Augustine Samba, Ph.D

SELECTED RESEARCH & DEVELOPMENT (R&D) PUBLICATIONS (PEER-REVIEWED PAPERS)

SELECTED PUBLICATIONS

During my 18 years tenure in the telecommunications/communications industries, I produced numerous papers. The majority included novel algorithms for solving real-world telecommunications, Network Systems, and Information, Communications and Technology problems.

Due to the proprietary nature of the research and development, these novel algorithms/publications were kept out of the public domain

1. *A. Samba, A. Boros and O. Lafe (*2002) End-User Communications System Access Network. QuikCAT Technologies, September 25, 2002, 19 pages.

ABSTRACT

A novel data communication system, which facilitates integration of both wireless and wired communication devices with core backbone and service provider networks. The data communication system includes a sub-network, which provides enhanced data transport and managed IP services for service providers. Managed IP Servers process data at the IP layer and perform encryption, decryption, compression, and decompression functions, thereby enabling the provision of content-based services to end-users

2. *Augustine Samba, (*2002). *The Design of MicroCell Mobile Terminal (MMT) Units for wireless communications*. QuikCAT Technologies, July 1, 2002, 27 pages.

ABSTRACT

A new cellular telephony infrastructure is being proposed. The proposed system, MMT, does not require expensive Base Station Towers, Mobile Switching Centers, Home Location Registers and/or Visitor Location Registers. Additionally, the MMT infrastructure relieves Service Providers from purchasing expensive Network Management Systems, Operations Support Systems or Network Elements in order to perform Operations, Maintenance and Administration of their cellular network infrastructure.

The MMT is a scalable system whose performance improves as the number of subscriber base increases. This is not the case with existing wireless networks **especially in busy** metropolitan centers where users often experience high dropped call rates.

With MMT, every subscriber in the network is a potential courier. The result is a high level of redundancy. The MMT network is robust and it remains operational even if there is an attack in some portions of the network.

3. *A. Samba, (*2001) Internet Accelerator ("iNet"). QuikCAT Technologies, September 18, 2001, 22 pages**.**

ABSTRACT

The iNet product transforms wireless access technologies and dial-up copper lines into a faster data delivery media, allowing service providers to generate new revenue from their existing network infrastructure. The iNet solution enables service providers to offer scalable, reliable, faster data services while minimizing network administration and operations costs.

End-users' communication needs have become increasingly sophisticated as computers and Personal Digital Assistants continue to be more powerful and widespread. The digital revolution has created a host of multimedia services and web-based applications for End-users. While these services and applications provide more effective ways of communicating, they are clogging low-speed data pipelines. The bottleneck remains in the so-called "last mile". In the wireline environment, this is the local loop from the Central Office to the Customer Premise Equipment. In the wireless world, this refers to the Over-the-Air link between the Mobile/Wireless End User's device and the wireless access network infrastructure.

The iNet access technology neatly overcomes a number of bandwidth limitations within existing wireline and wireless access network infrastructures. This paper provides an overview of the iNet – the QuikCAT solution for end-user wireless and wireline access to the Internet and Corporate/Private networks.

4. *A. Samba, (*2000) *CAT Network Intelligent Peripherals for Wireless Intelligent Networks*. QuikCAT Technologies, September 29, 2000, 24 Pages.

ABSTRACT

The CAT Network Intelligent Peripherals (CATNIP) transforms PDA devices into real-time multimedia personal communications systems. The CATNIP embedded software solution is a unique technology. The CATNIP employs the QuikCAT® Technologies content-sensitive compression, encryption and filtering algorithms optimized for real-time multimedia personal communications. The CATNIP innovative technology facilitates real-time video/data communications in low-bandwidth and low-processing-power situations, which is typical for PDA-to-PDA in 2G and 2.5G wireless networking. The highly configurable processing components allow instantaneous adjustments to network conditions and changes in user preferences. The low reliability of current wireless data networks is accounted for by numerous recovery strategies from wireless connection loss

5. *A. Samba, (*2000) The QuikCAT Optimized (Level-3) Network Architecture. QuikCAT Technologies, September 25, 2000, 19 Pages.

