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Generalized MPLS Signaling - Implementation Survey

draft-ietf-ccamp-gmpls-signaling-survey-03.txt

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Abstract

This document provides a survey of GMPLS signaling implementations. The primary focus of this survey are the signaling protocol mechanisms specified in the Generalized MPLS signaling documents. Other specifications and documents are listed if included in the submitted form. The survey form and latest version of this document are available from http://www.labn.net/gmpls-survey.

Contents

1. Survey Summary

This document is a compilation of responses to the GMPLS Signaling implementation form found at http://www.labn.net/gmpls-survey/sig-survey.txt. After a brief summary, each response in it's entirety is listed. (**The editors, make no claim as to the accuracy of the information provided nor do they endorse the statements made within each response.**) Anonymous submissions were handled by Scott Bradner, sob@harvard.edu. All identifying information was removed prior to these submissions being forwarded to the editors. Generalized MPLS signaling is specified in the documents [GMPLS-SIG], [GMPLS-RSVP], [GMPLS-LDP] and [GMPLS-SONET].

Table 1 summarizes the results of the GMPLS signaling aspects of survey. Many included implementation details for other specifications or drafts. These details are included in the full response section, but not in the summary table. Table 2 provides total results by feature/question.

The categories covered in summary Table 1 are:

- Type
  Indicates type of implementation. Indicated types include: tester, (network) equipment, (portable or internal use) code. If the type was not evident, "unknown" is used.

- Drafts
  Indicates supported drafts. [GMPLS-SIG] is assumed. "R" is used to indicate [GMPLS-RSVP], "L" indicates [GMPLS-LDP] and "S" indicates [GMPLS-SONET].

- Software (S/w) Genealogy
  Indicates the source of the implementation. Two sub-categories are listed. The "external" category indicates the original source of the code, or "yes" if not indicated. The "internal" indicates the part of the code developed by the respondent.

- Switch Capabilities
  Indicates the type of switching supported. "P" indicates PSC, "T" indicates TDM, "L" indicates LSC and "F" indicates FSC.

- Label Types
  Indicates the supported label types. "M" indicates MPLS labels, "G" indicates the generalized label, "W" indicates waveband labels and "S" indicates SONET/SDH label.

- Feature Summary
  Summarizes supported features, by sub-category broken out in the survey form. Sub-categories are indicated in the table header. The "L" sub-category is used for form section 11, "Label Related". "B" is used for form section 13, "Bidirectional LSPs". "N" is used for form section 14, "Notification". "O" is used for form section 15, "Other features".

  In the table, an "F" indicates that all sub-category features list in the form are supported. A "P" indicates partial support, i.e., some boxes were not checked.

Ref. Section	Type	Draft	S/w Genealogy External:Internal	Switch Caps.	Label Types	Feature L:B:N:O
2.1	Equip.	R S	Yes :n/a	P T L	M G S	F:F:P:P
2.2	Tester	R S	:All	P T L F	M G W S	F:F:F:F
2.3	Equip.	R S	Yes :n/a	T L F	G W S	P:F:F:F
2.4	Equip.	R	Yes :TE	L F	G	P:F:P:P
2.5	Code	R S	Yes :n/a	T	S	:F: :
2.6	Code	R S	Yes :GMPLS	P T L F	M G W S	F:F:P:P
2.7	Equip.	R S	:All	P T	G S	:F:P:
2.8	Code	R L	:All	L F	G W	F:F:F:F
2.9	Code	R S	ISI :TE,GMPLS	T	G S	P:F:P:P
2.10	Equip.	R S	:All	P T	M G S	P:F:F:P
2.11	Code	R S	:All	n/a	G	P:F: :P
2.12	Equip.	R S	:All	P	M G S	P:F: :P
2.13	Equip.	R	Yes :GMPLS	L	G	:F: :
2.14	Equip.	R S	:All	T L F	G W S	P:F:F:F
2.15	Equip.	R S	LabN :GMPLS	T L F	G S	F:F:F:F
2.16	Equip.	R S	Yes :n/a	T	S	F:F:P:F
2.17	Code	R S	:All	P T L F	M G W S	F:F:F:P
2.18	Equip.	R S	Yes :n/a	P L	M G W	F:F:P:P
2.19	Code	L	n/a	n/a	M G W S	F:F:F:
2.20	Equip.	R S	Yes :n/a	T	S	P:F:P:F
2.21	Equip.	R S	Yes :n/a	T L F	G S	F:F:P:P
2.22	Equip.	R S	Yes :n/a	T L F	G S	F:F:P:P

2.23	Equip.	R	Yes	:n/a	P	L	F	M	G	W	P:F:P:P
2.24	Code	R	L		:All	P	T	M	G		S	F:F:F:P
2.25	Unknown	R	Yes	:n/a		L		G			P:F:P:P

"n/a" indicates that no answer was provided.

Table 1: Survey Results Summary

Total GMPLS-RSVP	Total GMPLS-LDP	Section, Description
25		Total participants
24	-	6. Reference Draft - [GMPLS-RSVP]
-	3	6. Reference Draft - [GMPLS-LDP]
20		6. Reference Draft - [GMPLS-SONET]
10	2	5.1 Switching capabilities - PSC
15	1	5.2 Switching capabilities - TDM
15	2	5.3 Switching capabilities - LSC
10	1	5.4 Switching capabilities - FSC
1		9.1 Implementation based on - Purchased code
1		9.2 Implementation based on - Free code
12	2	9.3 Implementation based on - Internal
15	1	9.4 Implementation based on - Combination
10	3	10.1 MPLS Label
22	3	10.2 Generalized Label
9	3	10.3 Waveband Label
18	2	10.4 SONET/SDH Label
19	3	11.1 Suggested Label
15	3	11.2 Label Set
10	-	12.1 Traffic Parameters - Intserv
-	6	12.2 Traffic Parameters - CR-LDP
21	3	12.3 GMPLS Bandwidth Encoding
18	2	12.4 Traffic Parameters - SONET/SDH
24	4	13. Bidirectional LSPs
10	3	14.1 Acceptable Label Set
15	-	14.2 Notify Request Objects
18	-	14.3 Notify Message
19	-	14.4 Removing State with a PathErr message
17	2	15.1 Explicit Label Control
17	2	15.2 Protection Information
17	2	15.3 Administrative Status Information
18	2	15.4 Interface Identification
16	2	15.5 Errored Interface Identification
16	1	15.6 Link Fault Handling
13	1	15.7 Nodal Fault Handling

"-" indicates that items is not relevant to protocol.

Table 2: Survey Totals

2. Survey Forms

2.1. AcceLight Networks

GMPLS Signaling Implementation Survey Form [V 1.1]

1. Organization:
AcceLight Networks

1.1 Organization url(s):

www.accelight.com

2. Product title(s):

PXS 540

2.1 Brief description(s):

The PXS 540 is a new class of network element. The 'Photonic Service Switch' intgerates data plane switching across a fast switching photonic fabric (POS, GE, SONET/SDH), and the control plane with GMPLS extensions.

The PXS 540 can be deployed as a classical MPLS LSR, Broadband TDM crossconect (BXC), and/or an opaque Optical crossconnect (OXC). With service integration or any combination of functions can also be configured such as BXC+OXC, MPLS LSR+OXC, MPLS+BXC or MPLS LSR+BXC+OXC.

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3. Contact for GMPLS information

3.1 Name: Debashis Basak

3.2 Title: Lead Engineer

3.3 E-mail: dbasak@accelight.com

3.4 Organization/department: Software - Routing & Signaling

3.5 Postal address: 70 Abele Rd, Suite 1200, Bridgeville, PA 15017

3.6 Phone: 412-220-2102 x 115

3.7 Fax: 412-220-2450

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4. Status:
4.1 [ ] Development
4.2 [ ] Alpha
4.3 [X] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities

	[GMPLS-RSVP]	[GMPLS-LDP]	
5.1	[X]	[ ]	PSC
5.2	[X]	[ ]	TDM
5.3	[X]	[ ]	LSC
5.4	[ ]	[ ]	FSC

6. Reference Drafts (please list, include version numbers)

6.1 [X] draft-ietf-ccamp-gmpls-architecture-02.txt
6.2 [X] draft-many-ccamp-gmpls-framework-00.txt

6.3 [X] draft-ietf-ccamp-gmpls-routing-03.txt
6.4 [X] draft-ietf-ccamp-ospf-gmpls-extensions-05.txt
6.5 [X] draft-ietf-isis-gmpls-extensions-09.txt

6.6 [X] draft-ietf-mpls-generalized-signaling-07.txt
6.7 [X] draft-ietf-mpls-generalized-rsvp-te-06.txt
6.8 [X] draft-ietf-mpls-lsp-hierarchy-04.txt
6.9 [X] draft-ietf-mpls-rsvp-unnum-04.txt
6.10 [X] draft-ietf-ccamp-lmp-02.txt

6.11 [X] draft-ietf-ccamp-gmpls-sonet-sdh-03.txt

6.12 [X] draft-mannie-gmpls-recovery-terminology-00.txt
6.13 [X] draft-design-team-gmpls-recovery-analysis-00.txt
6.14 [X] RFC2961 Refresh Reduction
6.15 [X] draft-ietf-mpls-bundle-01.txt

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [X] Ethernet V2/DIX
7.4 [X] Ethernet 802.3
7.5 [X] SDH

7.6 [X] SONET
7.7 [X] Lambda
7.8 [ ] Fiber
7.9 [ ] FiberChannel
7.10 [X] Other (describe): Gigabit Ethernet (GE)
7.11 [X] Other (describe): POS (Packet over SONET)

8. Availability

	[GMPLS-RSVP]	[GMPLS-LDP]	
8.1	[ ]	[ ]	Public and free
8.2	[ ]	[ ]	Only to selected organizations/companies but free
8.3	[ ]	[ ]	On sale.
8.4	[ ]	[ ]	For internal company use only
8.5	[x]	[ ]	Other: As part of the Photonic Service Switch Platform

9. Implementation based on: (check all that apply)

	[GMPLS-RSVP]	[GMPLS-LDP]	
9.1	[ ]	[ ]	Purchased code (please list source if possible)
9.2	[ ]	[ ]	Free code (please list source if possible)
9.3	[ ]	[ ]	Internal implementation (no outside code, just from specs)
9.4	[X]	[ ]	Internal implementation on top of purchased or free code
9.4.1			List portions from external source: (Identify protocol if appropriate)
9.4.2			List portions developed internally: (Identify protocol if appropriate)

10. Supported Label Types

	[GMPLS-RSVP]	[GMPLS-LDP]	
10.1	[X]	[ ]	MPLS Label
10.2	[X]	[ ]	Generalized Label
10.3	[ ]	[ ]	Waveband Label
10.4	[X]	[ ]	SONET/SDH Label

11. Label Related

	[GMPLS-RSVP]	[GMPLS-LDP]	
11.1	[X]	[ ]	Suggested Label
11.2	[X]	[ ]	Label Set

12. Traffic Parameters

	[GMPLS-	[GMPLS-

	[GMPLS-RSVP]	[GMPLS-LDP]	
12.1	[X]	[ ]	Intserv (Please list which)
12.2	[ ]	[ ]	CR-LDP
12.3	[X]	[ ]	GMPLS Bandwidth Encoding
12.4	[X]	[ ]	SONET/SDH

13. Bidirectional LSPs

[GMPLS-RSVP]	[GMPLS-LDP]	
[X]	[ ]	Bidirectional LSPs

14. Notification

	[GMPLS-RSVP]	[GMPLS-LDP]	
14.1	[ ]	[ ]	Acceptable Label Set
14.2	[X]		Notify Request Objects (GMPLS-RSVP)
14.3	[X]		Notify Message (GMPLS-RSVP)
14.4	[X]		Removing State with a PathErr message (GMPLS-RSVP)

15 Other features

	[GMPLS-RSVP]	[GMPLS-LDP]	
15.1	[X]	[ ]	Explicit Label Control
15.2	[X]	[ ]	Protection Information
15.3	[X]	[ ]	Administrative Status Information
15.4	[X]	[ ]	Interface Identification
15.5	[ ]	[ ]	Errored Interface Identification
15.6	[X]	[ ]	Link Fault Handling
15.7	[ ]	[ ]	Nodal Fault Handling

16. Other specification(s) which apply:

16.1 [X] draft-ietf-mpls-diff-ext-09.txt
16.2 [X] RFC 2597 Assured Forwarding PHB group
16.3 [X] RFC 3246 An Expedited Forwarding PHB
16.4 [X] RFC 3036 LDP Specification
16.5 [X] RFC 3037 LDP Applicability
16.6 [X] RFC 2205 RSVP Protocol Specification
16.7 [X] RFC 3032 MPLS Label Stack encoding
16.8 [X] RFC 3031 Multiprotocol Label Switching Architecture

17. Other features supported:
17.1 related to [GMPLS-RSVP]
17.2 related to [GMPLS-LDP]
17.3 Other: see section 15, 16 and 20.

18. Currently-defined GMPLS signaling features not supported:

18.1 related to [GMPLS-RSVP]: none
18.2 related to [GMPLS-LDP]: none
18.3 related to [GMPLS-SONET]: none
18.4 Other: FSC interfaces

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

The PXS 540 delivers flexible intra AS switched services. The PXS 540 services large aggregation and/or metro core/regional applications such as STS-1 grooming, switched SONET/SDH, OCn optical services, Ethernet virtual leased lines, MPLS label switching, cable and/or DSL trunking.

The PXS 540 delivers an integrated overlay (hybrid) or peer networking architecture for switched services for the wavelength core.Topology discovery, and layer 3 route interworking are provided with IGPs such as IS-IS and OSPF. Traffic Engineering is intgerated through RSVP-TE with optical extensions. The resulting Photonic Service Switching (PSS) layer aggregates the edge services from elements such as routers, DSLAM, Dial, B-DACS, UPSR SONET ADM, and MPLS LERs to the existing WDM tansmission infrastrucuture.

