Acme Packet Interoperability Application Note

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Document Revision

This section contains an update history, reviewers, approvers, and acknowledgements.

Revision

Author	Comments	Creation/Amendment Date	Version
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Table of Contents

INTRODUCTION 3

INTEROPERABILITY DETAILS 4

NETWORK DIAGRAM 4
ACCESS ENVIRONMENT WITH DEVICES BEHIND A NAT ROUTER 5
HARDWARE AND SOFTWARE REQUIREMENTS 5
TEST PLAN EXECUTION 5
KNOWN ISSUES 6

ACME PACKET CONFIGURATION 7

3RD PARTY CONFIGURATION 8

REFERENCES 9

APPENDIX A 10

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Introduction

This Application Note describes the configuration of a Session Director used to send TCP media between peers that are behind NATs. Peers are based on Blink version 0.19.0.

The Application Note's primary focus is to verify the MSRP interoperability and functionality of the Session Director when interoperating with Blink SIP clients.

MSRP is a text-based, connection-oriented protocol for exchanging arbitrary MIME content. Sessions are set up via Session Initiation Protocol.

The environment used in the testing is based on MSRP peer-to-peer mode. SD is required to establish the TCP connection with each endpoint in passive mode to traverse NATs and stitch the two connections after successful setup.

The devices under test (DUT) are Blink SIP Clients version 0.19.0.

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Interoperability Details

It is assumed within this Application Note that the Session Director has been configured in accordance with published Acme Packet Best Practices documents. Connectivity should be established to all of the relevant test equipment (softswitch, 'untrusted' network, media gateways, etc.). It is important to make sure the Session Director is functioning without alarms or health degradation, and in a condition suitable for processing simulated carrier traffic.

Further, this Application Note assumes familiarity with the Session Director's ACLI command line interface, retrieving and reviewing log files generated by the Session Director. It is also necessary to have working knowledge of standard network analysis tools (Ethereal/tcpdump), and all protocols involved.

The scenario used during this IOT is based on the peer-to-peer mode where the SD may remain in the MSRP path utilizing the TCP stitching feature. TCP stitching is triggered when both the UAC and UAS initiate TCP SYN towards each other through the SD for the MSRP streams.

In this testing compatibility with these two specs has been verified:

- IETF connection model: draft-ietf-simple-msrp-acm-09
- IETF session matching: draft-ietf-simple-msrp-sessmatch-06

Network Diagram

The diagram below shows the access devices as the Device under Test (DUT) in the 'access' network. It was assumed within these network topologies that the core network is trusted. As the core network is trusted UDP is the chosen transport protocol. This would however change if the DUT used SIPS URI instead of a SIP URI.

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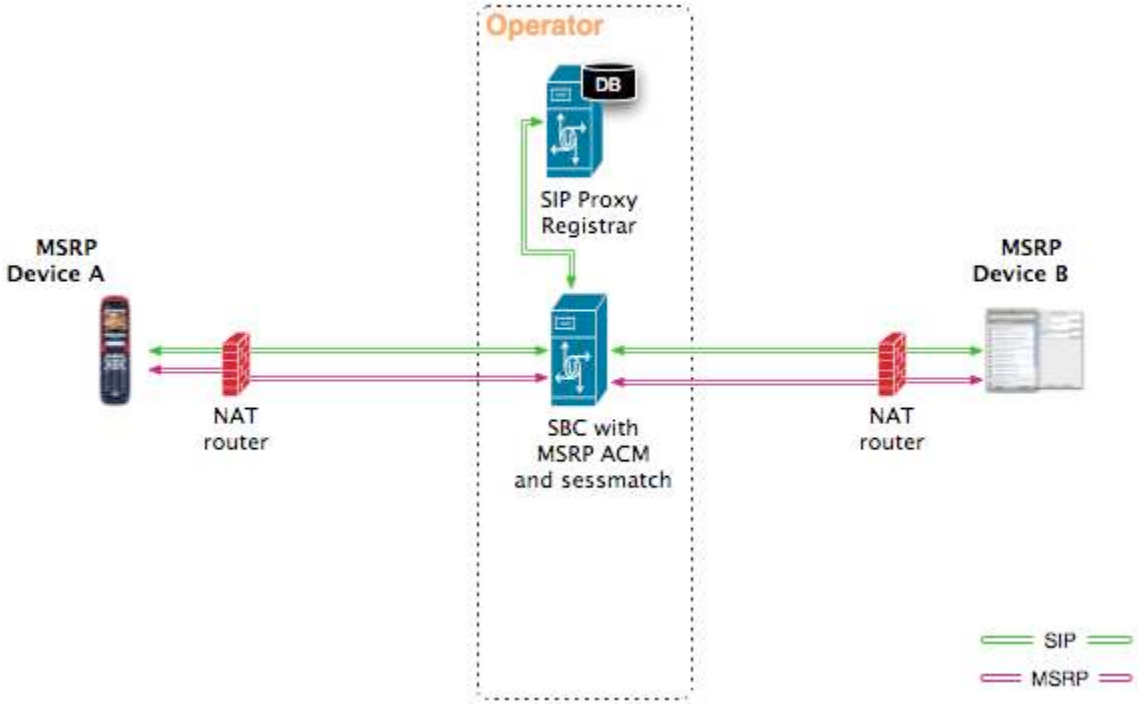
Access Environment with devices behind a NAT router