ABSTRACT

This document describes the network optimization for the re-architected QuikCAT subnet. The network is re-architected with the following goals:

- Provide seamless integration into the ISP Data Center
- Provide a product that can scale up for large customers1.
- Reduce (or eliminate!) the network latency
- Reduce performance bottlenecks in the existing architecture.
- Provide a viable software base for offering new and enhanced IP content-based services across the internet for Mobile PCS, Wireless and Wire-line subscribers

The re-architected product takes a "lower level" view of QuikCAT packets transported over the Internet, and between Clients and the QuikCAT subnet. It exploits the IP-layer processing scheme inherent in per-to-peer router communications over the Internet. The basic Internet transport service is datagram oriented, with reassemble taking place at the destination Internet protocol module in the destination host (Web Site). Using datagrams as the unit of compression effectively eliminates TCP packet reassembly and disassembly within the QuikCAT subnet

6. *Augustine Samba, and Anthony Buttitta (*1998) NPA Split Management in Intelligent Network Environment*. Lucent Technologies,* September 30, 1998, 47 pages.

ABSTRACT

An NPA split management system and associated methods for receiving from a user descriptive instructions regarding upcoming NPA split, and responsively updating components of the Intelligent Network (IN) to reflect changes in the NPA codes assigned to Wireless and Wire-line IN services, subscribers etc. A user interface operating in conjunction with a Service Management System allows the user to declare an NPA spilt and define its characteristics, including the old NPA code, the new NPA code the central office codes to be "transferred" to the new NPA, and the dates of the beginning and end of the Permissive Dialing Period (PDP). The SMS contains indicia corresponding to SMS-managed object databases, which definitively specify whether the data contained therein is affected by an NPA spilt. The SMS determines which items require updating to the new NPA code, and on which components the affected databases or services reside. The SMS transmits to each affected Intelligent Network component instructions to update the affected databases (or other items) by replacing the old NPA code with the new NPA code. The Intelligent Network component executes the update instruction and installs a translation table entry. When transactions arrive during the PDP, the Intelligent Network component translates mentions of the old NPA to the new NPA before providing the requested telecommunications service as the updated database no longer has references to the old NPA.

[1] It is also desirable to scale down for small customers with a pay as you grow approach.

7. *Augustine Samba & William Belson, (*1999) *Data Requirements Analysis and Modeling of Standalone Home Location Register (SHLR) and Authentication Center Databases for CDMA Wireless Networks".* Lucent Technologies October 10, 1999, 21 Pages.

ABSTRACT

The Home Location Register (HLR) is a database within the cellular network for storing subscriber information. The HLR provides a unique capability, which allows cellular subscribers to utilize their cell phones while roaming outside of their Home Service Area. The HLR database is accessed each time a subscriber either enters a new Mobile Switching Center (MSC) or initiates a call for which the serving MSC does not have the subscriber's record. The Stand-alone HLR (SHLR) is an HLR database, which is physically and logically separate from the MSC. The SHLR serves as a centralized database for supporting multiple MSCs. The Authentication Center (AC) feature allows MSCs to identify valid Authentication-capable mobile units operating in either the digital or analog mode. The AC capability enables Service Providers to control fraudulent use of their MSCs and SHLR by identifying and subsequently denying services to unauthorized mobiles
This document describes the logical data model for the Authentication Center (AC) feature and the following SHLR features:

- Communication Assistance Law Enforcement Act (CALEA)
- IS 771 Standard WIN Triggers
- TDMA Circuit Mode Data
- CDMA Circuit Mode Data
- Packet Mode Data
- User Zone
- Flexible Alerting
- Mobile User Same Directory Number
- Short Message Service Center
- Call Forward Digit Screening (CFDS)
- Authorized Roaming List (ARL)
- MIN Based Routing
- Call Delivery
- Call Forwarding
- Call Waiting
- Call Transfer
- Calling Number Identification Presentation (CNIP)
- Calling Number Identification Restriction (CNIR**)**

Entity-Relationship Diagrams (E-RD) are employed for illustrating the logical data models. The E-RD approach is independent of the SHLR and AC implementations.
The data model provides a framework for enhancing the existing service, developing new services, and analyzing feature interactions of SHLR

8. Augustine Samba, (1999). End-to-End Network Requirements and Gap Analysis for the BellSouth Line Information Database (LIDB). Lucent Technologies, March 12, 1999, 30 pages.

ABSTRACT

The LIDB is a large database of 30 to 75 million records for subscriber line information and Special Billing Numbers.
This document identifies BellSouth's Line Information Database (LIDB) Network Architecture and LIDB cross-component requirement gaps/issues. The purpose of this document is to identify only the LIDB requirement issues pertaining to the following functional areas:

- Network Architecture
- Call Processing Scenarios
- Data Provisioning, Data Schema, and Data Flows
- Operations Administration and Maintenance (OA&M)
- Performance, Capacity, and Reliability
- Dependencies on INU and non-INU products

The LIDB service will be deployed on the same SCP that BellSouth is currently running the Local Toll Free (LTF) Service Package Applications. The scope of this document, however, is limited to the LIDB service.