20. If you feel the above categories are not complete, add others which will better describe your project:
20.1 [X] OIF Optical UNI
20.2 [X] OIF-UNI - GMPLS Interworking
20.3 [X] Out of Band Signaling

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Person filling out this form:

Same as contact person

Name: Johnson Kuruvila
E-mail: johnson@accelight.com
Tel.: 613-596-480
Title: Lead Engineer
Company: AcceLight Networks
Date prepared: April 4, 2002

2.2. Agilent Technologies

GMPLS Signaling Implementation Survey Form [V 1.0]

1. Organization: Agilent Technologies

1.1 Organization url(s): www.agilent.com/comms/RouterTester

2. Product title(s):
Agilent RouterTester System.
GMPLS RSVP Conformance Test Suite - E5172A
GMPLS, MPLS & OIF UNI RSVP Protocol Software - E5173A

2.1 Brief description(s):

The Agilent RouterTester platform has 2 software modules for testing GMPLS:

E5172A- Automated protocol conformance test suite that tests GMPLS extensions to RSVP and LMP. Operates over in-band or out of band signaling interfaces.
http://advanced.comms.agilent.com/RouterTester/datasheets/e5172a.htm

E5173A - Provides realistic Internet-scale GMPLS, MPLS, OIF UNI and LMP protocol emulation. This software operates with routing protocol software and traffic generation tools to provide comprehensive multiprotocol verification and stressing of GMPLS-capable devices and networks. Operates over in-band or out of band signaling interfaces.
http://advanced.comms.agilent.com/RouterTester/datasheets/e5173a.htm

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3. Contact for GMPLS information
3.1 Name: Sashi Vyravipillai

3.2 Title: Product Marketing Engineer

3.3 E-mail: sashi_vyravipillai@agilent.com

3.4 Organization/department:
Agilent Technologies,
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Blackburn Vic. 3130

Australia

3.6 Phone: +61-3-9210-5646

3.7 Fax: +61-3-9210-5550

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4. Status:
4.1 [ ] Development
4.2 [ ] Alpha
4.3 [ ] Beta
4.4 [X] Product
4.5 [ ] Other (describe):

5. Switching capabilities
5.1 [X] PSC
5.2 [X] TDM
5.3 [X] LSC
5.4 [X] FSC

6. Reference Drafts (please list, include version numbers)
6.1 [X] draft-ietf-mpls-generalized-signaling-07
6.2 [X] draft-ietf-mpls-generalized-rsvp-te-06
6.3 [X] draft-ietf-ccamp-gmpls-sonet-sdh-03
6.4 [X] draft-ietf-mpls-rsvp-unnum-04
6.5 [X] draft-ietf-mpls-bundle-01
6.6 [X] draft-ietf-ccamp-lmp-03
6.7 [X] RFC2961 Refresh Reduction
6.8 [X] draft-ietf-ccamp-ospf-gmpls-extensions-04

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [X] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [X] Ethernet 802.3
7.5 [X] SDH
7.6 [X] SONET
7.7 [X] Lambda (photonic)
7.8 [X] Fiber
7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability
8.1 [ ] Public and free
8.2 [ ] Only to selected organizations/companies but free
8.3 [X] On sale.
8.4 [ ] For internal company use only

8.5 [ ] Other:

9. Implementation based on: (check all that apply)
9.1 [ ] Purchased code (please list source if possible)
9.2 [ ] Free code (please list source if possible)
9.3 [X] Internal implementation (no outside code, just from specs)
9.4 [ ] Internal implementation on top of purchased or free code
9.4.1 [ ] List portions from external source
9.4.2 [ ] List portions developed internally

10. Supported Label Types
10.1 [X] MPLS Label (when using MPLS software)
10.2 [X] Generalized Label
10.3 [X] Waveband Label
10.4 [X] SONET/SDH Label

11. Label Related
11.1 [X] Suggested Label
11.2 [X] Label Set

12. Traffic Parameters
12.1 [X] Intserv (Please list which)
12.2 [ ] CR-LDP
12.3 [X] GMPLS Bandwidth Encoding
12.4 [X] SONET/SDH

13. [X] Bidirectional LSPs

14. Notification
14.1 [X] Acceptable Label Set
14.2 [X] Notify Request Objects (GMPLS-RSVP)
14.3 [X] Notify Message (GMPLS-RSVP)
14.4 [X] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features
15.1 [X] Explicit Label Control
15.2 [X] Protection Information
15.3 [X] Administrative Status Information
15.4 [X] Interface Identification
15.5 [X] Errored Interface Identification
15.6 [X] Link Fault Handling
15.7 [X] Nodal Fault Handling

16. Other specification(s) which apply:
[X] Link Management Protocol

17. Other features supported:
[X] In band control channel on OC48 and OC192 DCC interfaces

[X] Out of band control channel on Ethernet/GigE

18. Currently-defined GMPLS signaling features not supported:

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which will better describe your project:

[X] GRE Tunneling Support for control plane transport
[X] Unnumbered interface support
[X] Bundled interface support

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Person filling out this form:

Name: Cary Wright
E-mail: cary_wright@agilent.com
Tel.: +61-3-9210-5843
Title: R&D Project Manager
Company: Agilent Technologies
Date prepared: 8 March 2002

2.3. Alcatel

GMPLS Signaling Implementation Survey Form

1. Organization: Alcatel

1.1 Organization url(s): www.alcatel.com

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2. Product title(s): Alcatel Lambda Gate with Generalized Multiprotocol Routing Engine (GMRE)

2.1 Brief description(s): The Lambda Gate family, which supports crossconnects on SDH/SONET and OTH, provides with the GMRE the GMPLS functionality in networks.

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3. Contact for GMPLS information

3.1 Name: Gert Grammel

Stefan Ansorge
Papadimitriou Dimitri

3.2 Title:

3.3 E-mail: gert.grammel@netit.alcatel.it
stefan.ansorge@alcatel.de
dimitri.papadimitriou@alcatel.be

3.4 Organization/department: Alcatel TND
Alcatel Optical NA

3.5 Postal address: Via Trento 30,
I-20059 Vimercate, Italy

Lorenzstrasse, 10
70435 Stuttgart, Germany

Francis Wellesplein, 1
B-2018 Antwerpen, Belgium

3.6 Phone: +39 039 686 7060
+49 7 11 821 33744
+32 3 240 8491

3.7 Fax:

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4. Status:

4.1 [ ] Development
4.2 [x] Alpha (Supercom 2002 Demo)
4.3 [x] Beta (End 2002)
4.4 [ ] Product
4.5 [ ] Other (describe):

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5. Switching capabilities

5.1 [ ] PSC
5.2 [x] TDM
5.3 [x] LSC
5.4 [x] FSC

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6. Reference Drafts (please list, include version numbers)

6.1 RFC2205 - Resource Reservation Protocol, September 1997
6.2 RFC2208 - Resource Reservation Protocol Applicability Statement
6.3 RFC2961 - RSVP Summary Refresh and bundling, April 2001
6.4 RFC3209 - RSVP extensions for Tunnel Setup, December 2001
6.5 RFC3210 - Applicability statement for the extensions to RSVP for LSP Tunnels
6.6 Draft-ietf-ccamp-gmpls-architecture-02.txt
- Generalized Multi-Protocol Label Switching (GMPLS) Architecture
6.7 Draft-ietf-mpls-generalized-signaling-07.txt
- Generalized MPLS - Signaling Functional Description
6.8 Draft-ietf-mpls-generalized-rsvp-te-06.txt
- Generalized MPLS Signaling - RSVP-TE Extensions
6.9 Draft-ietf-mpls-rsvp-unnum-04.txt
- Signalling Unnumbered Links in RSVP-TE
6.10 Draft-ietf-ccamp-gmpls_sonet-sdh-03.txt
- Generalized MPLS extensions for SDH/SONET Network Control
6.11 Draft-ietf-mpls-bundle-01.txt
- Link Bundling in MPLS Traffic Engineering

6.12 RFC2328 - OSPF Version 2, April 1998
6.13 RFC2370 - Opaque LSA Types, July 1998
6.14 Draft-katz-yeung-ospf-traffic-06.txt
- Traffic Engineering Extensions to OSPF
6.15 Drat-ccamp-opsf-gmpls-extensions-04.txt
- OSPF Extensions in Support of Generalized MPLS
6.16 Draft-mannie-ccamp-gmpls-sonet-sdh-ospf-isis-00.txt
- Extensions to OSPF and IS-IS for GMPLS for SDH/SONET Control

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7. Interface technologies

7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [ ] Ethernet 802.3
7.5 [x] SDH
7.6 [x] SONET
7.7 [x] Lambda
7.8 [x] Fiber (future)
7.9 [x] FiberChannel (future)
7.10 [ ] Other (describe):

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8. Availability

8.1 [ ] Public and free
8.2 [ ] Only to selected organizations/companies but free
8.3 [x] On sale.
8.4 [x] For internal company use only
8.5 [ ] Other:

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9. Implementation based on: (check all that apply)

9.1 [x] Purchased code (please list source if possible)
9.2 [x] Free code (please list source if possible)
9.3 [x] Internal implementation (no outside code, just from specs)
9.4 [x] Internal implementation on top of purchased or free code
9.4.1 [ ] List portions from external source
9.4.2 [ ] List portions developed internally

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10. Supported Label Types

10.1 [ ] MPLS Label
10.2 [x] Generalized Label
10.3 [x] Waveband Label (future)
10.4 [x] SONET/SDH Label

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11. Label Related

11.1 [x] Suggested Label
11.2 [ ] Label Set

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12. Traffic Parameters

12.1 [ ] Intserv (Please list which)
12.2 [ ] CR-LDP
12.3 [x] GMPLS Bandwidth Encoding
12.4 [x] SONET/SDH

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13. [x] Bidirectional LSPs

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14. Notification

14.1 [x] Acceptable Label Set
14.2 [x] Notify Request Objects (GMPLS-RSVP)
14.3 [x] Notify Message (GMPLS-RSVP)
14.4 [x] Removing State with a PathErr message (GMPLS-RSVP)

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15. Other features

15.1 [x] Explicit Label Control
15.2 [x] Protection Information
15.3 [x] Administrative Status Information
15.4 [x] Interface Identification
15.5 [x] Errored Interface Identification
15.6 [x] Link Fault Handling
15.7 [x] Nodal Fault Handling

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16. Other specification(s) which apply:

- RSVP COPS -

16.1 RFC 2748 - The COPS (Common Open Policy Service) Protocol
16.2 RFC 2749 - COPS usage for RSVP
16.3 RFC 2753 - A Framework for Policy-based Admission Control
16.4 draft-ietf-rap-new-rsvpext-00.txt - RSVP Extension for Policy Control

- SNMP -

16.5 RFC 2571 - An architecture for Describing SNMP Management Frameworks
16.6 RFC 2574 - User-based Security Model (USM) for version 3 of the Simple
Network Management Protocol (SNMPv3)
16.7 RFC 2575 - Viewer-based Access Control Model (VACM) for the Simple
Network Management Protocol (SNMP)
16.8 RFC2863 - The Interfaces Group MIB

16.9 draft-nadeau-ccamp-gmpls-label-mib-01.txt
- Generalized Multiprotocol Label Switching (GMPLS) Label Management

Information Base
16.10 draft-nadeau-ccamp-gmpls-lsr-mib-01.txt
- Generalized Multiprotocol Label Switching (GMPLS) Label Switching
Router Management Information Base
16.11 draft-nadeau-ccamp-gmpls-tc-mib-01.txt
- Definition of Textual Conventions and OBJECT-IDENTITIES for
Generalized Multiprotocol Label Switching (GMPLS) Management
16.12 draft-nadeau-ccamp-gmpls-te-mib-01.txt
- Generalized Multiprotocol Label Switching (GMPLS) Traffic
Engineering Management Information Base
16.13 draft-ietf-ospf-mib-update-05.txt, November 2000
- OSPFv2 Management Information Base
16.14 RFC2206, September 1997
- RSVP Management Information Base using SMIv2
16.15 draft-ietf-mpls-tc-mib-03.txt, December 2001
- Definition of Textual Conventions and OBJECT-IDENTITIES
for Multi-Protocol Label Switching (MPLS) Management
16.16 draft-ietf-mpls-te-mib-08.txt, December 2001
- MPLS Traffic Engineering Management Information Base Using
SMIv2
16.17 draft-ietf-mpls-bundle-mib-00.txt, September 2001.
- Link Bundling Management Information Base Using SMIv2
16.18 draft-ietf-tewg-mib-01.txt, October 2001
- Traffic Engineering MIB

- LMP -

16.19 draft-ietf-ccamp-lmp-03.txt
- Link Management Protocol (v1)
16.20 draft-ietf-ccamp-lmp-mib-01.txt
- Link Management Protocol Management Information Base Using
SMIv2

- OIF -

16.21 User Network Interface (UNI) 1.0 Signaling Specification - OIF October'01

---

17. Other features supported:

17.1 OIF-UNI - GMPLS Interworking
17.2 Out of Band Signaling

17.3 Graceful Deletion

---

18. Currently-defined GMPLS signaling features not supported:

---

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

---

20. If you feel the above categories are not complete, add others which will better describe your project:

2.4. Calient Networks

GMPLS Signaling Implementation Survey Form [V 1.0]

1. Organization: Calient Networks

1.1 Organization url(s): http://www.calient.net

2. Product title(s): DiamondWave Photonic Switch

2.1 Brief description(s): MEMS-based photonic switch, leveraging GMPLS to provide dynamic provisioning and mesh-based protection/restoration.

---

3. Contact for GMPLS information

3.1 Name: james scott

3.2 Title: s/w arch

3.3 E-mail: jscott@calient.net

3.4 Organization/department: san jose/engineering

3.5 Postal address: 5853 rue ferrari
san jose, CA 95138

3.6 Phone: 408.972.3709

3.7 Fax: 408.972.3800

---

4. Status:
4.1 [ ] Development
4.2 [ ] Alpha
4.3 [X] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities
5.1 [ ] PSC
5.2 [ ] TDM
5.3 [X] LSC
5.4 [X] FSC

6. Reference Drafts (please list, include version numbers)
6.1 [X] draft-ietf-ccamp-lmp-03.txt
6.2 [X] RFC 2784 : GRE Tunneling
6.3 [X] RFC 2205 : RSVP
6.4 [X] RFC 3209 : RSVP-TE
6.5 [X] draft-ietf-mpls-generalized-rsvp-te-05.txt
6.6 [X] RFC 2961 : RSVP Refresh Reduction
6.7 [X] draft-ietf-mpls-rsvp-unnum-03.txt
6.8 [X] RFC 2328 : OSPFv2
6.9 [X] RFC 2370 : OSPF Opaque LSA
6.10 [X] draft-katz-yeung-ospf-traffic-06.txt
6.11 [X] draft-ietf-ccamp-ospf-gmpls-extensions-00.txt

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [X] Ethernet V2/DIX
7.4 [X] Ethernet 802.3
7.5 [X] SDH
7.6 [X] SONET
7.7 [X] Lambda (photonic)
7.8 [X] Fiber
7.9 [ ] FiberChannel
7.10 [X] Other (describe): device is transparent. all defined
LSP encoding types are supported.

8. Availability
8.1 [ ] Public and free
8.2 [ ] Only to selected organizations/companies but free
8.3 [X] On sale.

8.4 [ ] For internal company use only
8.5 [ ] Other:

9. Implementation based on: (check all that apply)
9.1 [ ] Purchased code (please list source if possible)
9.2 [ ] Free code (please list source if possible)
9.3 [ ] Internal implementation (no outside code, just from specs)
9.4 [X] Internal implementation on top of purchased or free code
9.4.1 [X] List portions from external source
OSPFv2
RSVP
9.4.2 [X] List portions developed internally
OSPF-TE
distributed RSVP-TE
LMP

10. Supported Label Types
10.1 [ ] MPLS Label
10.2 [X] Generalized Label
10.3 [ ] Waveband Label
10.4 [ ] SONET/SDH Label

11. Label Related
11.1 [X] Suggested Label
11.2 [ ] Label Set

12. Traffic Parameters
12.1 [X] Intserv (Please list which)
PATH
Session
IF_ID RSVP Hop
Time Values
Sender Template
Sender Tspec
Message_ID/Message_ID_ACK/Message_ID_NACK
ERO
RRO
Generalized Label Request (LSC/FSC only)
Suggested Label
Upstream Label
Recovery Label
Protection
Notify Req
AdminStatus

PATHErr
Session
Sender Template

```
                Sender Tspec
                Message_ID/Message_ID_ACK/Message_ID_NACK
                ErrorSpec
                RRO

              RESV
                Session
                Time Values
                Message_ID/Message_ID_ACK/Message_ID_NACK
                IF_ID RSVP Hop
                Resv Confirm
                Notify Request
                AdminStatus
                Style (FF or SE)
                Flowspec
                Filterspec
                RSVP Label
                RRO
                Generalized Label

              RESVErr
                Session
                IF_ID RSVP Hop
                Message_ID/Message_ID_ACK/Message_ID_NACK
                ErrorSpec
                Style (FF and SE)

              NOTIFY
                Session
                Sender Template
                Message_ID/Message_ID_ACK/Message_ID_NACK
                AdminStatus
                ErrorSpec

              HELLO
                Hello
                Restart Capabilities

              Summary Refresh
                Session
                Message_ID/Message_ID_ACK/Message_ID_NACK
                Message ID List
```

12.2 [ ] CR-LDP
12.3 [X] GMPLS Bandwidth Encoding
12.4 [ ] SONET/SDH

13. [X] Bidirectional LSPs

14. Notification
14.1 [ ] Acceptable Label Set
14.2 [X] Notify Request Objects (GMPLS-RSVP)
14.3 [X] Notify Message (GMPLS-RSVP)
14.4 [ ] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features
15.1 [ ] Explicit Label Control
15.2 [X] Protection Information
15.3 [X] Administrative Status Information
15.4 [X] Interface Identification
15.5 [X] Errored Interface Identification
15.6 [X] Link Fault Handling
15.7 [X] Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:

Resilient GMPLS control channels
LSP hierarchy (static)

18. Currently-defined GMPLS signaling features not supported:

Label Set
Waveband Switching
SONET/SDH extensions

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which will better describe your project:

==========

Person filling out this form:

Name: james scott
E-mail: jscott@calient.net
Tel.: 408.972.3709
Title: s/w arch
Company: calient
Date prepared: 02.03.11

2.5. Ciena Corporation

GMPLS Signaling Implementation Survey Form [V 1.1]

1. Organization: Ciena Corporation

1.1 Organization url(s): www.ciena.com

2. Product title(s): MetroDirector, CoreDirector

2.1 Brief description(s): Metro and core optical switches with STS-1 granularity. GMPLS is implemented using the OIF UNI 1.0 Implementation agreement in order to support interoperability.

