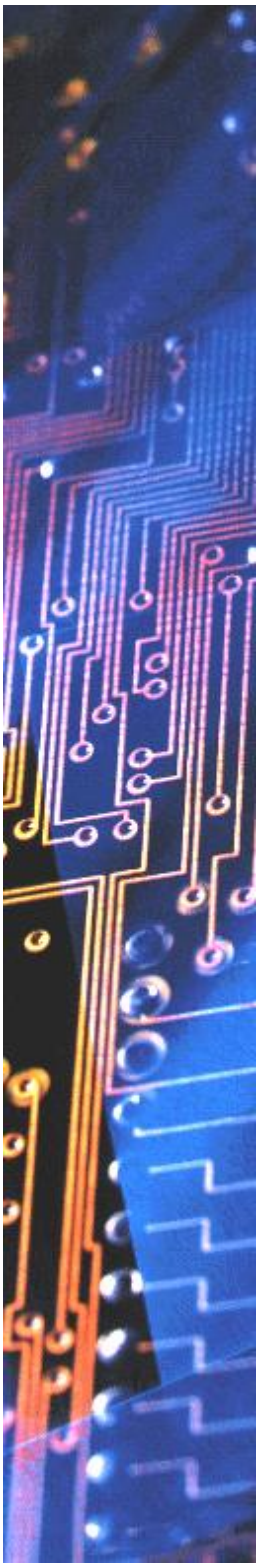


Praxa

SWITCHgate Rel 8.3

System Integration Infrastructure

Product Overview

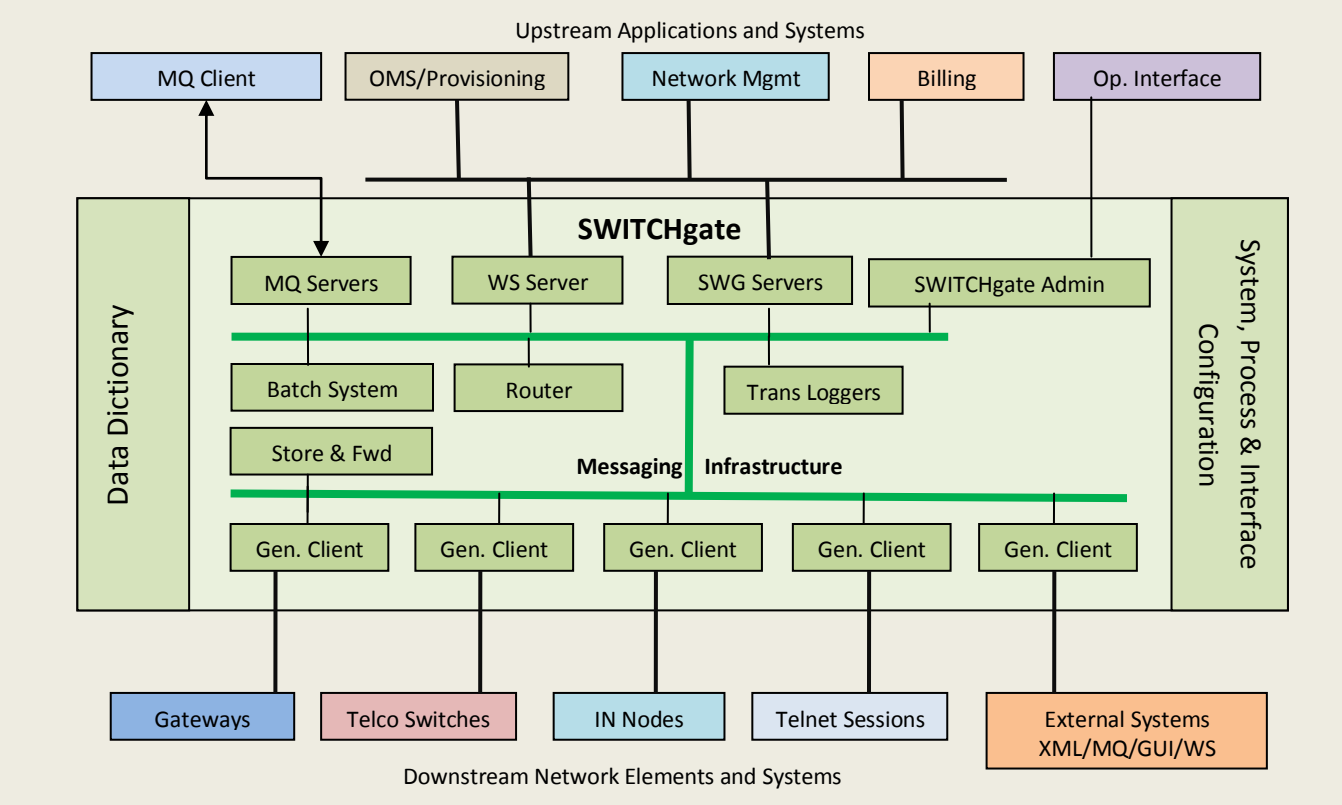
SWITCHgate OVERVIEW

SWITCHgate is a System Integration Middleware product initially developed for the Telecommunication industry. Over the years SWITCHgate has evolved into a generic System Integration infrastructure making it suitable for application in other areas. SWITCHgate provides System Integration functions such as Messaging Middleware, Transaction Processing, EAI and Web Services.

SWITCHgate architecture is component based. Based on requirements, appropriate SWITCHgate components are combined and configured to implement specific solutions.

SWITCHgate solution components are designed for the Unix environment and have been developed in C, C++ and Java.

In telecommunication application SWITCHgate provides mediation for commercial systems (eg. CRM, OMS, Billing, etc.) to provision and integrate components such as telephone switches, IN systems and external gateways.



Product Summary

SWITCHgate reflects Praxa's experience since 1994 in providing System Integration and Mediation solutions to Telecommunication companies in Australia, UK and New Zealand.

SWITCHgate provides System Integration functions such as Messaging Middleware, Transaction Processing, EAI and Web Services.

SWITCHgate is also used to integrate legacy systems, network elements and other network enabled equipment into a service environment.

SWITCHgate System Integration solutions are reliable, efficient, cost effective and low maintenance.

SWITCHgate process components are built upon a system integration infrastructure that provides features such as:

- Metadata based service definition
- Messaging infrastructure
- Service Oriented Architecture
- Optional in-memory virtual database to retrieve, hold, manipulate, commit/ rollback service transaction data – supports SQL interface, service locking, concurrent sessions.
- Centralised registry for configuration at system, process and interface levels.
- Real time monitoring and stop/start/reconfiguration of individual processes on the fly.
- Multiple upstream interfaces JMS(XML), WS(WSDL), Java/C (embedded SQL) API, and custom messaging
- Generic and customizable client process components to handle interfaces to downstream systems
- Online and Batch transaction processing
- Full transaction and event logging
- Web based system monitoring and transaction statistics database

Rapid deployment is a key advantage of SWITCHgate.

Go Forward

Praxa offers SWITCHgate licensing, implementation and runtime support services to suit different scales of implementation.

A SWITCHgate system is controlled by scalable deployment configuration. The system behaviour, its capacity and throughput can be easily configured to suit end-to-end requirements and limitations.

Praxa provides consultants to assist in defining requirements such as mapping of business transactions to network instructions. Praxa also offers product configuration, training, integration testing, deployment and support services.