Augustine Samba and Eduardo Mu (2000). The Illinois Number Pooling Feature Requirements. Lucent Technologies January 29, 1999, 15 pages.

ABSTRACT

The Ameritech customer needs to provide Number Pooling, in order to slow the exhaust of available Telephone Numbers (TNs) per Numbering Plan Area (NPA). This is achieved by removing the association of NXX with a particular end office. Under the FCC pooling guideline, blocks of 1000 (NPA-NXX-Y) rather than 10,000 (NPA-NXX) TNs can be "pooled" to a particular Service Provider's End Office.

The Lucent Service Management System (SMS) communicates with the Number Portability Administration Center (NPAC) system in order to provide an OSI management view of the Local Number Portability (LNP) network, LNP subscription resources; and also provision the Service Provider's LNP Network Elements.
In general, when a new network (new switches, NPA-NXX or Location Routing Number (LRN) data for service providers) or subscription data is created or existing network or subscription data is modified on the NPAC, the data is automatically updated in the SMS via CMIS/CMIP operations over the mechanized interface. The Lucent LSMS then creates a representation of the corresponding network or subscription data object, within the OSI environment that are subject to management by the NPAC. The objects are held in persistent storage in the SMS Management Information Base (MIB). The SMS translates the subscription version data into the Service Control Point (SCP) model and subsequently initiates provisioning requests to the active SCPs based on the upstream request from the NPAC

Augustine Samba, (1998), Ameritech Service Management System (SMS) K-460 Conversion. Lucent Technologies. December 4, 1998, 18 pages.

ABSTRACT

The Lucent Service Management System (SMS) is currently deployed at two different sites in Ameritech. An SMS is located in the Systems Integration Lab. The lab SMS is used primarily for testing and systems verification prior to deployment. The ELGIN site has a production SMS. The production SMS provides service management capabilities feature within the Ameritech network.
Ameritech has requested conversions of each of the existing lab and production LNP SMS platforms to a new hardware; and subsequent migration of the data and file systems from each Source SMS to the target SMS.
Lucent personnel will perform the conversion and migration initially on the lab SMS. The Ameritech personnel will subsequently perform a mandatory one-week regression test on the target lab SMS. Ameritech will use the regression period to verify the conversion and migration process. Upon successful completion of the regression tests, Ameritech will cutover the existing lab SMS to the new (SMS K-460) lab machine. Ameritech will subsequently request Lucent personnel to adapt the SIL SMS conversion and migration strategies to the existing production LNP SMS located at the ELGIN site.
This document provides the set of requirements and guidelines for each of the conversion and migration sequence.

Augustine Samba, (1998), WorldCom Service Management System (SMS) K460 Conversion. Lucent Technologies, November 4, 1998, 18 pages.

ABSTRACT

WorldCom has a production SMS at their Tulsa site in Oklahoma. The production system provides service management capabilities. WorldCom would like the data on the production system to be migrated to a target SMS. The target SMS will be installed at a different site in Clinton Mississippi. Upon successful completion of the data migration, the target SMS will provision existing service and subscriber data into a newly installed lab SCP at the Tulsa site. The target SMS will subsequently undergo a mandatory 4 week regression test period by WorldCom personnel prior to cutover to the new Production system. This document provides the set of systems engineering requirements and conversion sequence guidelines for the Method of Procedure (MOP).

Augustine Samba, (1998) Monitoring the Service Management System to the Service Control Point TCP/IP path. Lucent Technologies. June 22, 1998, 13 pages.

ABSTRACT

The Internet Protocol provides an unreliable, connectionless datagram delivery service: A datagram from the SMS/NE host travels from gateway to gateway until it reaches one that can deliver it directly to its final destination. Besides failure of communication lines, an IP fails to deliver datagram when the destination NE is temporarily or permanently disconnected from the network, or when the intermediate gateways become so congested that they cannot process the incoming traffic.
This document discusses the mechanism used by the SMS to detect TCP/IP network failures over the SMS-NE interface and report the cause of the delivery errors via the SMS Status Display and the external Surveillance system. The SMS Systems Administrator and the Network Administrator must take the necessary actions to review the SMS report and

correct existing network problem(s). This document specifies the algorithm and Systems Engineering Requirements for monitoring the TCP/IP path.

Augustine Samba, (1998) The Service Management Systems Interface Specifications for Authentication Center (AC) Mobile Subscribers Provisioning in Wireless Intelligent Networks. Lucent Technologies, March 30, 1998, 14 pages.