---

3. Contact for GMPLS information
3.1 Name: Lyndon Ong

3.2 Title: Dir., Net. Control and Management

3.3 E-mail: lyong@ciena.com

3.4 Organization/department: CTO

3.5 Postal address: 10480 Ridgeview Court, Cupertino, CA 95014

3.6 Phone: 408-366-3358

3.7 Fax:
---

4. Status:
4.1 [ ] Development
4.2 [X] Alpha
4.3 [ ] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities

	[GMPLS-RSVP]	[GMPLS-LDP]	
5.1	[ ]	[ ]	PSC
5.2	[X]	[ ]	TDM
5.3	[ ]	[ ]	LSC
5.4	[ ]	[ ]	FSC

6. Reference Drafts (please list, include version numbers)
6.1 [X] draft-ietf-mpls-generalized-signaling-06.txt
6.2 [X] draft-ietf-mpls-generalized-rsvp-te-05.txt
6.3 [X] draft-ietf-ccamp-gmpls-sonet-sdh-02.txt
6.4 [ ]

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [ ] Ethernet 802.3
7.5 [X] SDH
7.6 [X] SONET
7.7 [ ] Lambda (photonic)
7.8 [ ] Fiber
7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability

	[GMPLS-RSVP]	[GMPLS-LDP]	
8.1	[ ]	[ ]	Public and free
8.2	[ ]	[ ]	Only to selected organizations/companies but free
8.3	[ ]	[ ]	On sale.
8.4	[X]	[ ]	For internal company use only
8.5	[ ]	[ ]	Other:

9. Implementation based on: (check all that apply)

	[GMPLS-RSVP]	[GMPLS-LDP]	
9.1	[ ]	[ ]	Purchased code (please list source if possible)
9.2	[ ]	[ ]	Free code (please list source if possible)
9.3	[ ]	[ ]	Internal implementation (no outside code, just from specs)
9.4	[X]	[ ]	Internal implementation on top of purchased or free code
9.4.1			List portions from external source: (Identify protocol if appropriate)
9.4.2			List portions developed internally: (Identify protocol if appropriate)

10. Supported Label Types

	[GMPLS-RSVP]	[GMPLS-LDP]	
10.1	[ ]	[ ]	MPLS Label
10.2	[ ]	[ ]	Generalized Label

```
10.3    [ ]      [ ] Waveband Label
10.4    [X]      [ ] SONET/SDH Label

11.  Label Related
      [GMPLS-   [GMPLS-
       RSVP]     LDP]
11.1    [ ]      [ ] Suggested Label
11.2    [ ]      [ ] Label Set

12.  Traffic Parameters
      [GMPLS-   [GMPLS-
       RSVP]     LDP]
12.1    [ ]          Intserv (Please list which)
12.2               [ ] CR-LDP
12.3    [ ]      [ ] GMPLS Bandwidth Encoding
12.4    [X]      [ ] SONET/SDH

13.   Bidirectional LSPs
      [GMPLS-   [GMPLS-
       RSVP]     LDP]
        [X]      [ ] Bidirectional LSPs

14.  Notification
      [GMPLS-   [GMPLS-
       RSVP]     LDP]
14.1    [ ]      [ ] Acceptable Label Set
14.2    [ ]          Notify Request Objects (GMPLS-RSVP)
14.3    [ ]          Notify Message (GMPLS-RSVP)
14.4    [ ]          Removing State with a PathErr message (GMPLS-RSVP)

15  Other features
      [GMPLS-   [GMPLS-
       RSVP]     LDP]
15.1    [ ]      [ ] Explicit Label Control
15.2    [ ]      [ ] Protection Information
15.3    [ ]      [ ] Administrative Status Information
15.4    [ ]      [ ] Interface Identification
15.5    [ ]      [ ] Errored Interface Identification
15.6    [ ]      [ ] Link Fault Handling
15.7    [ ]      [ ] Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:
17.1 related to [GMPLS-RSVP]
17.2 related to [GMPLS-LDP]
17.3 Other
```

18. Currently-defined GMPLS signaling features not supported:
18.1 related to [GMPLS-RSVP]
18.2 related to [GMPLS-LDP]
18.3 related to [GMPLS-SONET]
18.4 Other

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

Based on OIF UNI 1.0 Implementation Agreement, which is a subset of GMPLS but includes the most stable and commonly agreed features. The purpose of the implementation is for interoperability with client devices.

20. If you feel the above categories are not complete, add others which will better describe your project:

==========

Person filling out this form:

Name: as above
E-mail:
Tel.:
Title:
Company:
Date prepared: March 22, 2002

2.6. Data Connection Ltd

GMPLS Signaling Implementation Survey Form [V 1.0]

1. Organization:
Data Connection Ltd

1.1 Organization url(s):
www.dataconnection.com

2. Product title(s):
DC-MPLS

2.1 Brief description(s):
MPLS and GMPLS signaling software product, including RSVP, LDP, CR-LDP and OIF UNI support.

---

3. Contact for GMPLS information

3.1 Name:
Toby Eccles

3.2 Title:
MPLS Product Manager

3.3 E-mail:
thme@dataconnection.com

3.4 Organization/department:
Network Convergence Group

3.5 Postal address:
Data Connection Ltd
100 Church Street
Enfield
Middlesex
EN2 6BQ
UK

3.6 Phone:
+44 20 8366 1177

3.7 Fax:
+44 20 8363 1468
---

4. Status:
4.1 [ ] Development
4.2 [ ] Alpha
4.3 [ ] Beta
4.4 [X] Product
4.5 [ ] Other (describe):

5. Switching capabilities
5.1 [X] PSC
5.2 [X] TDM
5.3 [X] LSC
5.4 [X] FSC
DC-MPLS software can control all of these switching types.

6. Reference Drafts (please list, include version numbers)
Draft support is constantly being updated to the latest versions.

RFC 2205 Resource ReSerVation Protocol (RSVP)
RFC 2207 RSVP Extensions for IPSEC Data Flows
RFC 2208 Resource ReSerVation Protocol (RSVP) Version 1 Applicability Statement

RFC 2209 Resource ReSerVation Protocol (RSVP) Version 1 Message Processing Rules
RFC 2210 The Use of RSVP with IETF Integrated Services
RFC 2547 BGP/MPLS VPNs
RFC 2702 Requirements for Traffic Engineering Over MPLS
RFC 2745 RSVP Diagnostic Messages
RFC 2764 Framework for IP-based Virtual Private Networks
RFC 2961 RSVP Refresh Overhead Reduction Extensions
RFC 3031 Multiprotocol Label Switching Architecture
RFC 3032 MPLS Label Stack Encoding
RFC 3034 Use of Label Switching on Frame Relay Networks Specification

RFC 3035 MPLS using LDP and ATM VC Switching
RFC 3036 LDP specification
RFC 3037 LDP Applicability
RFC 3209 RSVP-TE: Extensions to RSVP for LSP Tunnels
RFC 3210 Applicability statement for the extensions to RSVP for LSP Tunnels
RFC 3212 Constraint-Based LSP Setup using LDP
RFC 3213 Applicability Statement for CR-LDP
draft-ietf-mpls-ldp-mib Definitions of Managed Objects for the Multiprotocol Label Switching Label Distribution Protocol (LDP)
draft-ietf-mpls-lsr-mib MPLS Label Switch Router Management Information Base Using SMIv2
draft-ietf-mpls-te-mib MPLS Traffic Engineering Management Information Base Using SMIv2
draft-ietf-mpls-generalized-signaling Generalized MPLS - Signaling Functional Description
draft-ietf-mpls-generalized-rsvp-te Generalized MPLS Signaling - RSVP-TE Extensions
draft-ietf-mpls-diff-ext MPLS Support of Differentiated Services
draft-ietf-mpls-lsp-hierarchy LSP Hierarchy with MPLS TE
draft-ietf-mpls-rsvp-unnum Signaling Unnumbered Links in RSVP-TE
draft-ietf-mpls-bundle Link Bundling in MPLS Traffic Engineering
draft-ietf-mpls-bundle-mib Link Bundling Management Information Base Using SMIv2
draft-ietf-mpls-tc-mib Definition of Textual Conventions and OBJECT-IDENTITIES for Multi-Protocol Label Switching (MPLS) Management
draft-ietf-mpls-mgmt-overview Multiprotocol Label Switching (MPLS) Management Overview
draft-ietf-mpls-rsvp-lsp-fastreroute-00.txt Fast Reroute Extensions to RSVP-TE for LSP Tunnels
draft-ietf-ccamp-gmpls- sonet-sdh GMPLS Extensions for SONET and SDH Control
draft-ietf-ccamp-gmpls- architecture Generalized Multi-Protocol Label Switching (GMPLS) Architecture
draft-ietf-ccamp-gmpls- sonet-sdh-extensions GMPLS Extensions to Control Non-Standard SONET and SDH Features

draft-iwata-mpls-crankback Crankback Routing Extensions for MPLS Signaling
draft-martini-l2circuit-trans- mpls Transport of Layer 2 Frames Over MPLS
draft-martini-l2circuit-encap-mpls Encapsulation Methods for Transport of Layer 2 Frames Over IP
draft-azad-mpls-oam-messaging MPLS user-plane OAM messaging

7. Interface technologies
7.1 [X] Frame Relay
7.2 [X] ATM
7.3 [X] Ethernet V2/DIX
7.4 [X] Ethernet 802.3
7.5 [X] SDH
7.6 [X] SONET
7.7 [X] Lambda (photonic)
7.8 [X] Fiber
7.9 [X] FiberChannel
7.10 [ ] Other (describe):
DC-MPLS software can handle all these interface types.

8. Availability
8.1 [ ] Public and free
8.2 [ ] Only to selected organizations/companies but free
8.3 [X] On sale.
8.4 [ ] For internal company use only
8.5 [ ] Other:

9. Implementation based on: (check all that apply)
9.1 [ ] Purchased code (please list source if possible)
9.2 [ ] Free code (please list source if possible)
9.3 [X] Internal implementation (no outside code, just from specs)
9.4 [X] Internal implementation on top of purchased or free code
9.4.1 [ ] List portions from external source
9.4.2 [ ] List portions developed internally
External code was used as a basis for the very initial development of the RSVP protocol piece for packet MPLS. All other components have been developed internally. Since then, all externally-derived code has been either rewritten or substantially revised and enhanced - it is now unrecognisable; also, large new components (including all the GMPLS protocol handling) have been developed purely from the specifications.

10. Supported Label Types
10.1 [X] MPLS Label
10.2 [X] Generalized Label
10.3 [X] Waveband Label
10.4 [X] SONET/SDH Label

11. Label Related
11.1 [X] Suggested Label
11.2 [X] Label Set

12. Traffic Parameters
12.1 [X] Intserv (Controlled load and Guaranteed service)
12.2 [X] CR-LDP
12.3 [X] GMPLS Bandwidth Encoding
12.4 [X] SONET/SDH

13. [X] Bidirectional LSPs

14. Notification
14.1 [ ] Acceptable Label Set
14.2 [X] Notify Request Objects (GMPLS-RSVP)
14.3 [X] Notify Message (GMPLS-RSVP)
14.4 [X] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features
15.1 [X] Explicit Label Control
15.2 [X] Protection Information
15.3 [X] Administrative Status Information
15.4 [X] Interface Identification
15.5 [ ] Errored Interface Identification
15.6 [X] Link Fault Handling
15.7 [X] Nodal Fault Handling

16. Other specification(s) which apply:
OIF2000.125 User Network Interface (UNI) 1.0 Signaling Specification

17. Other features supported:
Control plane restart (as in both the pan-restart and generalized-rsvp-te signalling drafts)
Fault tolerance (hot backup and persistent store)
Software distribution across distributed processing architectures
Protection switching
Bundled links
Non-associated (out of band) signaling
Graceful deletion
LSP hierarchy
Reverse LSPs
Diffserv
Resource affinities

18. Currently-defined GMPLS signaling features not supported:
Errored Interface Identification
Acceptable Label Set

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

DC-MPLS is a source code implementation of the MPLS, GMPLS, and OIF UNI protocols that has been architected, designed, coded and tested for the most demanding environments: high performance, unlimited scalability, resilience and fault tolerance have been designed in from the outset. It is in use with a large number of OEMs building a wide variety of types of switch, many of which are using GMPLS.

DCL also supplies implementations of LMP and IP routing protocols for implementation of a complete control plane.

20. If you feel the above categories are not complete, add others which will better describe your project:

==========

Person filling out this form:

Name:
Tim Hall

E-mail:
timhall@dataconnection.com

Tel.:
+44 20 8366 1177

Title:
DC-MPLS Development Manager

Company:
Data Connection Ltd.

Date prepared:
13th March 2002

2.7. Equipe Communications Corp.

GMPLS Signaling Implementation Survey Form [V 1.1]

1. Organization: Equipe Communications Corp.

1.1 Organization url(s): www.equipecom.com

2. Product title(s): E3200

2.1 Brief description(s): O-UNI implementation for Multi-service switch

---

3. Contact for GMPLS information

3.1 Name: Nik Langrind

3.2 Title: Prin SW Eng

3.3 E-mail: nik@equipecom.com

3.4 Organization/department: Engineering

3.5 Postal address: 100 Nagog Park, Acton MA 01720

3.6 Phone: (978) 795 2012

3.7 Fax: (978) 635 0095

---

4. Status:

4.1 [ ] Development
4.2 [x] Alpha
4.3 [ ] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities

	[GMPLS-RSVP]	[GMPLS-LDP]	
5.1	[x]	[ ]	PSC
5.2	[x]	[ ]	TDM
5.3	[ ]	[ ]	LSC
5.4	[ ]	[ ]	FSC

6. Reference Drafts (please list, include version numbers)

6.1 [ ] draft-ietf-mpls-generalized-signaling-08
6.2 [ ] draft-ietf-mpls-generalized-rsvp-te-07
6.3 [ ] draft-ietf-ccamp-gmpls-sonet-sdh-03
6.4 [ ] draft-ietf-ccamp-lmp-03
6.5 [ ] RFC2961 Refresh Reduction

7. Interface technologies

7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [ ] Ethernet 802.3

```
   7.5    [x] SDH
   7.6    [x] SONET
   7.7    [ ] Lambda (photonic)
   7.8    [ ] Fiber
   7.9    [ ] FiberChannel
   7.10   [ ] Other (describe):

   8. Availability
         [GMPLS-   [GMPLS-
          RSVP]     LDP]
   8.1    [ ]       [ ]  Public and free
   8.2    [ ]       [ ]  Only to selected organizations/companies but free
   8.3    [ ]       [ ]  On sale.
   8.4    [x]       [ ]  For internal company use only
   8.5    [ ]       [ ]  Other:

   9. Implementation based on:  (check all that apply)
         [GMPLS-   [GMPLS-
          RSVP]     LDP]
   9.1    [ ]       [ ]   Purchased code
                          (please list source if possible)
   9.2    [ ]       [ ]   Free code
                          (please list source if possible)
   9.3    [x]       [ ]   Internal implementation
                          (no outside code, just from specs)
   9.4    [ ]       [ ]   Internal implementation on top of purchased
                          or free code
   9.4.1                  List portions from external source:
                          (Identify protocol if appropriate)
   9.4.2                  List portions developed internally:
                          (Identify protocol if appropriate)

   10.  Supported Label Types
         [GMPLS-   [GMPLS-
          RSVP]     LDP]
   10.1   [ ]       [ ] MPLS Label
   10.2   [x]       [ ] Generalized Label
   10.3   [ ]       [ ] Waveband Label
   10.4   [x]       [ ] SONET/SDH Label

   11.  Label Related
         [GMPLS-   [GMPLS-
          RSVP]     LDP]
   11.1   [ ]       [ ] Suggested Label
   11.2   [ ]       [ ] Label Set

   12.  Traffic Parameters
         [GMPLS-   [GMPLS-
```

	[GMPLS-RSVP]	[GMPLS-LDP]	
12.1	[ ]		Intserv (Please list which)
12.2		[ ]	CR-LDP
12.3	[ ]	[ ]	GMPLS Bandwidth Encoding
12.4	[x]	[ ]	SONET/SDH

13. Bidirectional LSPs

	[GMPLS-RSVP]	[GMPLS-LDP]	
	[x]	[ ]	Bidirectional LSPs

14. Notification

	[GMPLS-RSVP]	[GMPLS-LDP]	
14.1	[ ]	[ ]	Acceptable Label Set
14.2	[x]		Notify Request Objects (GMPLS-RSVP)
14.3	[x]		Notify Message (GMPLS-RSVP)
14.4	[x]		Removing State with a PathErr message (GMPLS-RSVP)

15 Other features

	[GMPLS-RSVP]	[GMPLS-LDP]	
15.1	[ ]	[ ]	Explicit Label Control
15.2	[ ]	[ ]	Protection Information
15.3	[ ]	[ ]	Administrative Status Information
15.4	[ ]	[ ]	Interface Identification
15.5	[ ]	[ ]	Errored Interface Identification
15.6	[ ]	[ ]	Link Fault Handling
15.7	[ ]	[ ]	Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:
17.1 related to [GMPLS-RSVP]
17.2 related to [GMPLS-LDP]
17.3 Other

18. Currently-defined GMPLS signaling features not supported:

Suggested Label, Label Set etc.