In this scenario the SIP Proxy Registrar doesn't alter c- and m- lines or a= attribute in SDP offer and answer in which case TCP stitching is triggered by the SD (SBC in the picture). TCP handshake and payload packets are relayed between the devices through the SD.

SD receives incoming SYNs on the local address and port provided in the SDP offer and answer to each endpoint, stitches the two TCP connections internally after successful establishment of both connections and relay MSRP stream between the devices.

The "stitching" makes both devices think they are talking to a server. To achieve this end, the SD caches SYNs from both sides so it can modify the SYN packets to SYN-Acks with the correct sequence and Ack numbers.

Hardware and Software Requirements

- One Net-Net 4500 Session Border Controller running nnSCX620m2 software with licenses for (at a minimum) SIP, Routing
- One SIP registrar/proxy
- One or two NAT Routers
- Two SIP clients that support MSRP.

Test Plan Execution

This test plan defines the tests to be performed for MSRP over SIP calls.

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The test plan primary focus is to verify a peer to peer scenario for MSRP calls between 2 SIP endpoints. This test plan is based on NAT access environment. This test plan assumes that MSRP protocol over SIP will be used for the call tests.

The tests are primarily focused on SIP signaling on MSRP chat messages and file transferring:

	Access Environment with devices behind a NAT router.	
TC1	**Instant Messaging**	PASSED
TC2	**File Transfer**	PASSED

Known Issues

No issues have been identified during the execution of this interoperability activity.

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Acme Packet Configuration

The Session Director configuration is based on BCP → 520-0005-04 BCP - SIP Access Configuration.pdf. In this test environment the phones used FQDNs, so no sip-nats where configured.

Due to DUT require to use the “a=path” line to determine connection information (they do not use the lines “c” and “m”) the SBC needs to implement a rule manipulation to re-write the “a=path” line with public IP address and port of the SBC. See details of the configuration of this HMR in the configuration in Annex A.

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3rd Party Configuration

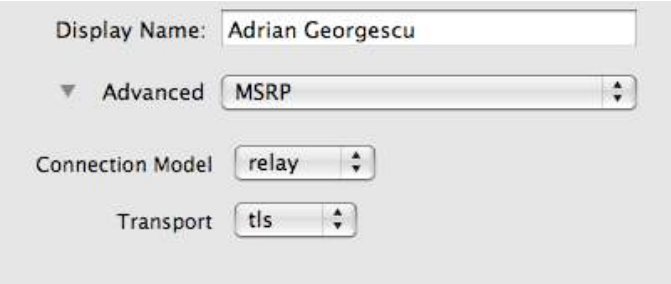
AG Projects DUT

Product Name: Blink

Product Version: 0.19.0

Contact information: http://ag-projects.com

DUT configuration:



In Advanced properties of the SIP account, MSRP section, change Connection model from relay to acm.