ABSTRACT

Sprint PCS has requested an SMS utility that could be used to update a number of AC Subscriber records. Specifically, once the Authentication Feature is available in the Sprint PCS network and existing HLR Subscribers have an AC record, there may be a need to change the Authentication Override Flag from "Y" to "N", or vice-versa. In order to meet Sprint PCS needs, the SMS should provide the following capabilities:

A Graphical User Interface screen that accepts the following:
A Mobile Identification Number (MIN) Range or a List of MINs to update
A field in the AUTH_TBL Real-Time Database (RTDB)
Value for the selected field, corresponding to the selected MIN(s)
Validating each MIN value

Provisioning the appropriate Network Elements
Updating the SMS AUTH_TBL RTDB
A status screen display for querying and viewing the status of the AC Subscriber Provisioning operations
This document describes the SMS AC Subscriber Provisioning operations. The underlying SMS algorithm, along with the SMS-SCP interfaces and the systems engineering requirements are also described.

Augustine Samba, (1998) SMS Download of Local Number Portability data to Appropriate Network Elements. Lucent Technologies, March 9, 1998, 7 pages.

ABSTRACT

This document describes a new algorithm that provides the SMS with the capability to provision LNP subscription version data to appropriate Network Elements based on a Service Provider's preferred routing scheme.

When a new subscription data is created or subscription data is modified or deleted on the Number Portability Administration Center (NPAC), data is automatically downloaded to the SMS. When the SMS receives the subscription version data, it validates applicable Managed Object (MO) Instances associated with the Subscription **Versions, updates the** SMS Managed Information Base (MIB) and subsequently provisions pertinent MO attributes to the Service Provider's Network Elements.
The SMS Administrator may also initiate a manual FTP download of subscription data from the NPAC to the Service Provider's SMS. The FTP download files provide another

alternative for creating new subscription version MOs in the SMS MIB.

Service Providers have requested the SMS to provision the pertinent LNP Subscription Version MO attributes based on a customized routing scheme. The choice of the routing scheme is dictated by the engineering rules specified for the Service Provider's IN. In particular, Ameritech has requested a routing scheme based on NPA-NXX-X of the ported DN; whereas WCOM prefers a scheme based on the NPA-NXX of the ported DN.
In order to meet the diverse needs of our customers, the Lucent SMS will support the following optional routing schemes:

Mapping of NPA-NXX range and Service Provider ID (SPID) to NE

9. *Augustine Samba, (*1997) *The Service Management Systems Requirements for "SendText" Operations*. Lucent Technologies, April 7, 1997, 19 pages.

ABSTRACT

The SendText feature provides SMS with the capability to support a new operation, which sends a text string (e.g., command) embedded in the operation, to a target object on the Network Element. Valid target objects are Service Package Application (SPA) Subscription Objects. The text string can be used to update the SPA global or Customer Static data on the Network Element. This feature will be used primarily by SMS Administrators, although it will be under the control of the Service TCTs. The SMS user will be able to initiate several actions within a remote NE SPA via the text in the SendText operation. This document describes the set of functionalities and the Systems Engineering Requirements for the SMS

10. Augustine Samba, (1997) Changing Mobile Identification Number (MIN) Requirements. Lucent Technologies, February 26, 1998, 13 pages.

ABSTRACT

Sprint PCS requested the SMS to support Change MIN functionality over the ACTIVIEW Operations Support System interface. The Change MIN functionality allows the ACTIVIEW System to initiate provisioning requests to the SMS in order to accomplish the following tasks:

Copy; Insert new Mobile Identification Number (MIN) AC record and Delete old MIN AC record

Delete old MIN Home Location Register (HLR) record and Insert new MIN HLR record.
The Delete and Insert HLR requests are done via existing provisioning requests, which are separate from the new SMS-AC-Change MIN atomic request described in this document.

The following restrictions are always enforced during normal SMS processing:
An HLR record must exist prior to inserting a new corresponding AC record.
The AC sub record must be deleted prior to deleting the associated HLR record.
Sprint PCS has lifted both of the above restrictions during processing of a Change MIN request. This will allow SMS to insert an AC record, before the associated HLR record has been created.

Sprint PCS also restricted the SMS from storing the current values of the following AC RTDB field names for subscriber Shared Secret Data (SSD):

- AUTHSSDA
- AUTHSSDB

The current SSD values are set by the NE SPA in the NE's AC RTDB subscriber records. The NE does not forward the current SSD values to the SMS.