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

The goal is to provide OIF O-UNI 1.0, User Side.

20. If you feel the above categories are not complete, add others which will better describe your project:

==========

Person filling out this form:

Name:	Nik Langrind
E-mail:	nik@equipecom.com
Tel.:	(978) 795-2012
Title:	Prin SW Eng
Company:	Equipe Communications Corp
Date prepared:	5/30/02

2.8. Firstwave Intelligent Optical Networks

GMPLS Signaling Implementation Survey Form [V 1.1]

1. Organization: FirstWave Intelligent Optical Networks

1.1 Organization url(s): http://www.fwion.com

2. Product title(s):

2.1 Brief description(s):

---

3. Contact for GMPLS information
3.1 Name: Michael Mandelberg

3.2 Title: Sr. MTS

3.3 E-mail: mmandelberg@fwion.com

3.4 Organization/department: Control Plane Embedded Software Group

3.5 Postal address: 6301 Ivy Lane, Suite 700, Greenbelt, MD 20770

3.6 Phone: (301) 345-2137 x1008

3.7 Fax: (301) 345-3612
---

4. Status:
4.1 [ ] Development
4.2 [x] Alpha
4.3 [ ] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities

	[GMPLS-RSVP]	[GMPLS-LDP]	
5.1	[ ]	[ ]	PSC
5.2	[ ]	[ ]	TDM
5.3	[x]	[x]	LSC
5.4	[x]	[x]	FSC

6. Reference Drafts (please list, include version numbers)

6.1 [x] [GMPLS-SIG]
6.2 [x] [GMPLS-RSVP]
6.3 [x] [GMPLS-LDP]
6.4 [ ] [GMPLS-SONET]
6.5 [x] draft-ietf-ccamp-lmp-03.txt
6.6 [x] draft-ietf-ccamp-gmpls-architecture-02.txt
6.7 [x] draft-ietf-ccamp-ospf-gmpls-extensions-04.txt
6.8 [x] draft-nadeau-ccamp-gmpls-label-mib-01.txt
6.9 [x] draft-nadeau-ccamp-gmpls-tc-mib-01.txt
6.10 [x] draft-nadeau-ccamp-gmpls-lsr-mib-01.txt
6.11 [x] draft-nadeau-ccamp-gmpls-te-mib-01.txt
6.12 [x] draft-ietf-mpls-lsp-hierarchy-04.txt
6.13 [x] draft-ietf-mpls-bundle-01.txt

7. Interface technologies

7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [ ] Ethernet 802.3
7.5 [ ] SDH
7.6 [ ] SONET
7.7 [x] Lambda (photonic)
7.8 [ ] Fiber
7.9 [ ] FiberChannel
7.10 [x] Other (describe): All optical and transparent to transport technology

8. Availability

	[GMPLS-RSVP]	[GMPLS-LDP]	
8.1	[ ]	[ ]	Public and free
8.2	[ ]	[ ]	Only to selected organizations/companies but free
8.3	[ ]	[ ]	On sale.
8.4	[x]	[x]	For internal company use only
8.5	[ ]	[ ]	Other:

9. Implementation based on: (check all that apply)

	[GMPLS-RSVP]	[GMPLS-LDP]

9.1	[ ]	[ ]	Purchased code (please list source if possible)
9.2	[ ]	[ ]	Free code (please list source if possible)
9.3	[x]	[x]	Internal implementation (no outside code, just from specs)
9.4	[ ]	[ ]	Internal implementation on top of purchased or free code
9.4.1			List portions from external source: (Identify protocol if appropriate)
9.4.2			List portions developed internally: (Identify protocol if appropriate)

10. Supported Label Types

	[GMPLS-RSVP]	[GMPLS-LDP]	
10.1	[ ]	[ ]	MPLS Label
10.2	[x]	[x]	Generalized Label
10.3	[x]	[x]	Waveband Label
10.4	[ ]	[ ]	SONET/SDH Label

11. Label Related

	[GMPLS-RSVP]	[GMPLS-LDP]	
11.1	[x]	[x]	Suggested Label
11.2	[x]	[x]	Label Set

12. Traffic Parameters

	[GMPLS-RSVP]	[GMPLS-LDP]	
12.1	[ ]	[ ]	Intserv (Please list which)
12.2	[x]	[x]	CR-LDP
12.3	[x]	[x]	GMPLS Bandwidth Encoding
12.4	[ ]	[ ]	SONET/SDH

13. Bidirectional LSPs

[GMPLS-RSVP]	[GMPLS-LDP]	
[x]	[x]	Bidirectional LSPs

14. Notification

	[GMPLS-RSVP]	[GMPLS-LDP]	
14.1	[x]	[x]	Acceptable Label Set
14.2	[x]		Notify Request Objects (GMPLS-RSVP)
14.3	[x]		Notify Message (GMPLS-RSVP)
14.4	[x]		Removing State with a PathErr message (GMPLS-RSVP)

15 Other features

	[GMPLS-RSVP]	[GMPLS-LDP]	
15.1	[x]	[x]	Explicit Label Control
15.2	[x]	[x]	Protection Information
15.3	[x]	[x]	Administrative Status Information
15.4	[x]	[x]	Interface Identification
15.5	[x]	[x]	Errored Interface Identification
15.6	[x]	[x]	Link Fault Handling
15.7	[x]	[x]	Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:
17.1 related to [GMPLS-RSVP]
17.2 related to [GMPLS-LDP]
17.3 Other

18. Currently-defined GMPLS signaling features not supported:
18.1 related to [GMPLS-RSVP]
18.2 related to [GMPLS-LDP]
18.3 related to [GMPLS-SONET]
18.4 Other

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which will better describe your project:

==========

Person filling out this form:

Name: Michael Mandelberg
E-mail: mmandelberg@fwion.com
Tel.: (301) 345-2137 x1008
Title: Sr. MTS
Company: FirstWave Intelligent Optical Networks
Date prepared: 3-15-02

2.9. HCL Technologies Ltd., India

GMPLS Signaling Implementation Survey Form [V 1.0]

1. Organization: HCL TECHNOLOGIES LTD., INDIA

1.1 Organization url(s): www.hcltechnologies.com (Corporate Website)

2. Product title(s): HCL LMP , HCL RSVP-TE

2.1 Brief description(s):

* HCL LMP:-
++++++++++++

The design and implementation of the product is as per the working draft mentioned for Link Management Protocol. This product includes all the features irrespective of optional and mandatory procedures. Specific API implementation is also being done in order to match different possible environments in which it can be used.

* HCL RSVP-TE:-
++++++++++++++++
This product is being developed internally for Signalling and LSP establishment in GMPLS Environment. The design and implementation is done on top of existing base RSVP (RFC 2205) implementation, by adding provisions so that it can be used for Signalling & LSP establishment in GMPLS scenario. This product can work standalone as GMPLS RSVP TE stack as well as in regular IP Resource Reservation environment & in MPLS Label Distribution and LSP establishment environment.

---

3. Contact for GMPLS information

3.1 Name: S. Shankar

3.2 Title: Project Manager

3.3 E-mail: shanky@npd.hcltech.com

3.4 Organization/department: HCL Technologies Limited,
Networking Products Division

3.5 Postal address: 49-50 Nelson Manickam Road, Chennai - 600029,
India

3.6 Phone: +91-44-3741939

3.7 Fax: +91-44-3741038

---

4. Status:
4.1 [*] Development
4.2 [ ] Alpha
4.3 [ ] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities
5.1 [ ] PSC
5.2 [*] TDM
5.3 [ ] LSC
5.4 [ ] FSC

6. Reference Drafts (please list, include version numbers)
6.1 [*] draft-ietf-ccamp-lmp-02.txt
6.2 [*] draft-ietf-ccamp-gmpls-sonet-sdh-03.txt
6.3 [*] draft-ietf-ccamp-gmpls-architecture-02.txt
6.4 [*] draft-ietf-mpls-generalized-rsvp-te-06.txt
6.5 [*] draft-ietf-mpls-rsvp-unnum-04.txt
6.6 [*] draft-ietf-mpls-bundle-01.txt
6.7 [*] rfc3209.txt
6.9 [*] rfc2205.txt
7.0 [*] rfc2961.txt
7.1 [*] draft-ietf-mpls-generalized-signaling-07

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [ ] Ethernet 802.3
7.5 [*] SDH
7.6 [*] SONET
7.7 [ ] Lambda (photonic)
7.8 [ ] Fiber
7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability
8.1 [ ] Public and free
8.2 [ ] Only to selected organizations/companies but free

8.3 [ ] On sale.
8.4 [ ] For internal company use only
8.5 [*] Other:

9. Implementation based on: (check all that apply)
9.1 [ ] Purchased code (please list source if possible)
9.2 [ ] Free code (please list source if possible)
9.3 [ ] Internal implementation (no outside code, just from specs)
9.4 [*] Internal implementation on top of purchased or free code
9.4.1 [*] List portions from external source
RSVP base code implemented by ISI. Conformance to RFC 2205

9.4.2 [*] List portions developed internally
GMPLS RSVP TE Extensions (As per Drafts)
LMP

10. Supported Label Types
10.1 [ ] MPLS Label
10.2 [*] Generalized Label
10.3 [ ] Waveband Label
10.4 [*] SONET/SDH Label

11. Label Related
11.1 [ ] Suggested Label
11.2 [*] Label Set

12. Traffic Parameters
12.1 [*] Intserv (Please list which)
12.2 [ ] CR-LDP
12.3 [*] GMPLS Bandwidth Encoding
12.4 [*] SONET/SDH

13. [*] Bidirectional LSPs

14. Notification
14.1 [*] Acceptable Label Set
14.2 [ ] Notify Request Objects (GMPLS-RSVP)
14.3 [ ] Notify Message (GMPLS-RSVP)
14.4 [*] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features
15.1 [*] Explicit Label Control
15.2 [ ] Protection Information
15.3 [*] Administrative Status Information
15.4 [*] Interface Identification
15.5 [*] Errored Interface Identification
15.6 [*] Link Fault Handling
15.7 [*] Nodal Fault Handling

16. Other specification(s) which apply: OIF-UNI-01.0

17. Other features supported:
    a) RECOVERY_LABEL as per OIF UNI specification
    b) Service Discovery as per OIF UNI specification

18. Currently-defined GMPLS signaling features not supported:
    a) Channel Status procedure

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which will better describe your project:

==========

Person filling out this form:

Name: S. Shankar
E-mail: shanky@npd.hcltech.com
Tel.: +91-44-374-1939
Title: Project Manager
Company: HCL Technologies Limited,
Networking Products Division
Date prepared: 13-March-2002

2.10. Intel Corporation

GMPLS Signaling Implementation Survey Form [V 1.0]

1. Organization: Intel Corporation

1.1 Organization url(s):htp://www.intel.com

2. Product title(s):Intelligent Optical Networking using GMPLS

2.1 Brief description(s):

The product utilizes the benefits of GMPLS to provision smart, scalable and extensible Optical Networks.

---

3. Contact for GMPLS information
3.1 Name:Christian Maciocco, Manav Mishra

3.2 Title:

3.3 E-mail:christian.maciocco@intel.com;manav.mishra@intel.com

3.4 Organization/department:Intel Labs

3.5 Postal address:2111 NE 25th Avenue, Hillsboro, OR 97124

3.6 Phone:503-712-1843

3.7 Fax:503-264-3483

---

4. Status:
4.1 [X] Development
4.2 [ ] Alpha
4.3 [ ] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities
5.1 [X] PSC
5.2 [X] TDM
5.3 [ ] LSC
5.4 [ ] FSC

6. Reference Drafts (please list, include version numbers)
6.1 [http://www.ietf.org/internet-drafts/draft-ietf-mpls-generalized-rsvp-te-06.txt]
6.2 [http://www.ietf.org/internet-drafts/draft-ietf-ccamp-gmpls-sonet-sdh-02.txt]
6.3 [http://www.ietf.org/internet-drafts/draft-ietf-ccamp-gmpls-architecture-01.txt]
6.4 [http://www.ietf.org/internet-drafts/draft-ietf-mpls-generalized-signaling-07.txt]
6.5 [http://www.ietf.org/internet-drafts/draft-ietf-ccamp-lmp-02.txt]
6.6 [ ]

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [X] ATM
7.3 [X] Ethernet V2/DIX
7.4 [X] Ethernet 802.3
7.5 [X] SDH
7.6 [X] SONET
7.7 [ ] Lambda (photonic)
7.8 [ ] Fiber
7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability

8.1 [ ] Public and free

8.2 [ ] Only to selected organizations/companies but free
8.3 [ ] On sale.
8.4 [ ] For internal company use only
8.5 [X] Other:

9. Implementation based on: (check all that apply)
9.1 [ ] Purchased code (please list source if possible)
9.2 [ ] Free code (please list source if possible)
9.3 [X] Internal implementation (no outside code, just from specs)
9.4 [ ] Internal implementation on top of purchased or free code
9.4.1 [ ] List portions from external source
9.4.2 [ ] List portions developed internally

10. Supported Label Types
10.1 [X] MPLS Label
10.2 [X] Generalized Label
10.3 [ ] Waveband Label
10.4 [X] SONET/SDH Label

11. Label Related
11.1 [ ] Suggested Label
11.2 [X] Label Set

12. Traffic Parameters
12.1 [X] Intserv (Please list which) RSVP-TE
12.2 [ ] CR-LDP
12.3 [X] GMPLS Bandwidth Encoding
12.4 [X] SONET/SDH

13. [X] Bidirectional LSPs

14. Notification
14.1 [X] Acceptable Label Set
14.2 [X] Notify Request Objects (GMPLS-RSVP)
14.3 [X] Notify Message (GMPLS-RSVP)
14.4 [X] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features
15.1 [X] Explicit Label Control
15.2 [X] Protection Information
15.3 [X] Administrative Status Information
15.4 [ ] Interface Identification
15.5 [ ] Errored Interface Identification
15.6 [X] Link Fault Handling
15.7 [X] Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:

18. Currently-defined GMPLS signaling features not supported:

Acceptable Label Set, Suggested Label Set, Contention resolution, non-standard SONET/SDH extensions to GMPLS.