Business Usage

SWITCHgate systems have been used in a variety of mediation scenarios; the following list briefly describes some of SWITCHgate implementations:

- Order Management System, Customer Care GUI and a Billing System connect to SWITCHgate to provision services on an IN platform. SWITCHgate presents an abstract view of the services that hides the complex IN interface from the applications.
- A Billing System connecting through SWITCHgate simultaneously provisions action bar/unbar of wireline service on fifteen identical switches from a single application request.
- Front End Systems, Customer Care GUI and a Data Bulk Load System connect to SWITCHgate to provision GSM subscriber service distributed over multiple GSM switches. SWITCHgate presents a different abstract view of the same service to suit different applications requirements.
- Order Management System connects to SWITCHgate over web service interface for full VOIP subscriber provisioning on Nortel CS2K switch accessed via Nortel OSSgate.
- Application managing wireline/mobile number portability connects to SWITCHgate over web service interface to simultaneously provision HOC on multiple Nortel DMS and Broadworks VOIP switches. Employs SWITCHgate's Store & Forward functionality for guaranteed application of all transactions in their original sequence on all switches.
- Upstream SMS Paging application connects to a SWITCHgate based system to provision a local subscriber database. Multiple downstream external Paging Bureaus connect to this system and query subscriber records to operate the service. The system employs SWITCHgate's Store & Forward functionality to ensure all transactions are replicated to a backup (redundant database) in their original sequence.

SWITCHgate systems have a provisioning interface with a variety of Telco switching elements such as Nortel DMS100, Nortel CS2K via OSSgate, Broadworks VOIP, Nortel DMS-SDM, DSC SMS (IN), Nortel IN, Nortel GSM, Nortel HLRPS, Nokia GSM, Ericsson AXE and Lucent Voicemail.

BENEFITS

- Simplify service provisioning by presenting abstract view of complex service data and provisioning actions.
- Simplify and reduce time/effort required for upstream application development, implementation and system integration.
- Improve end-to-end service reliability and integrity via built-in transaction management and recovery processes
- Reduce time to market for new services via fast configuration changes
- Easily fulfil business requirements by providing multiple application interface options
- Reduce maintenance costs via self monitoring and self recovery
- Reduce maintenance costs by insulating upstream applications from downstream changes and vice versa.
- Reduce solution implementation effort through SWITCHgate tools for testing, data conversion, bulk loading, etc
- Provide best fit solutions by allowing customisation at all levels
- Delivers greater reliability and lower maintenance cost with full reuse of existing stable SWITCHgate components.
- Reduce network requirements by allowing multiple service types to be provisioned over a single network element session.
- Governance via on-line access to system configuration repository using admin utilities to monitor, stop, start and configure SWITCHgate component processes on the fly.
- Ability to monitor transaction history with help of web based utilities to search, view and chart transaction data and statistics stored in an internal database.

FEATURES

SWITCHgate design is based on component based architecture and has evolved over the years to incorporate new technologies and best practices.

The main features of SWITCHgate can be grouped under the following architectural aspects:

Data Abstraction

A Data Dictionary or database schema is provided to define services, data attributes, and provisioning actions.

Service definition using the Data Dictionary provides an abstract view of service information and provisioning actions.

Data abstraction decouples the upstream view of services from their actual implementation on downstream systems.

Upstream applications interact with SWITCHgate to access the defined abstract services and SWITCHgate transforms this interaction to drive the actual interface to downstream systems.

This feature also allows the same service provided by multiple disparate downstream systems to be accessed via a common service definition.

Virtual Database

The virtual database (VDB) is used to retrieve, hold, manipulate, commit/ rollback service data during a transaction.

The VDB supports SQL interface, service locking and concurrent sessions.

Applications manipulate services defined in the Data Dictionary by performing permitted SQL operations on the VDB. SWITCHgate uses configured rules to interpret these operations to populate the VDB and/or apply transaction actions on downstream external systems.

The SWITCHgate VDB feature is a key differentiator from other SI middleware products.

The use of VDB is optional in a SWITCHgate implementation.

Messaging Infrastructure

The messaging infrastructure provides mechanism for handling and transport of messages.

SWITCHgate component processes use the messaging infrastructure to communicate with each other and with external systems.

The messaging infrastructure is integrated with the Data Dictionary and supports the encoding and transmission of service request/response messages.

Configurable Processing

SWITCHgate solution is implemented by combing and configuring appropriate SWITCHgate component processes.

