

## OpenSS7 Session Border Controller High-Level Design



# OpenSS7 Session Border Controller

## High-Level Design

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### **Abstract:**

This document provides a High-Level Design for the OpenSS7 Session Border Controller.

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The OpenSS7 Project <<http://www.openss7.org/>>

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## Executive Overview

This document provides a High-Level Design for the OpenSS7 Session Border Controller. The initial and primary purposes of this equipment is to provide a scalable, carrier-grade platform for interconnecting VoIP backbone networks to the PSTN using SS7.

### The OpenSS7 Project

The [OpenSS7 Project](#) is an open source software project that has developed many protocol components within the SS7, SIGTRAN, ISDN and VoIP protocol stacks. Intellectual property rights for the OpenSS7 Project are held by [OpenSS7 Corporation](#). All OpenSS7 Project software is eventually licensed under the GNU Affero General Public License Version 3. OpenSS7 Corporation also provide commercial licensing of OpenSS7 Project software under terms less restrictive than the AGPL.

### The OpenSS7 Carrier VoIP Switch

OpenSS7 can provide VoIP gateway capabilities in a high-performance, low-cost, small-footprint platform leveraging the GNU/Linux operating system distributions and tools, and utilizing low-cost commodity, or high-quality standardized hardware.

For details on platform applications, see [Chapter 2 \[Application Architecture\]](#), page 9, [Chapter 3 \[Network Architecture\]](#), page 11, [Appendix A \[Optional Application Support\]](#), page 27, and [Appendix B \[Optional Network Support\]](#), page 29.

### Open Source Software

The OpenSS7 Project leverages the widespread use of GNU/Linux operation systems, distributions, and FSF tools such as ‘`autoconf`’ and *RPM*. For example, this document was formatted for PDF, HTML, info and plain text using the GNU *texinfo* system, ‘`autoconf`’, and the  $\text{\TeX}$  formatting system.

The open source model avoids proprietary lock-in and permits in-house or outsourced development. All source code is available for use and modification by the end customer. All build tools, documentation and associated resources are generally available. The availability of the source code and complete documentation eases problem resolution and can offer upgrades and fixes even in advance of client problem reports.

For details on software solutions, see [Chapter 7 \[Protocol Architecture\]](#), page 19, [Chapter 8 \[Software Architecture\]](#), page 21, [Appendix C \[Optional Protocol Support\]](#), page 31, and [Appendix D \[Optional Software Support\]](#), page 33.

### Commodity Hardware

By best utilizing commodity PC or standardized CompactPCI hardware, OpenSS7 makes available the highest performance platforms available on the market at back-to-school prices. When carrier-grade and large scale is not essential, 3GHz Pentium class servers in hardened rack mount chassis can be used at a fraction of the cost, and yet outperform, other solutions. Where carrier-grade is necessary, embedded Linux on standardized PICMG 2.16 NEBS compliant chassis make for a higher cost, but more reliable alternative.

For details on hardware solutions, see [Chapter 6 \[Platform Architecture\]](#), page 17, [Chapter 9 \[Hardware Architecture\]](#), page 23, and [Appendix E \[Optional Hardware Support\]](#), page 35.

### Rapid Development

The OpenSS7 Project has already developed protocol components completing the SS7 and SIGTRAN signalling stacks including MTP Level 2 and Level 3, ISUP, SCCP, TCAP; and SCTP, M2PA, M2UA,

M3UA, SUA and TUA. Development of a Carrier VoIP Switch to meet initial field requirements needs only the development of some intermediate and auxiliary modules.

For details on scheduling, see [Chapter 10 \[Logistics\]](#), page 25.

### **An Evolving Solution**

The OpenSS7 Project is evolving to support more protocol stacks including ISDN and VoIP. Support for an ever expanding capability is demonstrated by the additional options available as described in [Appendix A \[Optional Application Support\]](#), page 27, [Appendix B \[Optional Network Support\]](#), page 29, [Appendix C \[Optional Protocol Support\]](#), page 31, [Appendix D \[Optional Software Support\]](#), page 33, and [Appendix E \[Optional Hardware Support\]](#), page 35.

### **Conclusions**

In summary, an OpenSS7 Carrier VoIP Switch an excellent application of the OpenSS7 SS7 and VoIP stacks and can be provided at a affordable price on short time-lines, while offering an evolution path for future deployment applications.

Brian Bidulock  
The OpenSS7 Project

# Preface

## Document Information

### Abstract

This document provides High-Level Design for the OpenSS7 Session Border Controller.

### Objective

The objective of this document is to provide Application Notes for the development of a low cost, high-performance, OpenSS7 Session Border Controller using OpenSS7 protocol components, software, and compatible systems and hardware.

### Intent

The intent of this document is to act as a High-Level Design for an project for an High-Level Design. As a High-Level Design, this document discusses components and systems which are not necessarily complete. [OpenSS7 Corporation](#) is under no obligation to provide any software, system or feature listed herein.

### Audience

This document is intended for a technical audience. The reaser should be familiar with most most ETSI, ITU-T and ANSI, Signalling System No. 7 recommendations, H.323, H.225, H.245, as well as IETF drafts and RFCS for RTP, SIP, SIP-T, MEGACO, MGCP, and SIGTRAN protocols.

### Revisions

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```
$Log: sbc.texi,v $  
Revision 1.1.2.1 2009-06-21 10:47:35 brian  
- added files to new distro
```

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## Document Organization

This document is organized as follows:

*Chapter 1 [Introduction], page 7*

Introduction to the OpenSS7 Session Border Controller application.

*Chapter 2 [Application Architecture], page 9*

The application requirements and architecture.

*Chapter 3 [Network Architecture], page 11*

The network architecture for the application.

*Chapter 4 [Reference Architecture], page 13*

The reference architecture for the application.

*Chapter 5 [System Architecture], page 15*

The architecture of the OpenSS7 Session Border Controller system.

*Chapter 6 [Platform Architecture], page 17*

The architecture of the OpenSS7 Session Border Controller platform.

*Chapter 7 [Protocol Architecture], page 19*

The protocol architecture supporting the application.

*Chapter 8 [Software Architecture], page 21*

The software architecture supporting the protocol stack and application.

*Chapter 9 [Hardware Architecture], page 23*

The hardware architecture supporting the protocol stack and application.

*Chapter 10 [Logistics], page 25*

Project logistics for completion of the VoIP GW application.

*Appendix A [Optional Application Support], page 27*

Additional application support not directly contributing to the current objective.

*Appendix B [Optional Network Support], page 29*

Additional network interface support not directly contributing to the current objective.

*Appendix C [Optional Protocol Support], page 31*

Additional protocol component support not directly contributing to the current objective.

*Appendix D [Optional Software Support], page 33*

Additional software support not directly contributing to the current objective.

*Appendix E [Optional Hardware Support], page 35*

Additional hardware support not directly contributing to the current objective.

*Appendix F [Programmatic Interfaces], page 37*

Programmatic interfaces to selected protocol components.

*Appendix G [Platform Sizing], page 39*

Detailed platform sizing considerations.

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Index of concepts.



# 1 Introduction



## 2 Application Architecture



### **3 Network Architecture**



## 4 Reference Architecture



## 5 System Architecture



## 6 Platform Architecture



## 7 Protocol Architecture



## 8 Software Architecture



## 9 Hardware Architecture



## 10 Logistics



## **Appendix A Optional Application Support**



## **Appendix B Optional Network Support**



## Appendix C Optional Protocol Support



## Appendix D Optional Software Support



## Appendix E Optional Hardware Support



## Appendix F Programmatic Interfaces



## Appendix G Platform Sizing



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