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which will better describe your project:

Real World Deployment scenarios-- To get a fair idea as to how the real world sees GMPLS deployment to happen. How does GMPLS sees quick fail-over support to be provided to non-SONET/SDH networks.

==========

Person filling out this form:

Name:Manav Mishra
E-mail:manav.mishra@intel.com
Tel.:503-712-1843
Title:Senior Network Software Engineer
Company:Intel Corporation
Date prepared:03/12/2002

2.11. Japan Telecom Co., Ltd.

GMPLS Signaling Implementation Survey Form [V 1.0]

1. Organization:

JAPAN TELECOM CO., LTD.

1.1 Organization url(s):

http://www.icl.japan-telecom.co.jp

2. Product title(s):

JT's virtual GMPLS signaling node

2.1 Brief description(s):

JT's virtual GMPLS signaling node is a GMPLS signaling emulator running on Linux/UNIX environment in order to do some GMPLS signaling tests.

---

3. Contact for GMPLS information

3.1 Name:

Hirokazu Ishimatsu

3.2 Title:

Assistant Manager

3.3 E-mail:

hirokazu@japan-telecom.co.jp

3.4 Organization/department:

Information and Communication Laboratories

3.5 Postal address:

Shuwa Higashi Yaesu Bldg., 5F
2-9-1 Hachobori, Chuo-ku, Tokyo, 104-0032 Japan

3.6 Phone:

+81 3 5540 8493

3.7 Fax:

+81 3 5540 8485

---

4. Status:

4.1 [X] Development
4.2 [ ] Alpha
4.3 [ ] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities

5.1 [ ] PSC
5.2 [ ] TDM

5.3 [ ] LSC
5.4 [ ] FSC

6. Reference Drafts (please list, include version numbers)
6.1 draft-ietf-ccamp-ospf-gmpls-extentions-00.txt
6.2 draft-ietf-mpls-generalized-signaling-07.txt
6.3 draft-ietf-mpls-generalized-rsvp-te-06.txt
6.4 draft-ietf-ccamp-lmp-02.txt
6.5 [ ]
6.6 [ ]

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [X] Ethernet 802.3 for singaling channel
7.5 [ ] SDH
7.6 [ ] SONET
7.7 [ ] Lambda (photonic)
7.8 [ ] Fiber
7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability
8.1 [ ] Public and free
8.2 [ ] Only to selected organizations/companies but free
8.3 [ ] On sale.
8.4 [X] For internal company use only
8.5 [ ] Other:

9. Implementation based on: (check all that apply)
9.1 [ ] Purchased code (please list source if possible)
9.2 [ ] Free code (please list source if possible)
9.3 [X] Internal implementation (no outside code, just from specs)
9.4 [ ] Internal implementation on top of purchased or free code
9.4.1 [ ] List portions from external source
9.4.2 [ ] List portions developed internally

10. Supported Label Types
10.1 [ ] MPLS Label
10.2 [X] Generalized Label
10.3 [ ] Waveband Label
10.4 [ ] SONET/SDH Label

11. Label Related
11.1 [X] Suggested Label
11.2 [ ] Label Set

12. Traffic Parameters
12.1 [X] Intserv (Please list which)

PATH
Session
IF_ID RSVP Hop
Time Values
Sender Template
Sender Tspec
Message_ID/Message_ID_ACK/Message_ID_NACK
ERO
RRO
Generalized Label Request (LSC/FSC only)
Suggested Label
Upstream Label
Recovery Label
Protection
Notify Req
AdminStatus

PATHErr
Session
Sender Template
Sender Tspec
Message_ID/Message_ID_ACK/Message_ID_NACK
ErrorSpec
RRO

RESV
Session
Time Values
Message_ID/Message_ID_ACK/Message_ID_NACK
IF_ID RSVP Hop
Resv Confirm
Notify Request
AdminStatus
Style (FF or SE)
Flowspec
Filterspec
RSVP Label
RRO
Generalized Label

RESVErr
Session
IF_ID RSVP Hop
Message_ID/Message_ID_ACK/Message_ID_NACK
ErrorSpec

Style (FF and SE)

12.2 [ ] CR-LDP
12.3 [X] GMPLS Bandwidth Encoding
12.4 [ ] SONET/SDH

13. [X] Bidirectional LSPs

14. Notification
14.1 [ ] Acceptable Label Set
14.2 [ ] Notify Request Objects (GMPLS-RSVP)
14.3 [ ] Notify Message (GMPLS-RSVP)
14.4 [ ] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features
15.1 [X] Explicit Label Control
15.2 [X] Protection Information
15.3 [ ] Administrative Status Information
15.4 [ ] Interface Identification
15.5 [ ] Errored Interface Identification
15.6 [ ] Link Fault Handling
15.7 [ ] Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:

18. Currently-defined GMPLS signaling features not supported:

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

GMPLS lab tests & field trial

20. If you feel the above categories are not complete, add others which will better describe your project:

2.12. Juniper Networks

GMPLS Signaling Implementation Survey Form [V 1.0]

1. Organization: Juniper Networks

1.1 Organization url(s): www.juniper.net

2. Product title(s): GMPLS signaling

2.1 Brief description(s):

This implementation aims at being able to dynamically signal generalized LSPs initiated by the router, across an optical core. It uses RSVP for signaling. The initial focus is on the signaling aspects rather than routing in a GMPLS domain. The purpose is to come up with an interoperable signaling solution and then move forward. The attributes for the label-switched path (encoding type, bandwidth, switching type; etc) will be configurable on the router, and will be translated into an appropriate RSVP signaling request. Bidirectional LSP setup is supported and so is control-data plane separation. Other specifics are listed below.

- ---

3. Contact for GMPLS information

3.1 Name: Arthi Ayyangar

3.2 Title: Member of Technical Staff

3.3 E-mail: arthi@juniper.net

3.4 Organization/department: Engineering / Software

3.5 Postal address: 1194 N. Mathilda Ave, Sunnyvale, CA 94089

3.6 Phone: (408) 745 2110

3.7 Fax: (408) 745 8905

-

---

4. Status:

4.1 [ ] Development
4.2 [ ] Alpha
4.3 [*] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities

5.1 [*] PSC
5.2 [ ] TDM
5.3 [ ] LSC
5.4 [ ] FSC

6. Reference Drafts (please list, include version numbers)

6.1 [*] draft-ietf-mpls-generalized-signaling-07.txt

6.2 [*] draft-ietf-mpls-generalized-rsvp-te-06.txt
6.3 [*] draft-ietf-mpls-lsp-hierarchy-04.txt (portions of this)
6.4 [*] draft-ietf-mpls-bundle-01.txt
6.5 [*] draft-ietf-ccamp-gmpls-sonet-sdh-03.txt
6.6 [*] IANA proposed values sent by Lou

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [*] Ethernet V2/DIX
7.4 [*] Ethernet 802.3
7.5 [*] SDH
7.6 [*] SONET
7.7 [ ] Lambda (photonic)
7.8 [ ] Fiber
7.9 [ ] FiberChannel
7.10 [*] Other (describe): Packet

8. Availability
8.1 [ ] Public and free
8.2 [ ] Only to selected organizations/companies but free
8.3 [ ] On sale.
8.4 [*] For internal company use only
8.5 [*] Other: Field trials

9. Implementation based on: (check all that apply)
9.1 [ ] Purchased code (please list source if possible)
9.2 [ ] Free code (please list source if possible)
9.3 [*] Internal implementation (no outside code, just from specs)
9.4 [ ] Internal implementation on top of purchased or free code
9.4.1 [ ] List portions from external source
9.4.2 [ ] List portions developed internally

10. Supported Label Types
10.1 [*] MPLS Label
10.2 [*] Generalized Label
10.3 [ ] Waveband Label
10.4 [*] SONET/SDH Label

11. Label Related
11.1 [*] Suggested Label
11.2 [ ] Label Set

12. Traffic Parameters
12.1 [*] Intserv (Please list which) (Token Bucket)
12.2 [ ] CR-LDP
12.3 [*] GMPLS Bandwidth Encoding
12.4 [*] SONET/SDH

13. [*] Bidirectional LSPs

14. Notification
14.1 [ ] Acceptable Label Set
14.2 [ ] Notify Request Objects (GMPLS-RSVP)
14.3 [ ] Notify Message (GMPLS-RSVP)
14.4 [ ] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features
15.1 [ ] Explicit Label Control
15.2 [*] Protection Information
15.3 [ ] Administrative Status Information
15.4 [*] Interface Identification
15.5 [*] Errored Interface Identification
15.6 [ ] Link Fault Handling
15.7 [ ] Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:

18. Currently-defined GMPLS signaling features not supported:
** Graceful restart (link and node failures),
** Notify
** Admin Status

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which will better describe your project:
** Control channel separation
** Refresh reduction

==========

Person filling out this form:

Name: Arthi Ayyangar
E-mail: arthi@juniper.net
Tel.: (408) 745 2110
Title: Member of Techical Staff
Company: Juniper Networks
Date prepared: 03/12/02

2.13. Lumentis AB

GMPLS Signaling Implementation Survey Form [V 1.0]

1. Organization: Lumentis AB

1.1 Organization url(s): www.lumentis.se

2. Product title(s): Mentis systems

2.1 Brief description(s): DWDM systems for the metro environment

---

3. Contact for GMPLS information
3.1 Name: Mats Dahlgren

3.2 Title:

3.3 E-mail: Mats.Dahlgren@lumentis.se

3.4 Organization/department: Lumentis AB

3.5 Postal address: Jakobsdalsgatan 17, SE-12653 Hagersten, Sweden

3.6 Phone: +46 8 52 76 75 50

3.7 Fax: +46 8 52 76 75 99
---

4. Status:
4.1 [x] Development
4.2 [ ] Alpha
4.3 [ ] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities
5.1 [ ] PSC
5.2 [ ] TDM
5.3 [x] LSC
5.4 [ ] FSC

6. Reference Drafts (please list, include version numbers)
6.1 [ ]
6.2 [ ]
6.3 [ ]
6.4 [ ]

6.5 [ ]
6.6 [ ]

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [ ] Ethernet 802.3
7.5 [ ] SDH
7.6 [ ] SONET
7.7 [x] Lambda (photonic)
7.8 [ ] Fiber
7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability
8.1 [ ] Public and free
8.2 [ ] Only to selected organizations/companies but free
8.3 [ ] On sale.
8.4 [x] For internal company use only
8.5 [ ] Other:

9. Implementation based on: (check all that apply)

9.1 [ ] Purchased code (please list source if possible)
9.2 [ ] Free code (please list source if possible)
9.3 [ ] Internal implementation (no outside code, just from specs)
9.4.1 [X] List portions from external source
OSPFv2
9.4.2 [X] List portions developed internally
OSPF-TE
RSVP-TE
LMP

10. Supported Label Types
10.1 [ ] MPLS Label
10.2 [x] Generalized Label
10.3 [ ] Waveband Label
10.4 [ ] SONET/SDH Label

11. Label Related
11.1 [ ] Suggested Label
11.2 [ ] Label Set

12. Traffic Parameters
12.1 [ ] Intserv (Please list which)
12.2 [ ] CR-LDP
12.3 [x] GMPLS Bandwidth Encoding

12.4 [ ] SONET/SDH

13. [x] Bidirectional LSPs

14. Notification
14.1 [ ] Acceptable Label Set
14.2 [ ] Notify Request Objects (GMPLS-RSVP)
14.3 [ ] Notify Message (GMPLS-RSVP)
14.4 [ ] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features
15.1 [ ] Explicit Label Control
15.2 [ ] Protection Information
15.3 [ ] Administrative Status Information
15.4 [ ] Interface Identification
15.5 [ ] Errored Interface Identification
15.6 [ ] Link Fault Handling
15.7 [ ] Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:

18. Currently-defined GMPLS signaling features not supported:

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which will better describe your project:

==========

Person filling out this form:

Name: see contact for GMPLS information
E-mail:
Tel.:
Title:
Company:
Date prepared: 03/13/02

2.14. Marconi

GMPLS Signaling Implementation Survey Form [V 1.0]

1. Organization: Marconi.

1.1 Organization url(s): www.marconi.com

2. Product title(s): Transport Network Control Plane

2.1 Brief description(s):
Unified Control Plane for the SDH/SONET/Photonics product family

---

3. Contact for GMPLS information
3.1 Name: Piergiorgio Sessarego

3.2 Title: ASON Strategy Director

3.3 E-mail: piergiorgio.sessarego@marconi.com

3.4 Organization/department: ASON Strategy

3.5 Postal address: Via A. Negrone 1/A 16153 Cornigliano (GE) Italy

3.6 Phone: +390106003902

3.7 Fax:

---

4. Status:
4.1 [X] Development
4.2 [ ] Alpha
4.3 [ ] Beta
4.4 [ ] Product
4.5 [X] Other (describe): An early GMPLS development is in place in a photonic ring of Marconi equipment (PMA-32)

5. Switching capabilities
5.1 [ ] PSC
5.2 [X] TDM
5.3 [X] LSC
5.4 [X] FSC

6. Reference Drafts (please list, include version numbers)
6.1 [draft-ietf-ccamp-gmpls-architecture-01]

6.2 [draft-ietf-mpls-generalized-signaling-07]
6.3 [draft-ietf-mpls-generalized-rsvp-te-06]
6.4 [draft-ietf-ccamp-gmpls-sonet-sdh-02]
6.5 [draft-ietf-mpls-rsvp-unnum-03]
6.6 [draft-ietf-mpls-lsp-hierarchy-04]
6.7 [draft-ietf-mpls-bundle-01]

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [ ] Ethernet 802.3
7.5 [X] SDH
7.6 [X] SONET
7.7 [X] Lambda (photonic)
7.8 [X] Fiber
7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability
8.1 [ ] Public and free
8.2 [ ] Only to selected organizations/companies but free
8.3 [X] On sale.
8.4 [ ] For internal company use only
8.5 [ ] Other:

9. Implementation based on: (check all that apply)
9.1 [ ] Purchased code (please list source if possible)
9.2 [ ] Free code (please list source if possible)
9.3 [X] Internal implementation (no outside code, just from specs)
9.4 [ ] Internal implementation on top of purchased or free code
9.4.1 [ ] List portions from external source
9.4.2 [ ] List portions developed internally

10. Supported Label Types
10.1 [ ] MPLS Label
10.2 [X] Generalized Label
10.3 [X] Waveband Label
10.4 [X] SONET/SDH Label

11. Label Related
11.1 [ ] Suggested Label
11.2 [X] Label Set

12. Traffic Parameters
12.1 [ ] Intserv (Please list which)
12.2 [ ] CR-LDP
12.3 [X] GMPLS Bandwidth Encoding

12.4 [X] SONET/SDH

13. [X] Bidirectional LSPs

14. Notification
14.1 [X] Acceptable Label Set
14.2 [X] Notify Request Objects (GMPLS-RSVP)
14.3 [X] Notify Message (GMPLS-RSVP)
14.4 [X] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features
15.1 [X] Explicit Label Control
15.2 [X] Protection Information
15.3 [X] Administrative Status Information
15.4 [X] Interface Identification
15.5 [X] Errored Interface Identification
15.6 [X] Link Fault Handling
15.7 [X] Nodal Fault Handling

16. Other specification(s) which apply:
OIF 1.0

17. Other features supported:

18. Currently-defined GMPLS signaling features not supported:

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which will better describe your project:

==========

Person filling out this form:

Name: Diego Caviglia
E-mail: diego.caviglia@marconi.com
Tel.: +390106003808
Title: ASON Strategy
Company: Marconi
Date prepared: 11/03/02

2.15. Movaz Networks

GMPLS Signaling Implementation Survey Form [V 1.0]

1. Organization: Movaz Networks.

1.1 Organization url(s): www.movaz.com

2. Product title(s): RAYstar, RAYexpress

2.1 Brief description(s):

RAYstar integrates the values of a very-high-density OADM (optical add/drop multiplexer) and a compact, distributed optical switching platform into a single 7 foot bay.

The RAYexpress OADM (optical add/drop multiplexer) provides a versatile, cost effective, and compact platform for wavelength services in access and regional applications.