The majority of AC data for an individual mobile subscriber is being stored in a single record in an RTDB. Within this record is both data, which is provisionable on SMS as well as data, which is changeable by either the Service Package Application (SPA) or the network. The SMS receives CORC updates from the NE for only four AC RTDB fields names: AUTHKEY, AUTHCALLCNT, AUTHAUTSSDVALID and AUTHAUTOSSDUPD. Moreover, the values of individual field names could also be modified at the SCP via RCV forms. In the absence of the SMS-SCP RTDB Audit feature, the SMS may never have the "Golden Copy" of some of this data, which is changing very rapidly. It is therefore necessary to retrieve the subscriber record from the Donor WSCP when migrating a subscriber from a Donor WSCP to a Recipient WSCP.
This document describes the algorithms and Systems Engineering Requirements for the SMS Change Mobile Identification Number (MIN) feature

11. *Augustine Samba, (*1996) The Lucent SMS Software Architecture for Local Number Portability. Lucent Technologies, December 12, 1996, 25 pages.

ABSTRACT

This document describes the Systems Software Architecture for developing the Local Number Portability feature. The architecture supports TMN Q3 protocols, Multi-Use Assets, Real-time provisioning and industry critical FCC performance requirements

12. *Augustine Samba, (1995*) Network Routing Controlled by a Management Node. AT&T Bell Labs, February 24, 1995, 25 pages.

ABSTRACT

A network management node collects trunk loading data and switch congestion data from switches in a telecommunication system. Path loading vectors, constraint vectors and switch congestion vectors are calculated and compared to yield potential intermediate switch candidates having the lowest available trunk traffic loading and switches with the lowest congestion consistent with other constraints associated with intermediate switch selection. Trunk groups with increasing levels of traffic and switch congestion are incrementally tested in order to yield potential intermediate switch candidates whereby call distribution to the lightest loaded trunks and switches is accomplished

13. *A. Samba, K. Teutsch (1995). The Automatic Reroute Control (ARC) System Architecture, May 12, 1995*

ABSTRACT

This document describes the software architecture for implementing the Automatic Reroute Algorithm. It provides a description of the Processes, Internal and External Interfaces, Input Messages, Output Messages and Inter-process Communications for the ARC system.

14. *Augustine Samba, (*1994) *The Total Network Management (TNM) System - Electronic Switching System (4ESS/1B™) Interface Capability Test Plan*. AT&T Bell Labs, June 9, 1994, 44 pages.

ABSTRACT

This document specifies the lab-to-lab tests for validating the Multiplexed Asynchronous (MASYNC) data handler subsystem of the TNM R4 Network Element Interface (NEI) feature package. The MASYNC subsystem provides remote centralized maintenance and surveillance capabilities for the 4ESS/1B™ Switch in the AT&T-NSD and Local Exchange Carrier Networks. This subsystem is required for each 4ESS/1B™ Switch actively being monitored. Maintenance personnel at the Technical Control Center (TCC) receive telemetry alarms, via the MASYNC Packet Interface Session & Application Data Handler (PI-SADH) whenever critical changes to the 4ESS Switch's state of health occur. The TNM makes requests of the 4ESS Switch and controls the interface to the 4ESS/1B™ Switch by means of messages. Similarly, the 4ESS/1B™ Switch responds to TNM's request via messages. This document specifies the strategy and guidelines for testing the MASYNC PI-SADH of the NEI feature package for TNM R4.

15. Augustine Samba (1991), Systems Architecture for the Link Fault Sectionalization feature, Switching Division, AT&T Bell Labs, October 1991

ABSTRACT

This document describes the systems architecture for the Link Fault Sectionalization (LFS) feature. The LFS is designed to identify faulty sections and components of digital SS7 links, interconnecting the 5ESS switches, 4ESS switches, AUTOPLEX and the Signaling Transfer Points (STPs) in the telecommunications networks, through test procedures initiated from an Operations and Maintenance Center

16. Augustine Samba, (1989) *Telecommunications Traffic Simulations and Modeling of the Bangkok Metropolitan Network and Thailand Toll Network*
AT&T Bell Labs October 1989, 290 pages.

ABSTRACT

The Thailand nationwide network, which had close to 0.87 million subscribers in 1988 is expected to grow to about 4.2 million by 2005. Such a growth necessitates speedy modernization of the network in order to take advantage of the economies and new capabilities offered by modern technology. This presentation describes the final report of the toll Trunking Study.
The Thailand nationwide network is comprised of two interdependent networks: The Bangkok Metropolitan and the Thailand Provincial network. The Bangkok Metropolitan network has six digital tandems, which also perform toll functions. The toll network study therefore spans all of provincial Thailand and the Metropolitan Bangkok region, which

contains the six digital tandems. The basic structure of the toll network is a combination of star and mesh configurations.
The toll Trunking study was performed within the framework of an Integrated Toll Network Planning (ITNP) approach. The ITNP is an iterative approach involving Trunking, Switching and Transmission studies respectively.
The Trunking methodology is the task of designing cost efficient traffic network for transporting specified loads based on demands for telecommunications services. The traffic network specifies the communication point-to-point trunk requirements between pairs of switching entities. The communication paths on which calls are carried between the switches are trunks. The goal of the traffic network design, therefore, is to make certain that properly sized trunk groups are in proper locations in the network when they are needed to carry these calls with an acceptable service level at the least cost. The Trunking study is demonstrated by examining the seven alternative modernization studies proposed by the ITNP methodology.