- **System Configuration** controls the overall process layout and run-time environment.
- **Process Configuration** controls individual process behaviour and defines its interfaces to other processes.
- **Interface Configuration** provides each process with appropriate control over I/O and message processing over individual interfaces.

SWITCHgate Configuration enables its solutions to be scalable and flexible.

SWITCHgate configuration is maintained in a centralised registry accessible from system admin and monitoring tools. It enables stop, start, reconfiguration of individual processes on the fly.

The configuration registry allows a resident admin process to check on all configured component processes and restart them if required.

Inter-process Communication

SWITCHgate supports transport independent inter-process communication.

SWITCHgate processes are designed perform I/O on logical devices. Process configuration specifies the actual transport and behaviour of each logical device at runtime.

The use of logical I/O devices is central to making SWITCHgate process layout and inter-process communication configurable.

This also enables testing of individual process components or solution subsets in a test harness.

Processing Modes

SWITCHgate provides a choice of transaction processing modes such as:

- **On-line** – The application request is processed through to the external element and response from the external element is passed back to the waiting application.
- **Store & Forward** – The application request is validated and stored by SWITCHgate and a success response is sent back to the application. SWITCHgate then sends the request to the external element. If the external element is unavailable then the request is retried.

Store & Forward is suitable when the external element is not always available or where one transaction is to update multiple external elements.

- **Publish & Subscribe** – This is Store & Forward in both directions. Requests are supplied in the same manner as Store & Forward. The response from the external element is stored along with the request id. Responses are delivered when the subscribing application connects to SWITCHgate.
- **Batch** – The application supplies requests in a file copied into a designated directory.

  The SWITCHgate Batch System processes the batch file through SWITCHgate and saves processing results formatted in a result file that may be automatically post-processed for reporting.

  The Batch System can be easily configured for new requirements, and is therefore suited for ad-hoc bulk data loads, data conversion and data extraction jobs.

  Also see Configurable Switch Interface.

Interface Options

SWITCHgate support a variety of upstream interfaces.

A JMS/XML interface allows message queue access to SWITCHgate services. An XML schema for SWITCHgate services is also provided.

SWITCHgate supports a generic WSDL based web service interface to all SWITCHgate services.

The web service interface is password protected and SSL encrypted. The web service is based on Apache Axis2-1.3 and deployed on Apache/Tomcat 6.

Other SWITCHgate interfaces are Java and C (embedded SQL) APIs, generic request/response messaging protocols and custom built protocols.

Interfaces via third party products can be provided if commercially viable.

Configurable Downstream Interface

SWITCHgate uses a generic client processes to handle interfaces to downstream network elements.

Each generic client process interprets its allocated interface control configuration for all provisioning actions.

The interface control configuration can encode complex logic to control the dialogue between the generic client process and the designated network elements.

The interface control configuration can be easily changed to add new provisioning actions.

The configurable downstream interface feature enables easy and efficient implementation of complex provisioning actions.

Rule-based Routing

SWITCHgate provides choice of routing components to that may implemented to route messages between component processes. The routing rules are configurable and are normally loaded at system start up but may be changed at runtime.

Local Database Option

SWITCHgate provides an option to store service data in a local database system that is integrated with the Data Dictionary.

The local database is populated and updated by data from transactions flowing through SWITCHgate.

The local database may be used for service enquiry or for data reconciliation across multiple external elements.

Event Logging

SWITCHgate provides logging of all request, response and alarm messages. The logged information is written to daily log files. The log files may be configured to be in a weekly, monthly or yearly cycle.

Transaction History Database

SWITCHgate extracts data from transactions passing through and stores the data in an internal database.

This data can be searched, viewed and charted via a set of supplied web apps.

On-Line Administration

SWITCHgate provides terminal and web based administration and monitoring of component processes via access to the centralised configuration registry.

SWITCHgate administration enables stop, start and reconfiguration of individual processes on the fly.

SWITCHgate may also be integrated with external systems for remote monitoring.

A detailed product specification document is available on request.

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