---

3. Contact for GMPLS information

3.1 Name: Adrian Farrel

3.2 Title: Director Protocol Development

3.3 E-mail: afarrel@movaz.com

3.4 Organization/department:

3.5 Postal address: 7926 Jones Branch Drive
Suite 615
McLean, VA 22102

3.6 Phone: 703-847-1867

3.7 Fax: 703-847-3975

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4. Status:

4.1 [ ] Development

4.2 [ ] Alpha

4.3 [ ] Beta

4.4 [x] Product

Swi [ ] Other (describe):

5. Switching capabilities

5.1 [ ] PSC
5.2 [x] TDM
5.3 [x] LSC
5.4 [x] FSC

6. Reference Drafts (please list, include version numbers)
6.1 draft-ietf-mpls-generalized-signaling-07.txt
6.2 draft-ietf-mpls-generalized-rsvp-te-06.txt
6.3 draft-ietf-ccamp-gmpls-sonet-sdh-03.txt
6.4 RFC3209
6.5 RFC2961
6.6 RFC2205
6.7 draft-nadeau-ccamp-gmpls-tc-mib-01.txt
6.8 draft-nadeau-ccamp-gmpls-te-mib-01.txt

Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [ ] Ethernet 802.3
7.5 [x] SDH
7.6 [x] SONET
7.7 [x] Lambda (photonic)
7.8 [x] Fiber
7.9 [ ] FiberChannel
7.10 [x] Other (describe):
GigEthernet

8.1 [ ] Public and free
8.2 [ ] Only to selected organizations/companies but free
8.3 [x] On sale.
8.4 [ ] For internal company use only
8.5 [ ] Other:

9. Implementation based on: (check all that apply)
9.1 [ ] Purchased code (please list source if possible)
9.2 [ ] Free code (please list source if possible)
9.3 [ ] Internal implementation (no outside code, just from specs)
9.4 [x] Internal implementation on top of purchased or free code
9.4.1 [ ] List portions from external source
Base RSVP-TE code from LabN
9.4.2 [ ] List portions developed internally
RSVP-TE for GMPLS
MIB support

10. Supported Label Types
10.1 [ ] MPLS Label
10.2 [x] Generalized Label

10.3 [ ] Waveband Label
10.4 [x] SONET/SDH Label

11. Label Related
11.1 [x] Suggested Label
11.2 [x] Label Set

12. Traffic Parameters
12.1 [ ] Intserv (Please list which)
12.2 [ ] CR-LDP
12.3 [x] GMPLS Bandwidth Encoding
12.4 [x] SONET/SDH

13. [x] Bidirectional LSPs

14. Notification
14.1 [x] Acceptable Label Set
14.2 [x] Notify Request Objects (GMPLS-RSVP)
14.3 [x] Notify Message (GMPLS-RSVP)
14.4 [x] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features
15.1 [x] Explicit Label Control
15.2 [x] Protection Information
15.3 [x] Administrative Status Information
15.4 [x] Interface Identification
15.5 [x] Errored Interface Identification
15.6 [x] Link Fault Handling
15.7 [x] Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:
OSPF and OSPF extensions for TE and GMPLS

18. Currently-defined GMPLS signaling features not supported:
CR-LDP

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which will better describe your project:

==========

Person filling out this form:

Name: Adrian Farrel
E-mail:
Tel.:
Title:
Company:
Date prepared: 3/13/02

2.16. NEC Corporation

GMPLS Signaling Implementation Survey Form [V 1.1]

1. Organization:

NEC Corporation

1.1 Organization url(s):

www.nec.com

2. Product title(s):
SpectralWave Networking Software for U-Node, DWDM

2.1 Brief description(s):

SpectralWave family supports crossconnects on SDH/SONET and wavelength multiplexing for metro and core network with GMPLS/ASON based control plane.

---

3. Contact for GMPLS information
3.1 Name:
Su-Hun YUN

3.2 Title:
Assistant Manager

3.3 E-mail:
s-yun@bl.jp.nec.com

3.4 Organization/department:
Systems Development Department
First Optical Network Division

3.5 Postal address:
1753 Shimonumabe Nakahara-ku

Kawasaki, 211-8666, Japan

3.6 Phone:
+81 44 396 3247

3.7 Fax:
+81 44 435 5161

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4. Status:
4.1 [ ] Development
4.2 [ ] Alpha
4.3 [X] Beta
4.4 [X] Product
4.5 [ ] Other (describe):

5. Switching capabilities

	[GMPLS-RSVP]	[GMPLS-LDP]	
5.1	[ ]	[ ]	PSC
5.2	[X]	[ ]	TDM
5.3	[ ]	[ ]	LSC
5.4	[ ]	[ ]	FSC

6. Reference Drafts (please list, include version numbers)

6.1 [X] draft-ietf-mpls-generalized-signaling-08.txt
6.2 [X] draft-ietf-mpls-generalized-rsvp-te-07.txt
6.3 [X] draft-ietf-ccamp-gmpls-sonet-sdh-05.txt
6.4 [X] draft-ietf-mpls-rsvp-unnum-02.txt
6.5 [X] draft-ietf-mpls-bundle-03.txt

6.6 [X] draft-ietf-mpls-lmp-02.txt

6.7 [X] draft-ietf-ccamp-gmpls-routing-04.txt
6.8 [X] draft-ietf-ccamp-ospf-gmpls-extensions-07.txt

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [X] Ethernet V2/DIX
7.4 [X] Ethernet 802.3
7.5 [X] SDH
7.6 [X] SONET
7.7 [ ] Lambda (photonic)
7.8 [ ] Fiber

7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability

	[GMPLS-RSVP]	[GMPLS-LDP]	
8.1	[ ]	[ ]	Public and free
8.2	[ ]	[ ]	Only to selected organizations/companies but free
8.3	[X]	[ ]	On sale.
8.4	[ ]	[ ]	For internal company use only
8.5	[ ]	[ ]	Other:

9. Implementation based on: (check all that apply)

	[GMPLS-RSVP]	[GMPLS-LDP]	
9.1	[X]	[ ]	Purchased code (please list source if possible)
9.2	[ ]	[ ]	Free code (please list source if possible)
9.3	[X]	[ ]	Internal implementation (no outside code, just from specs)
9.4	[X]	[ ]	Internal implementation on top of purchased or free code
9.4.1			List portions from external source: (Identify protocol if appropriate)
9.4.2			List portions developed internally: (Identify protocol if appropriate)

10. Supported Label Types

	[GMPLS-RSVP]	[GMPLS-LDP]	
10.1	[ ]	[ ]	MPLS Label
10.2	[ ]	[ ]	Generalized Label
10.3	[ ]	[ ]	Waveband Label
10.4	[X]	[ ]	SONET/SDH Label

11. Label Related

	[GMPLS-RSVP]	[GMPLS-LDP]	
11.1	[X]	[ ]	Suggested Label
11.2	[X]	[ ]	Label Set

12. Traffic Parameters

	[GMPLS-RSVP]	[GMPLS-LDP]	
12.1	[ ]		Intserv (Please list which)
12.2		[ ]	CR-LDP
12.3	[X]	[ ]	GMPLS Bandwidth Encoding

12.4 [X] [ ] SONET/SDH

13. Bidirectional LSPs

	[GMPLS-RSVP]	[GMPLS-LDP]	
	[X]	[ ]	Bidirectional LSPs

14. Notification

	[GMPLS-RSVP]	[GMPLS-LDP]	
14.1	[ ]	[ ]	Acceptable Label Set
14.2	[X]		Notify Request Objects (GMPLS-RSVP)
14.3	[X]		Notify Message (GMPLS-RSVP)
14.4	[X]		Removing State with a PathErr message (GMPLS-RSVP)

15 Other features

	[GMPLS-RSVP]	[GMPLS-LDP]	
15.1	[X]	[ ]	Explicit Label Control
15.2	[X]	[ ]	Protection Information
15.3	[X]	[ ]	Administrative Status Information
15.4	[X]	[ ]	Interface Identification
15.5	[X]	[ ]	Errored Interface Identification
15.6	[X]	[ ]	Link Fault Handling
15.7	[X]	[ ]	Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:
17.1 related to [GMPLS-RSVP]

OIF UNI 1.0 is supported.

17.2 related to [GMPLS-LDP]
17.3 Other

18. Currently-defined GMPLS signaling features not supported:
18.1 related to [GMPLS-RSVP]
18.2 related to [GMPLS-LDP]
18.3 related to [GMPLS-SONET]
18.4 Other

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which will better describe your project:

As a part of SpectralWave Networking Software, SepctralWave Control Plane fully controls SpectralWave DWDM and U-Node by interacting with SpectralWave Manager (NMS) and SpectralWave Planning Tool.

==========

Person filling out this form:

Name: Su-Hun YUN
E-mail: s-yun@bl.jp.nec.com
Tel.: +81 44 396 3247
Title: Assistant Manager
Company: NEC Corporation
Date prepared: Sep. 20, 2002

2.17. NetPlane Systems

GMPLS Signaling Implementation Survey Form [V 1.0]

1. Organization: NetPlane Systems, a division of Conexant Systems

1.1 Organization url(s): www.netplane.com

2. Product title(s):
LTCS (Label Traffic Control System)- Optical and Classical, LTCS-LMP

2.1 Brief description(s):

3. Portable software protocol products which support multiple ietf drafts and RFCs, and implementation agreements coming out of the OIF. MPLS and GMPLS Signaling Products, which includes RSVP, LDP, CR-LDP, OUNI. Also have LMP to support optical network requirements.

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3. Contact for GMPLS information
3.1 Name: Sandra Herforth

3.2 Title: Sr. Product Manager

3.3 E-mail: sherforth@netplane.com

3.4 Organization/department: Marketing

3.5 Postal address: 200 Lowder Brook Drive, Westwood, MA 02090

3.6 Phone: 781-251-5363

3.7 Fax: 781-329-6703

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4. Status:
4.1 [ ] Development
4.2 [ ] Alpha
4.3 [ ] Beta
4.4 [X] Product: All products listed above are released and are generally available.
4.5 [ ] Other (describe):

5. Switching capabilities
5.1 [X] PSC
5.2 [X] TDM
5.3 [X] LSC
5.4 [X] FSC

6. Reference Drafts (please list, include version numbers)

RFC 2205 Resource ReSerVation Protocol (RSVP)
RFC 2206 RSVP Management Information Base using SMIv2
RFC 2208 Resource ReSerVation Protocol (RSVP) Version 1 Applicability Statement
RFC 2209 Resource ReSerVation Protocol (RSVP) Version 1 Message Processing Rules
RFC 2210 The Use of RSVP with IETF Integrated Services
RFC 2547 BGP/MPLS VPNs
RFC 2702 Requirements for Traffic Engineering over MPLS
RFC 2750 RSVP Extensions for Policy Control
RFC 2764 Framework for IP-based Virtual Private Networks
RFC 2961 RSVP Refresh Overhead Reduction Extensions
RFC 2997 Specification of the Null Service Type
RFC 3031 Multiprotocol Label Switching Architecture
RFC 3032 MPLS Label Stack Encoding
RFC 3034 Use of Label Switching on Frame Relay Networks Specification
RFC 3035 MPLS using LDP and ATM VC Switching
RFC 3036 LDP Specification
RFC 3037 LDP Applicability
RFC 3209 RSVP-TE: Extensions to RSVP for LSP Tunnels
RFC 3210 Applicability statement for the extensions to RSVP for LSP Tunnels
RFC 3212 Contraint-Based LSP Setup using LDP
RFC 3213 Applicability Statement for CR-LDP

draft-ietf-ccamp-gmpls-architecture-02 Generalized Multi-Protocol Label Switching (GMPLS) Architecture

draft-ietf-mpls-generalized-signaling-04 Generalized MPLS-Signaling Functional Description

draft-ietf-mpls-generalized-rsvp-te-02 Generalized MPLS Signaling - RSVP-TE Extensions

draft-ietf-ccamp-gmpls-architecture-02 Generalized Multi-Protocol Label Switching (GMPLS) Architecture

draft-many-ccamp-gmpls-framework-00 A Framework for Generalized Multi-protocol Label Switching (GMPLS)
draft-ietf-mpls-rsvp-unnum-04 Signalling Unnumbered Links in RSVP-TE
draft-ietf-mpls-lsp-hierarchy-03 LSP Hierarchy with MPLS TE
draft-ietf-mpls-bundle-01 Link Bundling in MPLS Traffic Engineering
draft-ietf-ccamp-gmpls-sonet-sdh-02 GMPLS Extensions for SONET and SDH Control
draft-oetf-ccamp-gmpls-sonet-sdh-extensions GMPLS Extensions to Control Non-Standard SONET and SDH Features
draft-ietf-mpls-diff-ext-09 MPLS Support of Differentiated Services
draft-ietf-mpls-lsr-mib-07 Multiprotocol Label Switching (MPLS) LSR Management Information Base
draft-ietf-mpls-mpls-te-mib-06 Multiprotocol Label Switching (MPLS) Traffic Engineering Management Information Base
draft-ietf-mpls-ldp-mib-08 Definitions of Managed Objects for the Multiprotocol Label Switching, Label Distribution Protocol (LDP)
draft-ietf-mpls-ftn-mib-03 Multiprotocol Label Switching (MPLS) FEC-To-NHLFE (FTN) Management Information Base
draft-ietf-mpls-rsvp-lsp-tunnel-09 RSVP-TE: Extensions to RSVP for LSP Tunnels
draft-ietf-mpls-rsvp-tunnel-applicability-02 Applicability Statement for Extensions to RSVP for LSP-Tunnels
draft-ietf-mpls-cr-ldp-06 Constraint-Based LSP Setup using LDP
draft-ietf-mpls-crisp-modify-03 LSP Modification Using CR-LDP
draft-ietf-mpls-ldp-state-04 LDP State Machine
draft-ietf-mpls-tc-mib-02 Definition of Textual Conventions and OBJECT-IDENTITIES for Multi-Protocol Label Switching (MPLS) Management
draft-martini-l2circuit-trans-mpls-08 Transport of Layer 2 Frames Over MPLS
draft-martini-l2-encap-mpls-04 Encapsulation Methods for Transport of Layer 2 Frames Over IP and MPLS Networks
draft-ietf-ppvpn-rfc2547bis-01 BGP/MPLS VPNs
draft-ietf-mpls-mgmt-overview Multiprotocol Label Switching (MPLS) Management Overview
draft-ietf-ipo-ason-02 Automatic Switched Optical Network (ASON) Architecture and Its Related Protocols
draft-ietf-ccamp-lmp-02 Link Management Protocol (LMP)
draft-fredette-lmp-wdm-03 Link Management Protocol (LMP) for DWDM Optical Line Systems
draft-ietf-ccamp-lmp-mib-00 Link Management Protocol Management Information Base Using SMIv2

7. Interface technologies
7.1 [X] Frame Relay
7.2 [X] ATM
7.3 [X] Ethernet V2/DIX
7.4 [X] Ethernet 802.3
7.5 [X] SDH
7.6 [X] SONET

7.7 [X] Lambda (photonic)
7.8 [X] Fiber
7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability
8.1 [ ] Public and free
8.2 [ ] Only to selected organizations/companies but free
8.3 [X] On sale.
8.4 [ ] For internal company use only
8.5 [ ] Other:

9. Implementation based on: (check all that apply)
9.1 [ ] Purchased code (please list source if possible)
9.2 [ ] Free code (please list source if possible)

9.3 [X] Internal implementation (no outside code, just from specs)
9.4 [ ] Internal implementation on top of purchased or free code
9.4.1 [ ] List portions from external source
9.4.2 [X] List portions developed internally

All of NetPlane Systems' Implementations are based completely on internally developed code. NetPlane owns all intellectual property relating to its products and provides full indemnification against 3rd party claims for possible future royalties, etc.