17. *Augustine Samba, (*1989) *Systems Description for Enhanced Trunk Requirements for Inter-exchange Model (ETRIM) System***.** AT&T Bell Labs, January 1989, 57 pages.

ABSTRACT

This document provides a functional systems description of ETRIM, a traffic engineering software system presently used in the domestic and foreign markets.
The ETRIM is a network-planning tool, designed to engineer and optimize different hierarchical network topologies. ETRIM is designed and developed specifically to meet the increasingly growing needs for diverse network modernization studies. The tool is being used to perform Trunking analysis for a wide variety of AT&T customers.
The philosophy of ETRIM is conceptually simple: point-to-point traffic loads are progressively aggregated, using hierarchical routing rules, to a level sufficient to prove in a trunk group. If based on the routing rules, the trunk group is a High Usage (HU), the overflow traffic is computed, routed and combined with appropriate other point-to-point and overflow parcels. The Primary HU and Intermediate HU trunk groups are sized using the Economics CCS (ECCS) engineering methodology. The objective Grade of Service (GoS) criterion using the Erlang Blocking formulae is employed for sizing the Final trunk groups. The Equivalent Random method is used to model the overflow traffic.

INDUSTRY PRESENTATIONS

Note: *During my tenure in Industry, I made numerous technical presentations for solving a wide variety of problems in wireless and wireline telecommunications / communications systems, operations, management, infrastructures and services. Below are select presentations authored and delivered by Gus at forums, conferences, domestic and foreign corporations*

1. *Augustine Samba (2003), End-to-End Communications Infrastructure for Real-Time Clinical Trial Operations, Administration and Management. Proceedings of the Science of Real-Time Data Capture: Self-reports in Health Research Conference. Sponsored by National Cancer Institute, Charleston SC, September 5 -7, 2003*

   ABSTRACT

A Clinical Trial is a research study to answer specific questions about new therapies or new ways of using established treatments. This paper describes the end-to-end communications infrastructure and architectural elements that are needed to facilitate efficient real-time clinical trial Operations, Administration and Management

2. *Augustine Samba, (July17, 2002) Wireless Networks and Wireless Standards. The North East Ohio Software Association (NEOSA) Technical forum. Cleveland, OH*

ABSTRACT

The technology behind wireless communications is fascinating. This presentation focuses on the concept of cellular communications, and provides an overview of wireless networking standards in support of high-speed packets for efficient delivery of voice, video and multimedia content.

3. *Augustine Samba, (2001). The QuikCAT Access Network Architecture. Presented to The Chief Scientist, FBI Headquarters, Washington, DC, May 16, 2001*

4. *Augustine Samba, (1999) Lucent Intelligent Network Line Information Database (LIDB) Overview, Presented to Lucent Tier-1 and BellSouth Operations Management, June 2, 1999*

ABSTRACT

The LIDB is a large Database of 30 to 75 million records for subscriber line information and Special Billing Numbers (for example, Calling Card Numbers) accessible via SS7 networks. When a Network Element (NE) with Signaling System-7 (SS7) query capability recognizes a call requiring access to information in the LIDB, it queries the LIDB Service Control Point (SCP) system. The LIDB application responds with instructions for processing the call to completion.
In the current offering to BellSouth, Lucent is required to provide the LIDB services on the same SCP that BellSouth is running the Local Toll Free (LTF) Service Package Application (SPA). The Advantage Model 2 SCP will provide the platform for the combined LIDB/LTF configuration. The LTF application is not an integral part of the LIDB offering. However, overload conditions on LTF may lead to performance degradation of the LIDB service.

5. *A. Samba and* Anthony Lui*, (*1999) *Migrating your OSS to an Integrated Network*. Proceedings of The Institute for International Research conference on Integrating Voice, Video and Data in One Network. San Francisco, CA. March 26 -29, 1999

ABSTRACT

We propose an Operations Support Systems platform architecture designed to efficiently manage voice, video and data network. WE examine the characteristics of voice and data traffic and present the Integrated Network architecture for transporting multimedia traffic.

The values, challenges and criteria of the Operations Support System to successfully manage the Integrated Network are discussed.