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References

1 Net-Net 4000 S-C6.2.0 ACLI Configuration Guide

2 BCP – Net-Net 4000 SIP Access Configuration

3 draft-ietf-simple-msrp-acm-09

4 draft-ietf-simple-msrp-sessmatch-06

5 RFC4975 “The Message Session Relay Protocol (MSRP)”

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Appendix A

Acme Packet SD testing related configuration printout:

```
system-config
        hostname
        description
        location
        mib-system-contact
        mib-system-name
        mib-system-location
        snmp-enabled                    enabled
        enable-snmp-auth-traps          disabled
        enable-snmp-syslog-notify       disabled
        enable-snmp-monitor-traps       disabled
        enable-env-monitor-traps        disabled
        snmp-syslog-his-table-length    1
        snmp-syslog-level               WARNING
        system-log-level                WARNING
        process-log-level               NOTICE
        process-log-ip-address          0.0.0.0
        process-log-port                0
        collect
                sample-interval                 5
                push-interval                   15
                boot-state                      disabled
                start-time                      now
                end-time                        never
                red-collect-state               disabled
                red-max-trans                   1000
                red-sync-start-time             5000
                red-sync-comp-time              1000
                push-success-trap-state         disabled
        call-trace                      disabled
        internal-trace                  disabled
        log-filter                      all
        default-gateway                 212.31.195.177
        restart                         enabled
        exceptions
        telnet-timeout                  0
        console-timeout                 0
        remote-control                  enabled
        cli-audit-trail                 enabled
        link-redundancy-state           disabled
        source-routing                  enabled
        cli-more                        disabled
        terminal-height                 24
        debug-timeout                   0
        trap-event-lifetime             0
        cleanup-time-of-day             00:00
        last-modified-by                admin@console
        last-modified-date              2010-06-23 11:28:12
```

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```
phy-interface
        name                            M11
        operation-type                  Media
        port                            1
        slot                            1
        virtual-mac
        admin-state                     enabled
        auto-negotiation                enabled
        duplex-mode                     FULL
        speed                           100
        overload-protection             disabled
        last-modified-by                admin@172.16.1.240
        last-modified-date              2009-09-29 06:32:10

network-interface
        name                            M11
        sub-port-id                     0
        description
        hostname
        ip-address                      212.31.195.181
        pri-utility-addr
        sec-utility-addr
        netmask                         255.255.255.240
        gateway                         212.31.195.177
        sec-gateway
        gw-heartbeat
                state                           disabled
                heartbeat                       0
                retry-count                     0
                retry-timeout                   1
                health-score                    0
        dns-ip-primary
        dns-ip-backup1
        dns-ip-backup2
        dns-domain
        dns-timeout                     11
        hip-ip-list                     212.31.195.181
        ftp-address
        icmp-address                    212.31.195.181
        snmp-address
        telnet-address
        ssh-address
        last-modified-by                admin@172.16.1.240
        last-modified-date              2009-09-29 06:34:32

sip-config
        state                           enabled
        operation-mode                  dialog
        dialog-transparency             enabled
        home-realm-id                   core
        egress-realm-id
        nat-mode                        None
        registrar-domain                *
        registrar-host                  *
        registrar-port                  5060
        register-service-route          always
        init-timer                      500
```

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```
        max-timer                       4000
        trans-expire                    32
        invite-expire                   180
        inactive-dynamic-conn           32
        enforcement-profile
        pac-method
        pac-interval                    10
        pac-strategy                    PropDist
        pac-load-weight                 1
        pac-session-weight              1
        pac-route-weight                1
        pac-callid-lifetime             600
        pac-user-lifetime               3600
        red-sip-port                    1988
        red-max-trans                   10000
        red-sync-start-time             5000
        red-sync-comp-time              1000
        add-reason-header               disabled
        sip-message-len                 4096
        enum-sag-match                  disabled
        extra-method-stats              disabled
        rph-feature                     disabled
        nsep-user-sessions-rate         0
        nsep-sa-sessions-rate           0
        registration-cache-limit        0
        register-use-to-for-lp          disabled
        options                         max-udp-length=0
        refer-src-routing               disabled
        add-ucid-header                 disabled
        proxy-sub-events
        pass-gruu-contact               disabled
        sag-lookup-on-redirect          disabled
        last-modified-by                admin@172.16.1.240
        last-modified-date              2009-08-03 11:45:53


media-manager
        state                           enabled
        latching                        enabled
        flow-time-limit                 86400
        initial-guard-timer             300
        subsq-guard-timer               300
        tcp-flow-time-limit             86400
        tcp-initial-guard-timer         300
        tcp-subsq-guard-timer           300
        tcp-number-of-ports-per-flow    2
        hnt-rtcp                        disabled
        algd-log-level                  NOTICE
        mbcd-log-level                  NOTICE
        red-flow-port                   1985
        red-mgcp-port                   1986
        red-max-trans                   10000
        red-sync-start-time             5000
        red-sync-comp-time              1000
        media-policing                  enabled
        max-signaling-bandwidth         10000000
        max-untrusted-signaling         100
```