10. Supported Label Types
10.1 [X] MPLS Label
10.2 [X] Generalized Label
10.3 [X] Waveband Label
10.4 [X] SONET/SDH Label

11. Label Related
11.1 [X] Suggested Label
11.2 [X] Label Set

12. Traffic Parameters
12.1 [X] Intserv (Controlled load, Guaranteed Service, and Null Service Type)
12.2 [X] CR-LDP
12.3 [X] GMPLS Bandwidth Encoding
12.4 [X] SONET/SDH

13. [X] Bidirectional LSPs

14. Notification
14.1 [X] Acceptable Label Set
14.2 [X] Notify Request Objects (GMPLS-RSVP)
14.3 [X] Notify Message (GMPLS-RSVP)
14.4 [X] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features
15.1 [X] Explicit Label Control
15.2 [X] Protection Information
15.3 [X] Administrative Status Information
15.4 [X] Interface Identification
15.5 [ ] Errored Interface Identification
15.6 [X] Link Fault Handling
15.7 [X] Nodal Fault Handling
- Supported by Redundant and Distributed Product Packages

16. Other specification(s) which apply:

OIF UNI 1.0 Signaling Implementation Agreement, oif2000.125.7

ITU-T G.8080/Y.1304-Architecture and Specifications for Automatically Switched Optical Network

ITU-T G.7713/Y.1704-Distributed Call and Connection Management

ITU-T G.7712/Y.1703-Architecture and Specification of Data Communication Network

17. Other features supported:

Support of Redundant Architectures to support Nodal and Control Plane Failure
Fault Tolerance (hot backup)
Flexible Software to support multiple types of distributed architectures
Bundled links
Non-associated (out of band) signaling
Graceful deletion
LSP hierarchy
Reverse LSPs
Diffserv
Resource Affinities
Wavelength Conversion Incapable

18. Currently-defined GMPLS signaling features not supported:

Generally support all GMPLS signaling requirements which are adequately defined in the IETF drafts today. There are a few items like Graceful Restart and Persistence which have IETF Drafts or industry solutions which carriers are resistant to deploy in their current networks. NetPlane is taking a measured approach to support more appropriate and effective solutions. Fast Restart Link Bundling MIB is currently supported by an Enterprise MIB which was developed to support an early version of the Link Bundle MIB.

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

NetPlane's LTCS product line supports a unified code base which (optionally) supports MPLS (RSVP-TE, LDP, CR-LDP), GMPLS (RSVP-TE) and OIF O-UNI (RSVP-TE).It has been used a majority of OEMs for a wide range of applications, including core optical network devices, where scalability and high availability is a critical requirement, a variety of optical "edge" devices where architectural flexibility, scalability and performance are key, including support for O-UNI and it has been field deployed in carrier networks for classical MPLS applications.

To fully support GMPLS applications, NetPlane also offers LMP.

Additionally NetPlane offers a full range of routing protocols,

including OSPF and BGP4. The OSPF implementation is complemented by

Traffic Engineering (TE) extensions and a Constrained Shortest Path First (CSPF) engine to calculate explicit paths for both IP and optical applications MPLS/GMPLS.

Provide Software Source code to many types of Network Equipment Providers, NetPlane Systems has over 200 customers worldwide for all of their products.

20. If you feel the above categories are not complete, add others which will better describe your project:

==========

Person filling out this form:

Name:	Sandra Herforth
E-mail:	sherforth@netplane.com
Tel.:	781-251-5363
Title:	Sr. Product Manager
Company:	NetPlane Systems
Date prepared:	April 3, 2002

2.18. Nippon Telegraph and Telephone Corporation

GMPLS Signaling Implementation Survey Form [V 1.1]

1. Organization: Nippon Telegraph and Telephone Corporation

1.1 Organization url(s): http://www.onlab.ntt.co.jp/

2. Product title(s): HIKARI router

2.1 Brief description(s):
NTT's HIKARI router is an integrated GMPLS router with L1/L2/L3 switching capabilities.

---

3. Contact for GMPLS information

3.1 Name: Satoru Okamoto

3.2 Title: Senior Research Engineer

3.3 E-mail: okamoto@exa.onlab.ntt.co.jp

3.4 Organization/department: NTT Network Innovation Laboratories

3.5 Postal address: 9-11 Midori-Cho 3-Chome, Musashino-shi,

Tokyo 180-8585 JAPAN

3.6 Phone: +81 422 59 4353

3.7 Fax: +81 422 59 6387

---

4. Status:
4.1 [X] Development
4.2 [ ] Alpha
4.3 [ ] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities

	[GMPLS-RSVP]	[GMPLS-LDP]	
5.1	[X]	[X]	PSC
5.2	[ ]	[ ]	TDM
5.3	[X]	[X]	LSC
5.4	[ ]	[ ]	FSC

6. Reference Drafts (please list, include version numbers)
6.1 [RFC-3212]
6.2 [draft-ietf-mpls-generalized-rsvp-te-06.txt]
6.3 [draft-ietf-mpls-generalized-signaling-07.txt]
6.4 [draft-ietf-ccamp-ospf-gmpls-extensions-05.txt]
6.5 [ ]
6.6 [ ]

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [X] Ethernet 802.3
7.5 [X] SDH
7.6 [X] SONET
7.7 [X] Lambda (photonic)
7.8 [ ] Fiber
7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability

	[GMPLS-RSVP]	[GMPLS-LDP]	
8.1	[ ]	[ ]	Public and free
8.2	[ ]	[ ]	Only to selected organizations/companies but free
8.3	[ ]	[ ]	On sale.

8.4	[X]	[X]	For internal company use only
8.5	[ ]	[ ]	Other:

9. Implementation based on: (check all that apply)

	[GMPLS-RSVP]	[GMPLS-LDP]	
9.1	[ ]	[ ]	Purchased code (please list source if possible)
9.2	[ ]	[ ]	Free code (please list source if possible)
9.3	[ ]	[ ]	Internal implementation (no outside code, just from specs)
9.4	[X]	[X]	Internal implementation on top of purchased or free code
9.4.1			List portions from external source: (Identify protocol if appropriate)
9.4.2			List portions developed internally: (Identify protocol if appropriate)

10. Supported Label Types

	[GMPLS-RSVP]	[GMPLS-LDP]	
10.1	[X]	[X]	MPLS Label
10.2	[X]	[ ]	Generalized Label
10.3	[X]	[X]	Waveband Label
10.4	[ ]	[ ]	SONET/SDH Label

11. Label Related

	[GMPLS-RSVP]	[GMPLS-LDP]	
11.1	[X]	[ ]	Suggested Label
11.2	[X]	[ ]	Label Set

12. Traffic Parameters

	[GMPLS-RSVP]	[GMPLS-LDP]	
12.1	[ ]		Intserv (Please list which)
12.2		[X]	CR-LDP
12.3	[X]	[ ]	GMPLS Bandwidth Encoding
12.4	[ ]	[ ]	SONET/SDH

13. Bidirectional LSPs

[GMPLS-RSVP]	[GMPLS-LDP]	
[X]	[X]	Bidirectional LSPs

14. Notification

[GMPLS-	[GMPLS-

	[GMPLS-RSVP]	[GMPLS-LDP]	
14.1	[ ]	[ ]	Acceptable Label Set
14.2	[ ]		Notify Request Objects (GMPLS-RSVP)
14.3	[X]		Notify Message (GMPLS-RSVP)
14.4	[X]		Removing State with a PathErr message (GMPLS-RSVP)

15 Other features

	[GMPLS-RSVP]	[GMPLS-LDP]	
15.1	[X]	[ ]	Explicit Label Control
15.2	[X]	[ ]	Protection Information
15.3	[X]	[ ]	Administrative Status Information
15.4	[X]	[ ]	Interface Identification
15.5	[X]	[ ]	Errored Interface Identification
15.6	[ ]	[ ]	Link Fault Handling
15.7	[ ]	[ ]	Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:
17.1 related to [GMPLS-RSVP]
17.2 related to [GMPLS-LDP]
17.3 Other

18. Currently-defined GMPLS signaling features not supported:
18.1 related to [GMPLS-RSVP]
18.2 related to [GMPLS-LDP]
18.3 related to [GMPLS-SONET]
18.4 Other

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which will better describe your project:

==========

Person filling out this form:

Name: Satoru Okamoto
E-mail: okamoto@exa.onlab.ntt.co.jp
Tel.: +81 422 59 4353
Title: Senior Research Engineer
Company: Nippon Telegraph and Telephone Corporation
Date prepared: 05/31/2002

2.19. Nortel Networks

GMPLS Signaling Implementation Survey Form [V 1.0]

1. Organization: Nortel Networks

1.1 Organization url(s): www.nortelnetworks.com

2. Product title(s): Automatic Switched Optical Networks (ASON)

2.1 Brief description(s): optical control plane

---

3. Contact for GMPLS information

3.1 Name: Don Fedyk

3.2 Title:Senior Advisor

3.3 E-mail: dwfedyk@nortelnetworks.com

3.4 Organization/department:

3.5 Postal address: 600 Technology Park, Billerica, MA 01450

3.6 Phone:978 288 3041

3.7 Fax:

---

4. Status:
4.1 [ ] Development
4.2 [ ] Alpha
4.3 [ ] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities
5.1 [ ] PSC
5.2 [ ] TDM
5.3 [ ] LSC
5.4 [ ] FSC

6. Reference Drafts (please list, include version numbers)
6.1 [x] draft-ietf-mpls-generalized-signaling-07.txt
6.2 [x] draft-ietf-mpls-generalized-cr-ldp-05.txt

6.3 [ ]
6.4 [ ]
6.5 [ ]
6.6 [ ]

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [ ] Ethernet 802.3
7.5 [ ] SDH
7.6 [ ] SONET
7.7 [ ] Lambda (photonic)
7.8 [ ] Fiber
7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability
8.1 [ ] Public and free
8.2 [ ] Only to selected organizations/companies but free
8.3 [ ] On sale.
8.4 [ ] For internal company use only
8.5 [ ] Other:

9. Implementation based on: (check all that apply)
9.1 [ ] Purchased code (please list source if possible)
9.2 [ ] Free code (please list source if possible)
9.3 [ ] Internal implementation (no outside code, just from specs)
9.4 [ ] Internal implementation on top of purchased or free code
9.4.1 [ ] List portions from external source
9.4.2 [ ] List portions developed internally

10. Supported Label Types
10.1 [x] MPLS Label
10.2 [x] Generalized Label
10.3 [x] Waveband Label
10.4 [x] SONET/SDH Label

11. Label Related
11.1 [x] Suggested Label
11.2 [x] Label Set

12. Traffic Parameters
12.1 [ ] Intserv (Please list which)
12.2 [x] CR-LDP
12.3 [x] GMPLS Bandwidth Encoding
12.4 [x] SONET/SDH

13. [x] Bidirectional LSPs

14. Notification
14.1 [x] Acceptable Label Set
14.2 [ ] Notify Request Objects (GMPLS-RSVP)
14.3 [ ] Notify Message (GMPLS-RSVP)
14.4 [ ] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features
15.1 [ ] Explicit Label Control
15.2 [ ] Protection Information
15.3 [ ] Administrative Status Information
15.4 [ ] Interface Identification
15.5 [ ] Errored Interface Identification
15.6 [ ] Link Fault Handling
15.7 [ ] Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:

18. Currently-defined GMPLS signaling features not supported:

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which will better describe your project:

==========

Person filling out this form:

Name:Don Fedyk
E-mail:see above
Tel.:
Title:
Company:
Date prepared:

2.20. Polaris Networks Inc

GMPLS Signaling Implementation Survey Form [V 1.1]

1. Organization: Polaris Networks Inc.

1.1 Organization url(s): www.polarisnetworks.com

2. Product title(s): OMX

2.1 Brief description(s):

The OMX is a Terabit-scalable optical transport
switch that combines the functions of SONET ADM
with a Wideband, Broadband and Super-broadband
Digital Cross-connect System (DCS) in a single
consolidated footprint. The control plane on the
OMX is IP and GMPLS based to support the end-to-end
provisioning of services.

---

3. Contact for GMPLS information
3.1 Name: Dean Cheng

3.2 Title: Principal Network Architect

3.3 E-mail: dcheng@polarisnetworks.com

3.4 Organization/department: Architecture

3.5 Postal address:

6810 Santa Teresa Bl., San Jose CA 95119

3.6 Phone: (408) 284-8061

3.7 Fax: (408) 281-7463

---

4. Status:
4.1 [x] Development
4.2 [ ] Alpha
4.3 [ ] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities

	[GMPLS-RSVP]	[GMPLS-LDP]	
5.1	[ ]	[ ]	PSC
5.2	[x]	[ ]	TDM
5.3	[ ]	[ ]	LSC
5.4	[ ]	[ ]	FSC

6. Reference Drafts (please list, include version numbers)
6.1 [x] RFC 2328 OSPF v2
6.2 [x] RFC 2370 OSPF Opaque LSA
6.3 [x] draft-katz-yeung-ospf-traffic-06.txt
6.4 [x] draft-ietf-ccamp-gmpls-routing-04.txt
6.5 [x] draft-ietf-ccamp-gmpls-ospf-gmpls-extensions-07.txt
6.6 [x] RFC 2205 RSVP
6.7 [x] RFC 3209 Traffic Engineering Extensions to RSVP
6.8 [x] draft-ietf-mpls-generalized-signaling-07.txt
6.9 [x] draft-ietf-mpls-generalized-rsvp-te-06.txt
6.10 [x] draft-ietf-ccamp-gmpls-sonet-sdh-05.txt
6.11 [x] draft-ietf-mpls-rsvp-unnum-06.txt
6.12 [x] draft-ietf-mpls-bundle-03.txt
6.13 [x] draft-ietf-ccamp-lmp-02.txt
6.14 [x] RFC 2784 GRE
6.14 [x] RFC 1661 PPP in HDLC-like Framing
6.15 [x] RFC 1662 PPP
6.16 [x] RFC 1332 IPCP

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [x] Ethernet V2/DIX
7.4 [x] Ethernet 802.3
7.5 [ ] SDH
7.6 [x] SONET
7.7 [ ] Lambda (photonic)
7.8 [ ] Fiber
7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability

	[GMPLS-RSVP]	[GMPLS-LDP]	
8.1	[ ]	[ ]	Public and free
8.2	[ ]	[ ]	Only to selected organizations/companies but free
8.3	[ ]	[ ]	On sale.
8.4	[x]	[ ]	For internal company use only
8.5	[ ]	[ ]	Other:

9. Implementation based on: (check all that apply)

	[GMPLS-RSVP]	[GMPLS-LDP]	
9.1	[ ]	[ ]	Purchased code (please list source if possible)
9.2	[ ]	[ ]	Free code (please list source if possible)
9.3	[ ]	[ ]	Internal implementation (no outside code, just from specs)
9.4	[x]	[ ]	Internal implementation on top of purchased or free code
9.4.1			List portions from external source: (Identify protocol if appropriate)
9.4.2			List portions developed internally: (Identify protocol if appropriate)

10. Supported Label Types

	[GMPLS-RSVP]	[GMPLS-LDP]	
10.1	[ ]	[ ]	MPLS Label
10.2	[ ]	[ ]	Generalized Label
10.3	[ ]	[ ]	Waveband Label
10.4	[x]	[ ]	SONET/SDH Label

11. Label Related

	[GMPLS-RSVP]	[GMPLS-LDP]	
11.1	[x]	[ ]	Suggested Label
11.2	[ ]	[ ]	Label Set

12. Traffic Parameters

	[GMPLS-RSVP]	[GMPLS-LDP]	
12.1	[ ]		Intserv (Please list which)
12.2		[ ]	CR-LDP
12.3	[x]	[ ]	GMPLS Bandwidth Encoding
12.4	[x]	[ ]	SONET/SDH

13. Bidirectional LSPs

	[GMPLS-RSVP]	[GMPLS-LDP]	
	[x]	[ ]	Bidirectional LSPs

14. Notification

	[GMPLS-RSVP]	[GMPLS-LDP]	
14.1	[ ]	[ ]	Acceptable Label Set
14.2	[x]		Notify Request Objects (GMPLS-RSVP)
14.3	[x]		Notify Message (GMPLS-RSVP)

14.4 [x] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features

	[GMPLS-RSVP]	[GMPLS-LDP]	
15.1	[x]	[ ]	Explicit Label Control
15.2	[x]	[ ]	Protection Information
15.3	[x]	[ ]	Administrative Status Information
15.4	[x]	[ ]	Interface Identification
15.5	[x]	[ ]	Errored Interface Identification
15.6	[x]	[ ]	Link Fault Handling
15.7	[x]	[ ]	Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:
17.1 related to [GMPLS-RSVP]
17.2 related to [GMPLS-LDP]
17.3 Other

18. Currently-defined GMPLS signaling features not supported:
18.1 related to [GMPLS-RSVP]
18.2 related to [GMPLS-LDP]
18.3 related to [GMPLS-SONET]
18.4 Other

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which will better describe your project:

==========

Person filling out this form:

Name: Same as above.
E-mail:
Tel.:
Title:
Company:
Date prepared: 9/16/2002

2.21. Sycamore Networks Inc.

GMPLS Signaling Implementation Survey Form [V 1.1]

1. Organization: Sycamore Networks Inc.

1.1 Organization url(s): www.sycamorenetworks.com

2. Product title(s): SN 3000 optical switch, SN 16000 optical switch

2.1 Brief description(s):

Metro and core optical switches with STS-1 level granularity, integrated routing, signaling and management software. GMPLS is implemented using the IETF CCAMP Working Group Internet Drafts in order to support standards-based compatibility and provide the foundation for multi-vendor interoperability. Validated multiple GMPLS interoperability configurations (peer, overlay, hybrid) during the MPLS Forum-sponsored GMPLS testing activity conducted at University of New Hampshire InterOperability Lab, September 30 - October 4, 2002. Testing included signaling (RSVP-TE) and control plane interoperability with multiple (edge LSR) devices from vendors including Cisco, Juniper, Agilent, Data Connection Ltd., NetTest, and NetPlane.