6. *Augustine Samba, (*1998) *Retrofit Strategies for Ameritech Local Number Portability Service Management Systems at the Ameritech SIL and ELGIN Sites.*
   Ameritech Intelligent Network Division, Ameritech, Schaumburg, IL. November 17, 1998

ABSTRACT

This presentation discuses engineering procedures designed to flawlessly migrate, in real-time, live LNP subscriber profiles held in an in-service SMS located in the Ameritech SIL and ELGIN, while ensuring (a) Interoperability with independent Upstream and Downstream Systems at remote sites in NJ, IL and OH, (b) Synchronization of the managed objects across the regional Managed Information databases (MIB) and (c) un-interruption of subscriber telephone services

7. *Augustine Samba, (*1998) *Service Management System (SMS) Local Number Portability (LNP) and Live LNP Demo.*

Presented to Management of PrimeCo Personal Communications at the Lucent Technologies Feature Interactive Verification Facility Environment (FIVE), Naperville, IL, September 3, 1998

ABSTRACT

This talk was followed by a live demo. The presentation covers the SMS architecture for LNP, the communication protocols with upstream systems (NPAC and SOA) for provisioning the SMS; and downstream Network Elements, such as SCP for configuring Location Routing Number attributes and subscriber profiles. The demo environment consisted of a live 5ESS switch and the SCP in Naperville, Illinois; the SMS and NPAC simulator in Columbus, OH and Wide Area Network (WAN) interconnecting the different sites.

8. *Augustine Samba, (1998) Method of Procedure (MOP) for retrofitting and migrating live wireless subscriber records from SMS in Tulsa, OK to a remote site SMS in Clinton, MS without wireless service interruptions. Presented to MCI WorldCom, Clinton, MS. July 9, 1998*

   ABSTRACT

This presentation describes a novel algorithm designed to flawlessly migrate in real-time, live wireless subscriber profiles held in an in-service SMS located in Tulsa, OK to a new feature-rich SMS to be installed in Clinton, MO without disrupting telephone services of MCI WorldCom wireless subscribers calls. This algorithm is the first in the history of Lucent Technology Intelligent Networking that provides a comprehensive set of engineering procedures to facilitate retrofitting and migration in real-time without downtime or service interruptions.

9. *Augustine Samba, (*1998) *Seminar on SMS and LNP*. Presented to a team of Operations Managers from Frontier Wireless. Columbus, OH. August 17, 1998

ABSTRACT

This seminar was a training class for Wireless Operations Managers. The tutorial covered SMS architecture, LNP Operational scenarios and Communication Protocols amongst specific Network Elements deployed in the Intelligent Network environment. The seminar was videotaped and has been used as a training tool for other Wireless Operators.

10. *Augustine Samba, (*1998) Overview of SMS Provisioning, Advanced Toll Free, Flexible Network Routing, and Local Number Portability features in the Intelligent Network. Grand Rapids, MI. December 3, 1998

    ABSTRACT

    This presentation focused on the architecture, operational scenarios and communication protocols for Advanced Toll Free ("800 number"), Flexible Network Routing and Local Number Portability

11. *Augustine Samba, (*1997) *Service Management System in Wireless Intelligent Network.* Presented to Sprint PCS Management in Kansas City MO, December 3, 1997

ABSTRACT

This presentation described the wireless intelligent network; SMS provisioning and interoperability with various wireless network elements: The Stand-Alone Home Location Register (SHLR), The Authentication Center (AC) and the Wireless Service Control Point (WSCP).

12. *Augustine Samba, (*1997) *Sprint PCS Wireless Number Portability (WNP) and Live Demo- Lucent Technologies Solution: WNP SMS*. Presented to Management of Sprint PCS at the Lucent Technologies Feature Interactive Verification Facility Environment (FIVE), Naperville, IL, September 14, 1997

    ABSTRACT

This presentation focused on the SMS architecture for LNP, the communication protocols with upstream systems, such as the Number Portability Administration Center (NPAC) system and the Service Order Administration (SOA) system for provisioning the SMS; and downstream Network Elements, such SCP for configuring Location Routing Number attributes and subscriber profiles. The demo environment consisted of a live 5ESS switch and the SCP in Naperville, IL; the SMS and NPAC simulator in Columbus, OH and a WAN interconnecting the different sites.