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```
            min-untrusted-signaling        30
            app-signaling-bandwidth        0
            tolerance-window               30
            rtcp-rate-limit                0
            trap-on-demote-to-deny         enabled
            min-media-allocation           32000
            min-trusted-allocation         60000
            deny-allocation                32000
            anonymous-sdp                  disabled
            arp-msg-bandwidth              32000
            fragment-msg-bandwidth         0
            rfc2833-timestamp              disabled
            default-2833-duration          100
            rfc2833-end-pkts-only-for-non-sig enabled
            translate-non-rfc2833-event    disabled
            media-supervision-traps        disabled
            dnsalg-server-failover         disabled
            last-modified-by               admin@172.16.1.240
            last-modified-date             2009-08-03 11:50:27


realm-config
            identifier                     access_internet
            description
            addr-prefix                    0.0.0.0
            network-interfaces
                                           M11:0
            mm-in-realm                    enabled
            mm-in-network                  enabled
            mm-same-ip                     enabled
            mm-in-system                   enabled
            bw-cac-non-mm                  disabled
            msm-release                    disabled
            qos-enable                     disabled
            generate-UDP-checksum          disabled
            max-bandwidth                  0
            fallback-bandwidth             0
            max-priority-bandwidth         0
            max-latency                    0
            max-jitter                     0
            max-packet-loss                0
            observ-window-size             0
            parent-realm
            dns-realm
            media-policy
            media-sec-policy
            in-translationid
            out-translationid
            in-manipulationid
            out-manipulationid             msrp
            manipulation-string
            manipulation-pattern
            class-profile
            average-rate-limit             0
            access-control-trust-level     none
            invalid-signal-threshold       0
            maximum-signal-threshold       0
```

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```
        untrusted-signal-threshold      0
        nat-trust-threshold             0
        deny-period                     30
        ext-policy-svr
        symmetric-latching              enabled
        pai-strip                       disabled
        trunk-context
        early-media-allow
        enforcement-profile
        additional-prefixes
        restricted-latching             none
        restriction-mask                32
        accounting-enable               enabled
        user-cac-mode                   none
        user-cac-bandwidth              0
        user-cac-sessions               0
        icmp-detect-multiplier          0
        icmp-advertisement-interval     0
        icmp-target-ip
        monthly-minutes                 0
        net-management-control          disabled
        delay-media-update              disabled
        refer-call-transfer             disabled
        dyn-refer-term                  disabled
        codec-policy
        codec-manip-in-realm            disabled
        constraint-name
        call-recording-server-id
        xnq-state                       xnq-unknown
        hairpin-id                      0
        stun-enable                     disabled
        stun-server-ip                  0.0.0.0
        stun-server-port                3478
        stun-changed-ip                 0.0.0.0
        stun-changed-port               3479
        match-media-profiles
        qos-constraint
        sip-profile
        sip-isup-profile
        block-rtcp                      disabled
        hide-egress-media-update        disabled
        last-modified-by                admin@192.168.1.159
        last-modified-date              2010-06-18 10:36:10
realm-config
        identifier                      sipserver_internet
        description
        addr-prefix                     0.0.0.0
        network-interfaces
                                        M11:0
        mm-in-realm                     enabled
        mm-in-network                   enabled
        mm-same-ip                      enabled
        mm-in-system                    enabled
        bw-cac-non-mm                   disabled
        msm-release                     disabled
        qos-enable                      disabled
        generate-UDP-checksum           disabled
```

