

Multiservice Switching Forum Contribution

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Working Group: Media Control Working group

Title: **DRAFT Implementation Agreement for MEGACO/H.248 Profile for an IP Line Side Access Gateway.**

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Abstract:

This contribution identifies the requirements for a MSF Line Side Access gateway to support Voice over IP.

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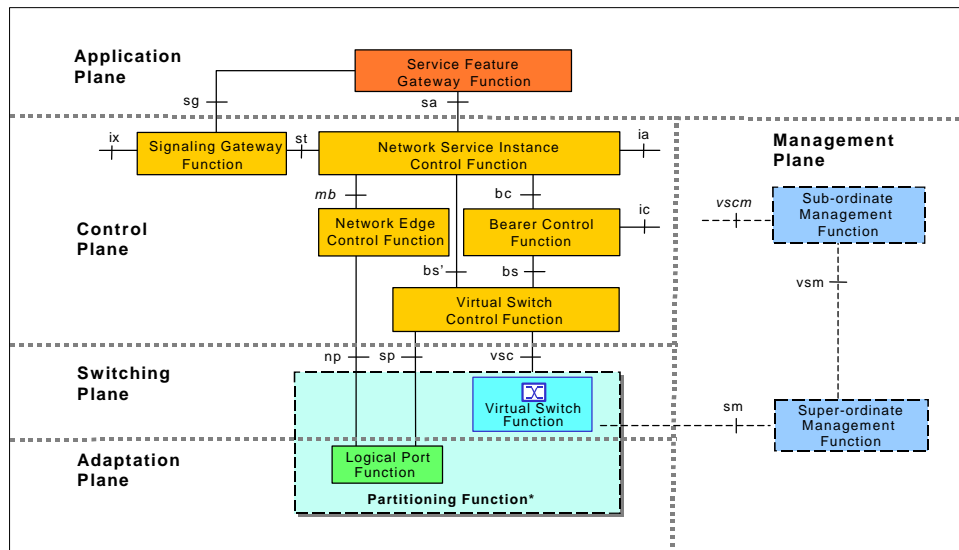
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1 Multiservice Switching Forum

The charter of the Multiservice Switching Forum is to develop and promote implementation agreements for protocols and interfaces that enable an open architecture for multiservice switching systems supporting ATM, Frame Relay, IP, Voice and Video services. A Multiservice Switching System is a distributed switching (frame, cell or packet based) system designed to support voice, video, private line, and data such as Asynchronous Transfer Mode (ATM), Frame Relay, and Internet Protocol (IP) services. Multiservice switching systems may use a broad range of access technologies, including traditional Time Division Multiplexing (TDM), Digital Subscriber Line (xDSL), wireless data, and cable modems. MSF Implementation Agreements define the requirements of the interfaces between components of a MSS.

The current MSF Reference Architecture, as defined in MSF2000.053.1, Multiservice Switching Forum System Architecture Implementation Agreement¹, provides a reference point, np, between the Network Edge Control Function and the Logical Port Function (see Figure 1). In one implementation scenario, the Logical Port Function is contained in a Media Gateway (MG) and the Network Edge Control Function is one of the functions within a Media Gateway Controller (MGC). Thus, the reference point 'np' can be defined as the interface for the MEGACO/H.248 protocol defined jointly by the IETF and ITU-T.



Notes:
 - Italicized reference points are not considered open reference points for release 1.
 - Bearer transport reference points are not shown.
 [] - Management functions overlaid on functional architecture
 * The Partitioning Function maintains partition integrity between partitions of a partitioned entity.

Figure 1 - Reference Architecture Corresponding to Functional Definitions

¹ Bjorkman, Nils, "Multiservice Switching Forum System Architecture Implementation Agreement", MSF99.245.0, November 26, 1999

2 Megaco/H.248

The Megaco/H.248 (H.248) protocol is the official standard for allowing a Media Gateway Controller (MGC) to control Media Gateways (MG). The ITU and IETF, as well as, forums such as the Multiservice Switching Forum (MSF) support this standard. H.248 will be the common protocol for the convergent networks and that will allow calls to physically separate call control from the media and bearer control. This decomposed gateway architecture is shown in Figure 2.

