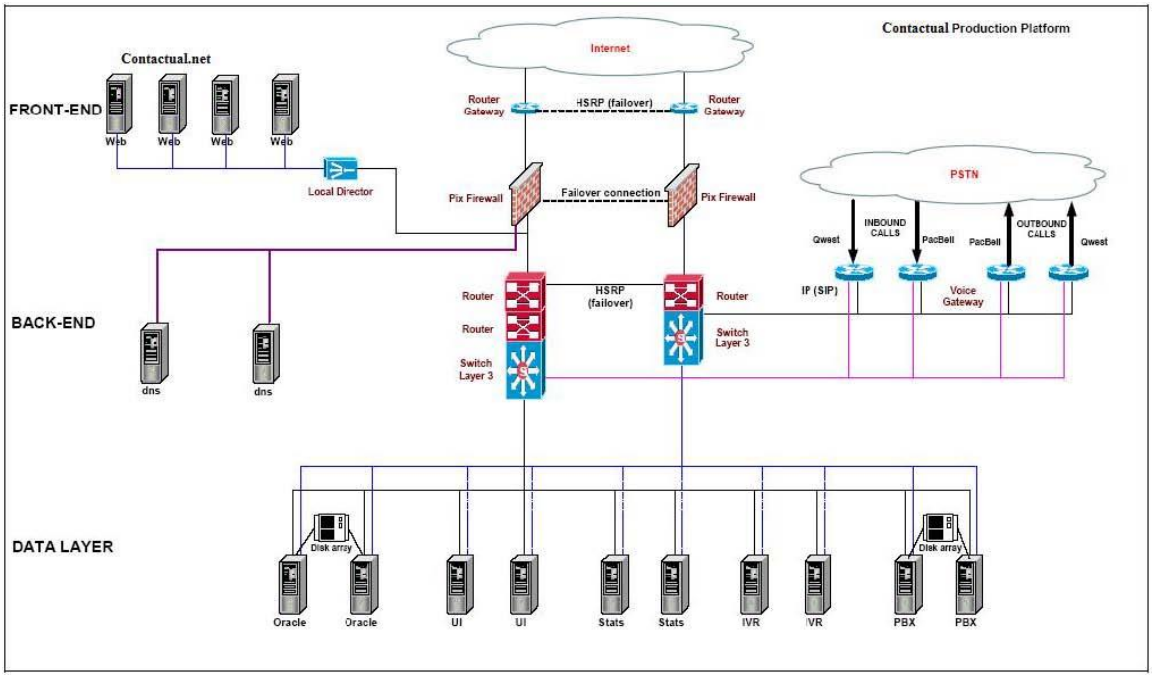
SaskTel HCC software-based telephony is built on SIP-based VoIP technology. Not only is software-based telephony easier to scale and manage, it also provides greater flexibility for integration and is more cost effective to maintain. The SIP-based VoIP protocol combined with VoIP Gateways allows SaskTel HCC to:

- Connect to the telephony network of carriers using PSTN or VOIP. This eliminates the need for any dedicated telephony hardware.
- Scale up simply by adding CPUs and memory to the system because the platform does not require dedicated telephony hardware.
- Provide end-to-end VoIP for optimum cost savings on calls. The SaskTel Hosted Contact Centre can be deployed quickly in a variety of VoIP networks for revenue generating services because they leverage the open standards-based SIP interfaces.

Availability

For ultimate availability, SaskTel HCC delivers a robust voice and network environment with extensive data redundancy, application and network monitoring, and high quality assurance procedures.

Overview of the SaskTel HCC Production Platform



As illustrated, all equipment works in teams, including servers, databases, routers, switches, firewalls, trunks, connections between trunks, with the Internet, and with PSTN networks. The servers and routers work simultaneously with automatic load balancing. If any component experiences an outage, the remaining team members can handle the load.

Staging and Stress Tests

SaskTel HCC conducts final testing and verification of all application updates before production deployment, to ensure that changes will not impact availability. They also stress test the platform with each new release.

Data Center

All SaskTel HCC platform components are located in a SaskTel HCC world class, HP certified data center. This high quality data center offers:

- Physical Security – security guards 24/7, electronically secured entries, closed circuit cameras, motion detectors, biometric scanners, and keycard access
- Environmental Security – building within a building, including a windowless environment, walls and doors with a fire rating of 1.5 hours, two-stage fire suppression systems with cross-zoned detection systems that respond to either heat or smoke, ventilation provided by redundant roof-mounted air conditioning units, a raised floor
- Reliability – redundant, parallel and synchronized uninterruptible power supply (UPS) systems, protection from power surges, three generators providing power for up to 2 weeks

Security

SaskTel HCC has multiple levels of security from the network, platform, and application to operations. Passwords can only be changed by support personnel. Original passwords cannot be accessed by support personnel.