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```
max-bandwidth                   0
fallback-bandwidth              0
max-priority-bandwidth          0
max-latency                     0
max-jitter                      0
max-packet-loss                 0
observ-window-size              0
parent-realm
dns-realm
media-policy
media-sec-policy
in-translationid
out-translationid
in-manipulationid
out-manipulationid
manipulation-string
manipulation-pattern
class-profile
average-rate-limit              0
access-control-trust-level      none
invalid-signal-threshold        0
maximum-signal-threshold        0
untrusted-signal-threshold      0
nat-trust-threshold             0
deny-period                     30
ext-policy-svr
symmetric-latching              disabled
pai-strip                       disabled
trunk-context
early-media-allow
enforcement-profile
additional-prefixes
restricted-latching             none
restriction-mask                32
accounting-enable               enabled
user-cac-mode                   none
user-cac-bandwidth              0
user-cac-sessions               0
icmp-detect-multiplier          0
icmp-advertisement-interval     0
icmp-target-ip
monthly-minutes                 0
net-management-control          disabled
delay-media-update              disabled
refer-call-transfer             disabled
dyn-refer-term                  disabled
codec-policy
codec-manip-in-realm            disabled
constraint-name
call-recording-server-id
xnq-state                       xnq-unknown
hairpin-id                      0
stun-enable                     disabled
stun-server-ip                  0.0.0.0
stun-server-port                3478
stun-changed-ip                 0.0.0.0
stun-changed-port               3479
```

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```
            match-media-profiles
            qos-constraint
            sip-profile
            sip-isup-profile
            block-rtcp                      disabled
            hide-egress-media-update        disabled
            last-modified-by                admin@192.168.1.159
            last-modified-date              2010-06-17 10:03:28

      sip-interface
            state                           enabled
            realm-id                        access_internet
            description
            sip-port
                  address                           212.31.195.181
                  port                              5060
                  transport-protocol                UDP
                  tls-profile
                  allow-anonymous                   all
                  ims-aka-profile
            carriers
            trans-expire                    0
            invite-expire                   0
            max-redirect-contacts           0
            proxy-mode
            redirect-action
            contact-mode                    none
            nat-traversal                   always
            nat-interval                    30
            tcp-nat-interval                90
            registration-caching            enabled
            min-reg-expire                  300
            registration-interval           3600
            route-to-registrar              enabled
            secured-network                 disabled
            teluri-scheme                   disabled
            uri-fqdn-domain
            trust-mode                      all
            max-nat-interval                3600
            nat-int-increment               10
            nat-test-increment              30
            sip-dynamic-hnt                 disabled
            stop-recurse                    401,407
            port-map-start                  0
            port-map-end                    0
            in-manipulationid
            out-manipulationid
            manipulation-string
            manipulation-pattern
            sip-ims-feature                 disabled
            operator-identifier
            anonymous-priority              none
            max-incoming-conns              0
            per-src-ip-max-incoming-conns   0
            inactive-conn-timeout           0
            untrusted-conn-timeout          0
            network-id
```