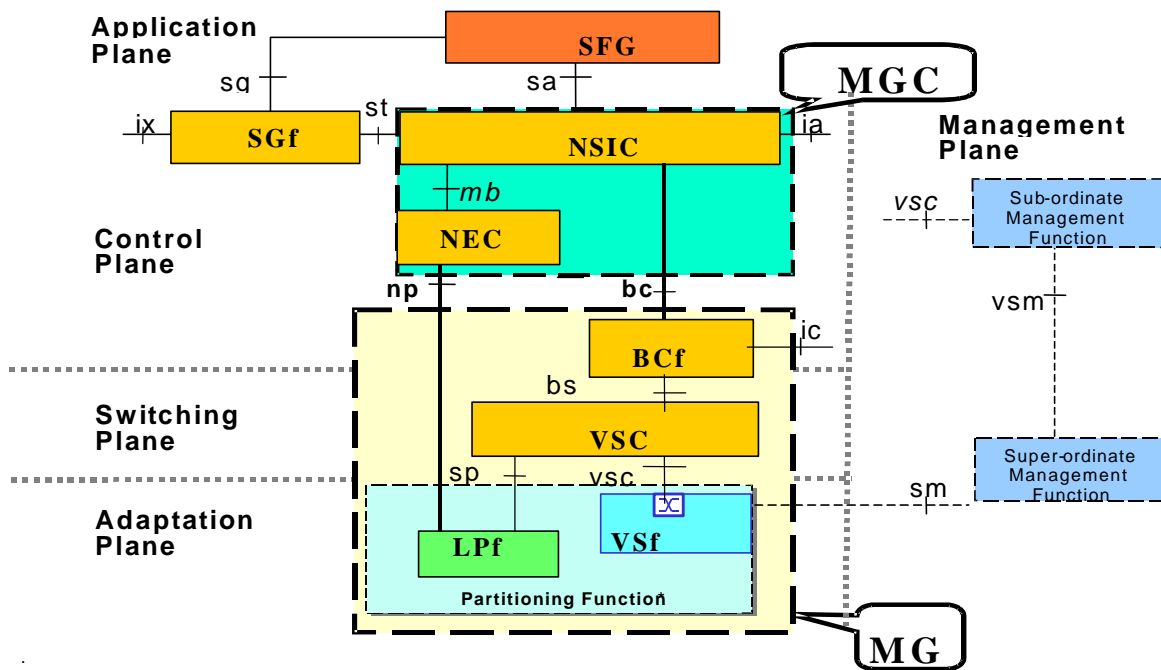


Figure 2 H248/Megaco protocol run on top of the np+bc reference point.

The decomposed gateway architecture distributes the call control functionality and the media processing functionality over different network elements. A MG may be located at any point in the call path and will be the junction that provides a path between switched and packet networks for both voice and data. The H.248 protocol is designed to handle different combinations of media in different topologies and different combinations of transport. The H.248 interface covered in this Profile is shown in the above picture.

2.1 MEGACO/H.248 Packages

As defined in Megaco/H.248, packages define properties, events, signals and statistics. These packages can be defined by the IETF (as separate RFCs) and by the ITU-T (as an annex to H.248). This implementation agreement defines the packages to be used.

2.2 MEGACO/H.248 Profiles

Profiles in Megaco/H.248 define option values, sets of packages, naming conventions and other details for an entire set of applications. Profiles may be defined by any organization. This implementation agreement defines one such profile.