Secure Sockets Layer (SSL) Support

128-bit SSL encryption can be used to access the SaskTel contact center platform.
Email can also be retrieved from a secure POP3 over SSL.

Network Penetration

SaskTel HCC conducts periodic penetration tests and does internal network security audits to make certain our network is secure.

Data Separation

Data and configuration information for each SaskTel HCC customer is stored on a separate database partition that is logically and securely separated.

Application Updates

The SaskTel HCC quality assurance team reviews all builds, updates, scripts, and integration code to prevent application corruption. New components are added to the production platform only after rigorous functionality, load, and acceptance testing is completed and final adjustments (if necessary) are made.

Database Management

Access to the database is limited to SaskTel HCC database administrators to eliminate any potential for unauthorized system manipulation.

User Authentication

The SaskTel HCC password controlling mechanism keeps intruders out while allowing trouble-free access for authorized users.

Virus Protection

Virus detection and eradication processes prevent the destruction of data.

Operations

The SaskTel HCC operations team follows strict policies and procedures to ensure customer data is safe at all times.

Personnel Security

SaskTel HCC conducts background checks to validate experience and qualifications on all employees who have administrative access to customer data through servers and applications. In addition, these employees are required to follow a security policy when dealing with confidential customer data.

Evaluation of Security Updates

SaskTel HCC follows a clearly defined process to evaluate vendor security alerts on operating systems and applications, ensuring that security patches and service packs are updated appropriately.

Audit Trails and Security Logs

A disciplined approach for performing and storing backups of audit trails and security logs is followed. This information is recorded using write-once technology.

Incident Handling

SaskTel HCC follows a documented procedure for dealing with intrusion detection, incident response, incident escalation, and investigation.

Validation Access

SaskTel HCC follows a documented procedure to authenticate callers and reset access controls within the SaskTel HCC application.

Private Label

SaskTel HCC separates the Hyper Text Markup Language (HTML) presentation layer from the business logic of the CRM source code. By providing solutions vendors with access to the HTML presentation layer, these vendors can deliver the SaskTel HCC solution as an integral part of their offering (private labeled) with their own look and feel.

Open APIs

The SaskTel HCC Application Programming Interface (API) is a tool for interacting with the SaskTel HCC application and data. The API is implemented via Extensible Mark-up Language (XML), a standardized and platform-independent format for structured data exchange over the Internet. XML has received universal support across platforms, programming languages, and vendors and has become the language of choice for web-based data integration. SaskTel HCC XML-based API enables rapid integration with third-party applications in a multi-platform environment.

Through the SaskTel HCC API, a third-party application can perform a number of actions to retrieve, add, or modify objects such as cases, customer contact information, or Frequently Asked Questions (FAQ's) stored within the SaskTel HCC database. Configuration information can also be retrieved. The API accepts XML packets from other applications sent via Hypertext Transfer Protocol (HTTP) or Hypertext Transfer Protocol Secure (HTTPS). Validation is checked on each packet, ensuring the request is authorized and password security is maintained. The API works a single record at a time and is not designed for bulk data storage or retrieval.

Conclusion

The SaskTel HCC customer service automation solution was designed with a unique architecture that makes it fast to deploy, easy to use, scalable, and secure. The design also makes it an ideal solution for service providers who can easily run SaskTel HCC on their existing voice and data network, and can customize the interface seamlessly.

About SaskTel

SaskTel is the leading full service communications provider in Saskatchewan, offering competitive voice, data, dial-up and high speed internet, entertainment and multimedia services, security, web hosting, text and messaging services, and cellular and wireless data services over its digital networks.

SaskTel also provides security monitoring services through SecurTek, directory services through DirectWest, telecommunications consulting service through SaskTel International and an out-of-province sales and service channel in Alberta and British Columbia. SaskTel and its wholly-owned subsidiaries have a workforce of 5,200 full-time, part-time and temporary employees.

SaskTel is a provincial Crown Corporation and has delivered leading-edge telecommunications to the people of Saskatchewan for 100 years. The SaskTel serving area within Saskatchewan links 13 cities with 535 smaller communities and their surrounding rural areas, including 49,000 farms. All told, SaskTel serves more than 425,000 business and residential customers.

For more information on SaskTel, please go to **www.sasktel.com** or call **1-800-SASKTEL (1-800-727-8535)**.

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