Network Working Group
INTERNET-DRAFT

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Multiple Signalling Gateway Support
for
Signalling User Adaptation Layers
<draft-bidulock-sigtran-multisg-04.ps>

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Abstract

This Internet-Draft describes **Load Selection** for Signalling User Adaptation Protocols [M3UA-BIS, SUA..TUA], which permits an Application Server Processes (ASP) to indicate its placement within an Application Server and permits an Signalling Gateway (SG) to distribute traffic over ASPs in Application Servers under Application Server Process (ASP) control.

Contents

A complete table of contents, list of tables and illustrations, and change history appears at the end of this document.

1. Introduction

1.1. Scope

This Internet-Draft provides parameters and procedures in extension to the parameters and procedures of the Signalling User Adaptation Layers (UAs) [M3UA-BIS, SUA..TUA], for the purpose of supporting Application Servers interworking with multiple Signalling Gateways to the SS7 Network.

UA implementations with **Multiple SG Support** are intended to be compatible with UA implementations not supporting this configuration.

MULTI-SG is only applicable to Signalling Gateway (SG)-Application Server Process (ASP) configurations in which ASP are supporting Application Server (AS) connectivity to an SS7 network via multiple SGs.[1] **MULTI-SG** is not applicable to configurations of IPSPs working in a point-to-point network without relay

points.[2]

1.2. Terminology

Multiple SG Support (MULTI-SG) supplements the terminology used in the UA documents [M3UA-BIS, SUA..TUA] by adding the following terms:

Multiple SG Support (MULTI-SG) – the parameters and procedures provided in this document.

Signalling User Adaptation Layer (UA) – one or more of the Stream Control Transmission Protocol (SCTP) [RFC 2960] SS7 Signalling User Adaptation Layers [M3UA-BIS, SUA..TUA] supporting the concept of a *Routing Context*.

1.3. Overview

MULTI-SG provides procedures in addition to the UA procedures[3] that provides for seamless interworking of SS7 Network Management with Application Server Processes (ASPs) supporting Application Servers (AS) to multiple Signalling Gateways (SGs). **MULTI-SG** procedures provide support for the following functions not provided for in the existing UA documents:

- Support for fail-over of SCTP associations between Signalling Gateways (SGs).
- Support for rerouting of traffic destined to Signalling Endpoints (SEP) in SS7 Network between Signalling Gateways (SGs).
- Support for seamless interworking with SS7 Changeback [Q.704] procedures towards the SS7 Network for rerouting of traffic between SGs for elminating message mis-sequencing across the interworking point between the SS7 and IP networks.

MUTLI-SG supplements the procedures for the diversion of traffic during fail-over or restoration of ASPs, SGPs and IPSPs already provided for in *"Correlation Id and Heartbeat Procedures (CORID) Supporting Lossless Fail-Over between SCTP Associations"* [CORID]. The benefits of **MULTI-SG** can, nevertheless, be supported indepedent from **CORID** [CORID]

1.3.1. Multiple SGs

No procedures are described which provide for reduction of message loss, duplication or mis-sequencing in multiple SG configurations in the existing UA procedures.