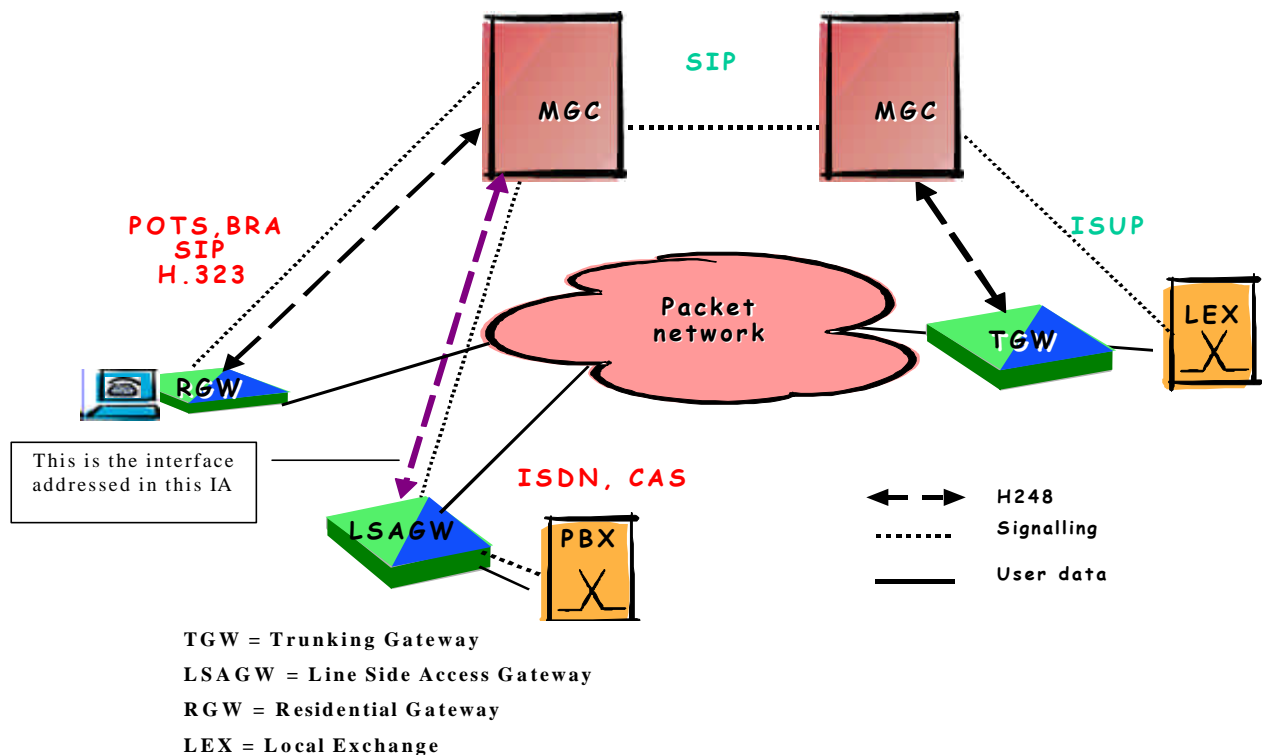
3 Assumptions

The MSF will issue several Implementation Agreements (IAs) that will be used in the MSF Interoperability testing and demonstrations. This agreement does not define the test suites or scenarios for the testing, but will provide the framework for those tests.

This H.248 Profile only specifies minimum functionality and requirements for interoperability purposes. Additional functionality, requirements, packages and properties may be added as necessary for different types of H.248 testing and implementation. It assumes the profile is for use with the H.248 master/slave approach by allowing line side access gateways functions to be distributed.

4 Line Side Access Gateway Definition

A Line Side Access Gateway, as used in this IA, converts media provided in one type of network to the format required in another type of network. The line side access gateway is a device that converts traditional subscriber circuit switched traffic to a packet-based network, and vice versa. An IP line side access gateway may support devices such as analog phones; PBX trunks, with mediation to a packet based network that is IP based.



The services provided to subscribers by the combination of the Line Side Access Gateway and the controller include:

- Analog line signaling using DTMF and MF for 10 digit North American Dialing
- Analog line signaling using DTMF and MF for 6-16 digit International Dialing
- Full and Fractional E1, T1, DS3 trunks
- DNIS and ANI Local Number Portability (LNP)
- Private Numbering Plan Support
- VPN support
- Emergency/911 priority call
- Caller ID
- On-net to Off-net calling
- Trunk group member selection
- G.711 u-law or a-law encoding ITU-T Recommendation G.711
- G.711 with and without silence suppression ITU-T Recommendation G.711
- G.729a is optional
- G.729 is optional
- G.723.1 is optional
- G.726 is optional
- G.165/168 – echo cancellation on a per call basis

5. MEGACO/H.248 Profile

5.1 Identification

This profile shall be entitled “MSF IP Line Side Access Gateway to Controller Profile.” The version number shall be 1.0. This name shall be returned from a conforming gateway when sending the Service Change message as part of initial registration of the MG in the Profile section of the Service Change Descriptor.

5.2 Packages Implemented

A conforming gateway shall implement at least the following packages.

Package Name	ID	Version	Defined In
Generic Package	g	1.0	ITU-T H.248/IETF RFC3015 Annex E
Root Package	root	1.0	ITU-T H.248/IETF RFC3015 Annex E
Analog Line Supervision Package	al	1.0	ITU-T H.248/IETF RFC3015 Annex E
Network Package	nt	1.0	ITU-T H.248/IETF RFC3015 Annex E
TDM Circuit Packages	tdmc	1.0	ITU-T H.248/IETF RFC3015 Annex E
Continuity	Ct	1.0	ITU-T H.248/IETF RFC3015 Annex E
Tone Generator Package	tonegen	1.0	ITU-T H.248/IETF RFC3015 Annex E
Tone Detection Package	tonedet	1.0	ITU-T H.248/IETF RFC3015 Annex E
DTMF Generator Package	dg	1.0	ITU-T H.248/IETF RFC3015 Annex E
DTMF Detection Package	dd	1.0	ITU-T H.248/IETF RFC3015 Annex E
Call Process Tones Generator Package	cg	1.0	ITU-T H.248/IETF RFC3015 Annex E
Call Process Tones Detection Package	cd	1.0	ITU-T H.248/IETF RFC3015 Annex E
RTP Package	rtp	1.0	ITU-T H.248/IETF RFC3015 Annex E

5.3 Optional Packages

A conforming gateway may implement the following packages.