13. *Augustine Samba, (*1997) *ANS Service Management System Overview.* Presented to Management of MCImetro in Roseville, CA July 28, 1997

ABSTRACT

I discussed the SMS architecture for administering and provisioning Network Elements in the Intelligent Network, The Managed Information Base (MIB,) Inter-process communications, external communication protocols (CMIP/CMISE) with upstream systems (NPAC and SOA) for provisioning the SMS; and downstream Network Elements, such as Service Control Point (SCP) for configuring Location Routing Number attributes and subscriber profiles

14. *Augustine Samba, (*1997) *ANS Service Management System and LNP Overview.* Presented to AGCS, Phoenix, AZ. March 11, 1997

ABSTRACT

This talk focused on an end-to-end architecture of the SMS, emphasizing the external interfaces such as the Q3 TMN protocols within the Intelligent Network environment. The goal is to facilitate seamless interoperability of the AGCS Service Order Administration (SOA) with the Lucent Advanced Network Service SMS

15. *Augustine Samba, (*1995). *The Automatic Re-Route Algorithm (ARA).* Presented to Management of Telecom Italia in Italy. Francesco Longo of ITALTEL translated this presentation to Italian. March 24, 1995

ABSTRACT

The ARA is a novel adaptive routing algorithm, which I created in response to traffic congestion problems in the Telecom Italia network. The ARA detects network overload and facility failures in real-time, and determines the least loaded two-link paths for re routing traffic around congested or failed facilities. It recommends or specifies controls to utilize the least loaded two link paths. The advantages of ARA extend beyond heterogeneous and the primary network.

16. *Augustine Samba, (*1989) *Toll Trunking study for the Nationwide-switched Network of Thailand. Bangkok Thailand. October 1989*

ABSTARCT

This hour-long presentation was given to management at the Telephone Organization of Thailand (TOT) in Bangkok Thailand. The Thailand nationwide network, which had close to 0.87 million subscribers in 1988 was expected to grow to about 4.2 million by 2005. Such a growth necessitated speedy modernization of the network in order to take advantage of the economies and new capabilities offered by modern technology. This presentation described the final report of the toll Trunking Study**.**

PATENT AWARDS

US Patent Awards (USPTO)

- US 5,539,815A: Network Call Routing Controlled by a Management Node, July 23, 1996, Augustine S. Samba

  Summary:
  In a telecommunications network having a plurality of switches interconnected by groups of communication channels, each switch periodically generating traffic data indicative of the volume of calls on the respective groups of the communications channel, a method for automatically selecting a routing path for calls from an originating switch via an intermediate switch to a destination switch.

- US 6,289,095 B1: NPA Split Management in Intelligent Network Environment, September 11, 2001, Augustine Sylvester Samba, Anthony Buttitta

Summary

An NPA split management system and associated methods for receiving from a user descriptive instructions regarding upcoming NPA split, and responsively updating components of the Intelligent Network (IN) to reflect changes in the NPA codes assigned to Wireless and Wire-line IN services, subscribers.

A Service Management System user interface allows the user to declare an NPA spilt and define its characteristics. The SMS contains indicia corresponding to SMS-managed object databases. The SMS transmits instructions to each affected Network Element (NE) to update the databases.

During the PDP affected NEs translate references to the old NPA before providing the requested telecommunications service.

- US 2002/0196793 A1, **End-User Communication Systems Access Network**, December 26, 2002, Augustine Samba, Atila Boros, Olu E. Lafe (Patent Pending)

Summary

A data communication system, which facilitates integration of both wireless and wired communication devices with core backbone and service provider networks. The data communication system includes a sub-network, which provides enhanced data transport and managed IP services for Service Providers. Managed IP servers process data at the IP layer, and perform encryption, decryption, compression, and decompression functions, thus enabling the provision of content-based services to end-users.

- **US Patent No.8,868,725 B2 "APPARATUS AND METHODS FOR REAL-TIME MULTIMEDIA NETWORK TRAFFIC MANAGEMENT & CONTROL IN WIRELESS NETWORKS", Augustine S. Samba, October 21, 2014**

CANADIAN Patent Awards (CIPO)

- CA 2167862 Network Routing Controlled by a Management Node Call, September 28, 1999, Augustine Sylvester Samba

- CA 2280102, **NPA Split Management in Intelligent Network Environment**, July16, 2002, Augustine Sylvester Samba, Anthony Buttitta

EUROPEAN PATENT (Britain, France, Germany) Patent Award (EPO, Hague)

EP1005238 B1: **NPA Split Management in Intelligent Network Environment**, October 24, 2001 Augustine Sylvester Samba, Anthony Buttitta

JAPAN Patent Award (JPO)

JP2000115359 "NPA Division Management in Intelligent Network Environment", Augustine Sylvester Samba, Anthony Buttitta

Korean Patent Award

KR2000028730, **DIVIDED MANAGEMENT OF NPA IN INTELLIGENT NETWORK ENVIRONMENT**