1.3.1.1. Fail-over of routesets between SGs

1.3.1.2. Redirection of routesets between SGs

1.4. Sample Configurations

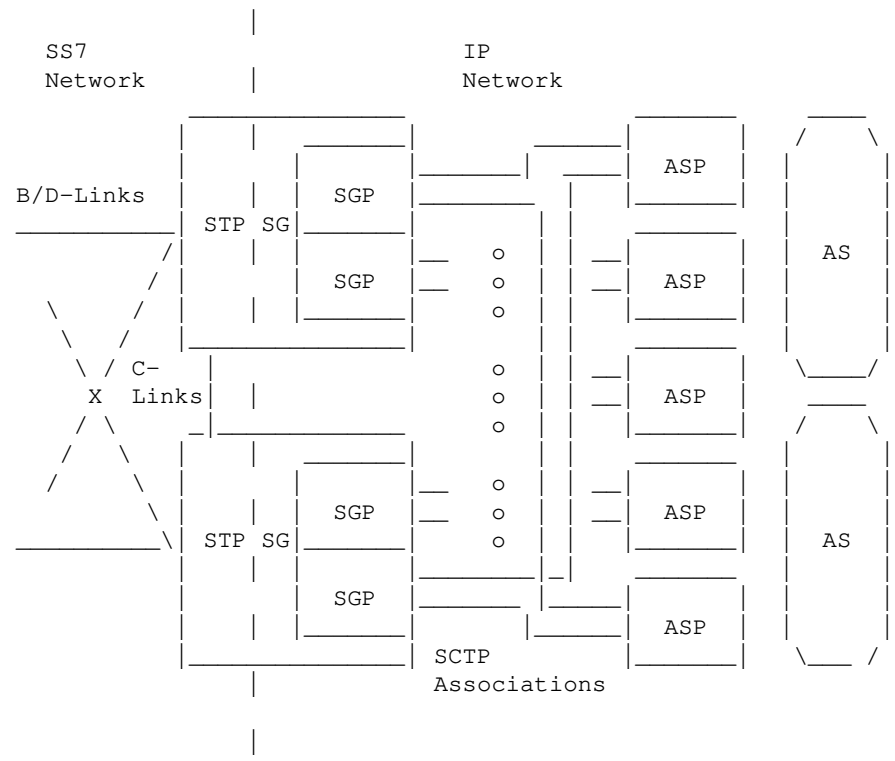

Figure 1. Example (A) Sample Multiple-SG Configuration

A typical Example (A) configuration multiple Signalling Gateways is illustrated in *Figure 1*. In this configuration a number of Application Server Processes (ASPs) serving a number of Application Servers (ASs) are connected to two Signalling Gateways (SGs). The SGs appear as mated SS7 Signalling Transfer Points (STPs) [Q.705] to the SS7 Network. Traffic originating at Signalling Endpoints (SEP) in the SS7 network and directed toward SEP in the IP network (i.e., Application Servers) is loadshared over the STPs by the Signalling Link Selection (SLS) [Q.704] value associated with each message. Traffic originating at the SEP in the IP network (i.e, AS) is loadshared over the SGs in the same fashion.

Notes for §1

[1] This is commonly referred to within the SIGTRAN WG as the "backhaul" case.

[2] This is commonly referred to within the SIGTRAN WG as the "peer-to-peer" case.

[3] See Section 4 of M3UA, SUA and TUA [M3UA-BIS, SUA..TUA].

2. Conventions

The keywords "**MUST**", "**MUST NOT**", "**REQUIRED**", "**SHALL**", "**SHALL NOT**", "**SHOULD**", "**SHOULD NOT**", "**RECOMMENDED**", "**NOT RECOMMENDED**", "**MAY**", and "**OPTIONAL**", when they appear in this document, are to be interpreted as described in [RFC 2119].

3. Protocol Elements

3.1. Parameters

3.2. Messages

4. Procedures

4.1. AS and ASP State Maintenance

4.1.1. ASP State

4.1.2. AS State

4.1.3. ASP Up Procedures

4.1.4. ASP Down Procedures

4.1.5. ASP Active Procedures

4.1.6. ASP Inactive Procedures

4.1.7. Notify Procedures

5. Examples

6. Security

Load Selection does not introduce any new security risks or considerations that are not already inherent in the UA [M3UA-BIS, SUA..TUA] Please see the SIGTRAN Security document [SIGSEC] for security considerations and recommendations that are applicable to each of these UAs.

7. IANA Considerations

0. Change History

This section will be deleted once this memo is finalized.

0.4. Changes from Version 0.3 to Version 0.4

0.3. Changes from Version 0.2 to Version 0.3

0.2. Changes from Version 0.1 to Version 0.2

0.1. Changes from Version 0.0 to Version 0.1

R. References

R.1. Normative References

[**RFC 2119**] Bradner, S., *"Key words for use in RFCs to Indicate Requirement Levels,"* **RFC 2119 - BCP 14**, The Internet Society (March 1997).

[**M3UA-BIS**] Pastor, J., Morneault, K., *"Signaling System 7 (SS7) Message Transfer Part 3 (MTP3)-User Adaptation Layer (M3UA),"* **<draft-ietf-sigtran-rfc3332bis-05.txt>**, Internet Engineering Task Force - Signalling Transport Working Group (October 2005). *Work In Progress*

[**RFC 2960**] Stewart, R., Xie, Q., Morneault, K., Sharp, C., Schwarzbauer, H. J., Taylor, T., Rytina, I., Kalla, H., Zhang, L. and Paxson, V., *"Stream Control Transmission Protocol (SCTP),"* **RFC 2960**, The Internet Society (February 2000).

[**SIGSEC**] Loughney, J., Tuexen, M. and Pastor-Balbas, J., *"Security Considerations for Signaling Transport (SIGTRAN) Protocols,"* **RFC 3788**, Internet Engineering Task Force - Signalling Transport Working Group (June 2004).

R.2. Informative References

[**SUA**] Loughney, J., Sidebottom, G., Coene, L., Verwimp, G., Keller, J. and Bidulock, B., *"Signalling Connection Control Part User Adaptation Layer (SUA),"* **RFC 3868**, Internet Engineering Task Force - Signalling Transport Working Group (October, 2004).

[**ISUA**] Bidulock, B., *"SS7 ISUP-User Adaptation Layer (ISUA),"* **<draft-bidulock-sigtran-isua-03.txt>**, Internet Engineering Task Force - Signalling Transport Working Group (October 16, 2005). *Work In Progress.*

[**TUA**] Bidulock, B., *"SS7 TCAP-User Adaptation Layer (TUA),"* **<draft-bidulock-sigtran-tua-04.txt>**, Internet Engineering Task Force - Signalling Transport Working Group (October 16, 2005). *Work In Progress.*

[**Q.704**] ITU, *"Message Transfer Part – Signalling Network Functions and Messages,"* **ITU-T Recommendation Q.704**, ITU-T Telecommunication Standardization Sector of ITU, Geneva (March 1993). *(Previously "CCITT Recommendation")*

[**CORID**] Bidulock, B., *"Correlation Id and Heartbeat Procedures Supporting Lossless Fail-Over,"* **<draft-bidulock-sigtran-corid-04.txt>**, Internet Engineering Task Force - Signalling Transport Working Group (October 16, 2005). *Work In Progress.*

[**Q.705**] ITU, *"Signalling System No. 7 – Signalling Network Structure,"* **ITU-T Recommendation Q.705**, ITU-T Telecommunication Standardization Sector of ITU, Geneva (March 1993). *(Previously "CCITT Recommendation")*

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