Package Name	ID	Version	Defined In
Enhanced Alerting	Alert	1.0	IETF draft – draft-boyle-megaco-alerting-01.txt
Announcements	An	1.0	ITU-T H 248 Annex K
Modem	Mdm	1.0	Draft-ietf-megaco-otherpkgs-00.txt
Fax/Modem	Ftmd	1.0	ITU-T h.248 Annex F/draft-ietf-megaco-h248f-01.txt
Fax	Fax	1.0	ITU-T h.248 Annex F/draft-ietf-megaco-h248f-01.txt

5.4 CAS Support Packages

A conforming gateway shall implement the following packages if CAS signaling is required.

Basic CAS	bcas	2	IETF draft-manyfolks-megaco-caspackage-00.txt
Robbed Bit	Rbs	2	IETF draft-manyfolks-megaaco-caspackage-00.txt
MF Gen	Mfg	1	IETF draft-bothwell-megaco-mftonepkgs.00.txt
MF Detect	Mfd	1	IETF draft-bothwell-megaco-mftonepkgs-00.txt

5.5 Naming Conventions

5.5.1 Gateway Naming Conventions

The MG name, used in Registration and in the header of commands, shall be a fully qualified domain name, recognized by the DNS or IP address.

5.5.2 Termination Names

This profile uses hierarchical termination names in which the slash “/” serves as a separator.

5.5.3 Physical Terminations

Physical Terminations can be semi-permanent or provisioned in the MG such as a TDM circuit. Physical Terminations shall be hierarchical with the top levels a provisioned name and lower levels represented by numeric identifiers.

<provisioned name>/assigned channel

The provisioned name may be up to 22 characters in length and the assigned channel (time-slot) is within the range of 01-32.

It also could be possible to have a physical termination to three levels. For example, you had a DS3 trunk and the provisioned name could be DAL3 and its DS1s could start as DAL3/01 and then its DS0s could be name starting with DAL3/01/01.

Example:

DAL3/<slot_number>/<channel_number>

5.5.2.2 Ephemeral Terminations

Ephemeral Terminations are created by an ADD command and destroyed by a subtract command. They only exist for the duration of their use. In this profile an Ephemeral Termination will be an IP termination.

5.6 SDP

This profile shall use the SDP protocol for IP connections as described in RFC 2327 and draft-ietf-mmusic-sdp-atm-05.txt.

Mandatory SDP lines that must be supported:

v=protocol version
c=connection information
m=media information and transport address
a=media attributes

The rest of the lines such as “s=”, “t=”, and “o=” are considered as options. Gateways will accept all SDP parameters that are fully compliant with RFC2327; but are only required to support the mandatory SDP parameters.

5.7 Topology Descriptor

A gateway conforming to this profile is not required to implement Topology and MGCs expecting to control gateway meeting this specification shall not assume Topology is implemented.

5.8 Transport

Gateways shall implement UDP/ALF and may implement SCTP transport of H.248. MGCs shall implement UDP/ALF and SCTP transport of H.248. Gateways and MGCs conforming to this profile are expected to transport signaling over IP.

5.9 Digit Maps

Digit Maps are optional and may be included in the Line Side Access Gateways.

5.9.1 Storage

A gateway is not required to store Digit Maps.

5.9.2 Naming Conventions

Digit Maps shall be 1-32 alphanumeric.

5.10 Time Stamps

Timestamp shall be sent on every Notify command/message expressed in UTC, when UDP is utilized.

5.11 Service Change

This profile shall support the Service Change command as described in Section 7.2.8 of H.248 Protocol.

MG shall allow at least one primary and one secondary MGC to be provisioned for registration. The MG shall either be provisioned manually or via DHCP. If DHCP is used then the DHCP server shall provide the MGC addresses. The MG shall only respond to messages sent from the provisioned MGCs, all other messages shall be ignored.

This profile may support a single MG to be partitioned into multiple virtual MGs; each associated with a different controller. Support for Virtual MGs is considered as an option for this profile.

5.12 Error Codes

Conforming MG shall support the error handling and error codes listed in Section 7.3 of H.248 Protocol.

When a MG reports an error to a MGC, it shall do so in an Error Descriptor. Error Descriptor shall consist of an error code and accompanied by an error text.

5.13 DTMF

A conforming MG shall support DTMF in accordance with RFC 2833.

5.14 Encoding

Conforming MG SHALL support text encoding.