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```
            ext-policy-server
            default-location-string
            charging-vector-mode            pass
            charging-function-address-mode pass
            ccf-address
            ecf-address
            term-tgrp-mode                  none
            implicit-service-route          disabled
            rfc2833-payload                 101
            rfc2833-mode                    transparent
            constraint-name
            response-map
            local-response-map
            ims-aka-feature                 disabled
            enforcement-profile
            route-unauthorized-calls
            tcp-keepalive                   none
            add-sdp-invite                  disabled
            add-sdp-profiles
            sip-profile
            sip-isup-profile
            last-modified-by                admin@172.16.1.240
            last-modified-date              2009-09-29 06:36:57
sip-interface
            state                           enabled
            realm-id                        sipserver_internet
            description
            sip-port
                    address                         212.31.195.181
                    port                            5061
                    transport-protocol              UDP
                    tls-profile
                    allow-anonymous                 all
                    ims-aka-profile
            carriers
            trans-expire                    0
            invite-expire                   0
            max-redirect-contacts           0
            proxy-mode
            redirect-action
            contact-mode                    none
            nat-traversal                   none
            nat-interval                    30
            tcp-nat-interval                90
            registration-caching            disabled
            min-reg-expire                  300
            registration-interval           3600
            route-to-registrar              disabled
            secured-network                 disabled
            teluri-scheme                   disabled
            uri-fqdn-domain
            trust-mode                      all
            max-nat-interval                3600
            nat-int-increment               10
            nat-test-increment              30
            sip-dynamic-hnt                 disabled
            stop-recurse                    401,407
```

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```
        port-map-start                  0
        port-map-end                    0
        in-manipulationid
        out-manipulationid
        manipulation-string
        manipulation-pattern
        sip-ims-feature                 disabled
        operator-identifier
        anonymous-priority              none
        max-incoming-conns              0
        per-src-ip-max-incoming-conns   0
        inactive-conn-timeout           0
        untrusted-conn-timeout          0
        network-id
        ext-policy-server
        default-location-string
        charging-vector-mode            pass
        charging-function-address-mode  pass
        ccf-address
        ecf-address
        term-tgrp-mode                  none
        implicit-service-route          disabled
        rfc2833-payload                 101
        rfc2833-mode                    transparent
        constraint-name
        response-map
        local-response-map
        ims-aka-feature                 disabled
        enforcement-profile
        route-unauthorized-calls
        tcp-keepalive                   none
        add-sdp-invite                  disabled
        add-sdp-profiles
        sip-profile
        sip-isup-profile
        last-modified-by                admin@192.168.1.159
        last-modified-date              2010-06-17 10:11:41

steering-pool
        ip-address                      212.31.195.181
        start-port                      10000
        end-port                        19999
        realm-id                        access_internet
        network-interface
        last-modified-by                admin@172.16.1.240
        last-modified-date              2009-09-29 06:35:44
steering-pool
        ip-address                      212.31.195.181
        start-port                      30000
        end-port                        49999
        realm-id                        sipserver_internet
        network-interface
        last-modified-by                admin@192.168.1.159
        last-modified-date              2010-06-17 10:20:37

local-policy
        from-address
```

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```
                                        *
        to-address
                                        *
        source-realm
                                        access_internet
        description
        activate-time                   N/A
        deactivate-time                 N/A
        state                           enabled
        policy-priority                 none
        last-modified-by                admin@192.168.1.159
        last-modified-date              2010-06-17 10:24:59
        policy-attribute
                next-hop                        85.17.186.7
                realm                           sipserver_internet
                action                          none
                terminate-recursion             disabled
                carrier
                start-time                      0000
                end-time                        2400
                days-of-week                    U-S
                cost                            0
                app-protocol
                state                           enabled
                methods
                media-profiles
                lookup                          single
                next-key
                eloc-str-lkup                   disabled
                eloc-str-match

sip-manipulation
        name                            msrp
        description
        split-headers
        join-headers
        header-rule
                name                            storePort
                header-name                     Content-Type
                action                          store
                comparison-type                 case-sensitive
                msg-type                        any
                methods                         INVITE
                match-value
                new-value
                element-rule
                        name                    storePort
                        parameter-name          pplication/sdp
                        type                    mime
                        action                  store
                        match-val-type          any
                        comparison-type         pattern-rule
                        match-value             (m=.* (\d{1,5})
TCP/MSRP)
                        new-value
        header-rule
                name                            changeALine
```

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```
                    header-name                     Content-Type
                    action                          manipulate
                    comparison-type                 pattern-rule
                    msg-type                        any
                    methods                         INVITE
                    match-value
                    new-value
                    element-rule
                            name                    changeIP
                            parameter-name          application/sdp
                            type                    mime
                            action                  find-replace-all
                            match-val-type          any
                            comparison-type         pattern-rule
                            match-value
a=path:msrp://(\d{1,3}\.\d{1,3}\.\d{1,3}\.\d{1,3}):\d{1,3}[[:1:]]
                            new-value               $LOCAL_IP
                    element-rule
                            name                    changePort
                            parameter-name          application/sdp
                            type                    mime
                            action                  find-replace-all
                            match-val-type          any
                            comparison-type         pattern-rule
                            match-value
a=path:msrp://\d{1,3}\.\d{1,3}\.\d{1,3}\.\d{1,3}:(\d{1,5})[[:1:]]
                            new-value
$storePort.$storePort.$2
            last-modified-by                admin@192.168.1.159
            last-modified-date              2010-06-18 09:57:18
```

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