---

3. Contact for GMPLS information
3.1 Name: Tom DiMicelli

3.2 Title: Senior Product Manager

3.3 E-mail: tdimicelli@sycamorenet.com

3.4 Organization/department: Product Management/Network Switching

3.5 Postal address: 220 Mill Road, Chelmsford, MA

3.6 Phone: 978-367-7978

3.7 Fax: 978-250-9207

---

4. Status:
4.1 [ ] Development
4.2 [] Alpha
4.3 [X] Beta
4.4 [ ] Product

4.5 [ ] Other (describe):

5. Switching capabilities

	[GMPLS- RSVP]	[GMPLS-LDP]	
5.1	[ ]	[ ]	PSC
5.2	[X]	[ ]	TDM
5.3	[X]	[ ]	LSC
5.4	[X]	[ ]	FSC

6. Reference Drafts (please list, include version numbers)

6.1 [X] draft-ietf-mpls-generalized-signaling-07.txt
6.2 [X] draft-ietf-mpls-generalized-rsvp-te-06.txt
6.3 [X] draft-ietf-ccamp-gmpls-sonet-sdh-02.txt
6.4 [X] draft-iwata-mpls-crankback-00.txt
6.5 [X] draft-pan-mpls-restart-01.txt

Drafts implemented as part of the October 2002 UNH and NGN GMPLS interoperability testing and demonstration:

. draft-ietf-mpls-generalized-signaling-08.txt
. draft-ietf-mpls-generalized-rsvp-te-07.txt

7. Interface technologies

7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [ ] Ethernet 802.3
7.5 [X] SDH
7.6 [X] SONET
7.7 [ ] Lambda (photonic)
7.8 [ ] Fiber
7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability

	[GMPLS-RSVP]	[GMPLS- LDP]	
8.1	[ ]	[ ]	Public and free
8.2	[X]	[ ]	Only to selected organizations/companies but free
8.3	[ ]	[ ]	On sale.
8.4	[ ]	[ ]	For internal company use only
8.5	[ ]	[ ]	Other:

9. Implementation based on: (check all that apply)

	[GMPLS-RSVP]	[GMPLS-LDP]	
9.1	[ ]	[ ]	Purchased code (please list source if possible)
9.2	[ ]	[ ]	Free code (please list source if possible)
9.3	[ ]	[ ]	Internal implementation (no outside code, just from specs)

9.4 [X] [ ] Internal implementation on top of purchased or free code

9.4.1 List portions from external source: (Identify protocol if appropriate)
9.4.2 List portions developed internally: (Identify protocol if appropriate)

10. Supported Label Types

	[GMPLS-RSVP]	[GMPLS-LDP]	
10.1	[ ]	[ ]	MPLS Label
10.2	[X]	[ ]	Generalized Label
10.3	[ ]	[ ]	Waveband Label
10.4	[X]	[ ]	SONET/SDH Label

11. Label Related

	[GMPLS-RSVP]	[GMPLS-LDP]	
11.1	[X]	[ ]	Suggested Label
11.2	[X]	[ ]	Label Set

12. Traffic Parameters

	[GMPLS-RSVP]	[GMPLS-LDP]	
12.1	[X]		Intserv (Please list which)
12.2		[ ]	CR-LDP
12.3	[ ]	[ ]	GMPLS Bandwidth Encoding
12.4	[X]	[ ]	SONET/SDH

13. Bidirectional LSPs

[GMPLS-RSVP]	[GMPLS-LDP]	
[X]	[ ]	Bidirectional LSPs

14. Notification

	[GMPLS-RSVP]	[GMPLS-LDP]	
14.1	[ ]	[ ]	Acceptable Label Set
14.2	[X]		Notify Request Objects (GMPLS-RSVP)
14.3	[X]		Notify Message (GMPLS-RSVP)
14.4	[X]		Removing State with a PathErr message (GMPLS-RSVP)

15 Other features

	[GMPLS-RSVP]	[GMPLS-LDP]	
15.1	[X]	[ ]	Explicit Label Control
15.2	[ ]	[ ]	Protection Information
15.3	[X]	[ ]	Administrative Status Information
15.4	[X]	[ ]	Interface Identification
15.5	[X]	[ ]	Errored Interface Identification
15.6	[X]	[ ]	Link Fault Handling
15.7	[ ]	[ ]	Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:
17.1 related to [GMPLS-RSVP]
17.2 related to [GMPLS-LDP]

17.3 Other

18. Currently-defined GMPLS signaling features not supported:
18.1 related to [GMPLS-RSVP]
18.2 related to [GMPLS-LDP]
18.3 related to [GMPLS-SONET]
18.4 Other

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which will better describe your project:

Sycamore is actively engaged in the investigation and development of a variety of additional GMPLS protocols, including OSPF-TE, LMP; as well as strategies for implementing protection and restoration mechanisms.

Parallel to our interoperability activities with GMPLS, Sycamore continues to actively participate in and monitor standards development activities within the OIF and ITU-T.

2.22. Tellium, Inc.

GMPLS Signaling Implementation Survey Form [V 1.0]

1. Organization: Tellium, Inc.

1.1 Organization url(s): www.tellium.com

2. Product title(s): Aurora Optical Switch, Aurora 128

2.1 Brief description(s):

Wavelength optical switch, managing wavelengths which are today at -48 and -192 levels of granularity

---

3. Contact for GMPLS information
3.1 Name: Dimitrios Pendarakis

3.2 Title: Manager, Internetworking and Applications

3.3 E-mail: dpendarakis@tellium.com

3.4 Organization/department: Tellium, Inc.

3.5 Postal address: 2 Crescent Place, P.O. Box 901,
Oceanport, NJ 07757-0901

3.6 Phone: 732 923-4254

3.7 Fax: 732 728-9862

---

4. Status:
4.1 [ ] Development
4.2 [X] Alpha
4.3 [ ] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities
5.1 [ ] PSC
5.2 [X] TDM
5.3 [X] LSC
5.4 [X] FSC

6. Reference Drafts (please list, include version numbers)
6.1 [X] draft-ietf-mpls-generalized-signaling-07.txt
6.2 [X] draft-ietf-mpls-generalized-rsvp-te-06.txt
6.3 [X] draft-ietf-ccamp-gmpls-sonet-sdh-03.txt
6.4 [X] draft-ietf-mpls-rsvp-unnum-04.txt
6.5 [X] draft-ietf-mpls-bundle-01.txt
6.6 [ ]

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [ ] Ethernet 802.3
7.5 [X] SDH
7.6 [X] SONET
7.7 [X] Lambda (photonic)
7.8 [X] Fiber
7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability
8.1 [ ] Public and free
8.2 [ ] Only to selected organizations/companies but free
8.3 [ ] On sale.
8.4 [X] For internal company use only
8.5 [ ] Other:

9. Implementation based on: (check all that apply)
9.1 [ ] Purchased code (please list source if possible)
9.2 [ ] Free code (please list source if possible)

9.3 [ ] Internal implementation (no outside code, just from specs)
9.4 [X] Internal implementation on top of purchased or free code
9.4.1 [ ] List portions from external source
9.4.2 [ ] List portions developed internally

10. Supported Label Types
10.1 [ ] MPLS Label
10.2 [X] Generalized Label
10.3 [ ] Waveband Label
10.4 [X] SONET/SDH Label

11. Label Related
11.1 [X] Suggested Label
11.2 [X] Label Set

12. Traffic Parameters
12.1 [ ] Intserv (Please list which)
12.2 [ ] CR-LDP
12.3 [X] GMPLS Bandwidth Encoding
12.4 [X] SONET/SDH

13. [X] Bidirectional LSPs

14. Notification
14.1 [ ] Acceptable Label Set
14.2 [X] Notify Request Objects (GMPLS-RSVP)
14.3 [X] Notify Message (GMPLS-RSVP)
14.4 [X] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features
15.1 [X] Explicit Label Control
15.2 [X] Protection Information
15.3 [X] Administrative Status Information
15.4 [X] Interface Identification
15.5 [X] Errored Interface Identification
15.6 [ ] Link Fault Handling
15.7 [ ] Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:

18. Currently-defined GMPLS signaling features not supported:

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which

will better describe your project:

==========

Person filling out this form: Same as above
Name:
E-mail:
Tel.:
Title:
Company:
Date prepared: March 12, 2002

2.23. Tropic Networks Inc

GMPLS Signaling Implementation Survey Form [V 1.0]

1. Organization: Tropic Networks Inc

1.1 Organization url(s): http://www.tropicnetworks.com

2.1 Brief description(s):

The product is a switching device in the area of
Optical Packet Networking

---

3. Contact for GMPLS information

3.1 Name: Nabil Seddigh
3.3 E-mail: nseddigh@tropicnetworks.com
3.5 Postal address: 135 Michael Cowpland Dr
Kanata, ON K2M 2E9
3.6 Phone: 613-270-6936

---

4. Status:
4.1 [X] Development
4.2 [ ] Alpha
4.3 [ ] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities
5.1 [X] PSC
5.2 [ ] TDM

5.3 [X] LSC
5.4 [X] FSC

6. Reference Drafts (please list, include version numbers)
6.1 [ ] draft-ietf-mpls-generalized-signaling-07.txt
6.2 [ ] draft-ietf-mpls-generalized-rsvp-te-06.txt
6.3 [ ] draft-ietf-mpls-rsvp-unnum-04.txt
6.4 [ ] draft-ietf-mpls-lsp-hierarchy-04.txt
6.5 [ ] draft-ietf-mpls-bundle-01.txt
6.6 [ ] RFC 3032

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [X] Ethernet 802.3
7.5 [ ] SDH
7.6 [ ] SONET
7.7 [X] Lambda (photonic)
7.8 [X] Fiber
7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability
8.1 [ ] Public and free
8.2 [ ] Only to selected organizations/companies but free
8.3 [ ] On sale.
8.4 [X] For internal company use only
8.5 [ ] Other:

9. Implementation based on: (check all that apply)
9.1 [ ] Purchased code (please list source if possible)
9.2 [ ] Free code (please list source if possible)
9.3 [ ] Internal implementation (no outside code, just from specs)
9.4 [X] Internal implementation on top of purchased or free code
9.4.1 [ ] List portions from external source
9.4.2 [ ] List portions developed internally

10. Supported Label Types
10.1 [X] MPLS Label
10.2 [X] Generalized Label
10.3 [X] Waveband Label
10.4 [ ] SONET/SDH Label

11. Label Related
11.1 [X] Suggested Label
11.2 [ ] Label Set

12. Traffic Parameters
12.1 [X] Intserv (Please list which)
12.2 [ ] CR-LDP
12.3 [X] GMPLS Bandwidth Encoding
12.4 [ ] SONET/SDH

13. [X] Bidirectional LSPs

14. Notification
14.1 [ ] Acceptable Label Set
14.2 [ ] Notify Request Objects (GMPLS-RSVP)
14.3 [ ] Notify Message (GMPLS-RSVP)
14.4 [X] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features
15.1 [ ] Explicit Label Control
15.2 [ ] Protection Information
15.3 [ ] Administrative Status Information
15.4 [X] Interface Identification
15.5 [X] Errored Interface Identification
15.6 [X] Link Fault Handling
15.7 [X] Nodal Fault Handling

==========

Person filling out this form:

Name:	Nabil Seddigh
E-mail:	nseddigh@tropicnetworks.com
Tel.:	613-270-6936
Company:	Tropic Networks
Date prepared:	March 13, 2002

2.24. Wipro Technologies

GMPLS Signaling Implementation Survey Form [V 1.1]

1. Organization: Wipro Technologies

1.1 Organization url(s): www.wipro.com

2. Product title(s): Wipro MPLS stacks

2.1 Brief description(s):

WIP-MPLS product line offers GMPLS/MPLS control plane stacks:

GMPLS extension to CRLDP, GMPLS extension to RSVP-TE, LDP, CRLDP,
RSVP-TE and other related stacks.
---

3. Contact for GMPLS information

3.1 Name: Rana Pratap Sircar

3.2 Title: Architect

3.3 E-mail: rana.sircar@wipro.com

3.4 Organization/department: Wipro Technologies/Telecom and
Internetworking Solutions

3.5 Postal address: Wipro Technologies
No. 26, Hosur Main Road, Bomannahalli,
Bangalore - 560068

3.6 Phone: +91-80-5732296/3 ext 1040

3.7 Fax: +91-80-5732696 / 5732441
---

4. Status:

4.1 [X] Development
4.2 [ ] Alpha
4.3 [ ] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities

	[GMPLS-RSVP]	[GMPLS-LDP]	
5.1	[X]	[X]	PSC
5.2	[X]	[X]	TDM
5.3	[ ]	[ ]	LSC
5.4	[ ]	[ ]	FSC

6. Reference Drafts (please list, include version numbers)

6.1 [draft-ietf-mpls-generalized-cr-ldp-05.txt]
6.2 [draft-ietf-mpls-generalized-signaling-07.txt]
6.3 [draft-ietf-ccamp-gmpls-architecture-02.txt]
6.4 [draft-ietf-mpls-generalized-rsvp-te-06.txt]
6.5 [RFC 2205 : RSVP]
6.6 [RFC 3209 : RSVP-TE]
6.7 [RFC 3212 : CR-LDP]
6.8 [RFC 3214 : LSP Modification Using CR-LDP]

7. Interface technologies
7.1 [X] Frame Relay
7.2 [X] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [X] Ethernet 802.3
7.5 [X] SDH
7.6 [X] SONET
7.7 [ ] Lambda (photonic)
7.8 [ ] Fiber
7.9 [ ] FiberChannel
7.10 [ ] Other (describe):

8. Availability

	[GMPLS-RSVP]	[GMPLS-LDP]	
8.1	[ ]	[ ]	Public and free
8.2	[ ]	[ ]	Only to selected organizations/companies but free
8.3	[X]	[X]	On sale.
8.4	[ ]	[ ]	For internal company use only
8.5	[ ]	[ ]	Other:

9. Implementation based on: (check all that apply)

	[GMPLS-RSVP]	[GMPLS-LDP]	
9.1	[ ]	[ ]	Purchased code (please list source if possible)
9.2	[ ]	[ ]	Free code (please list source if possible)
9.3	[X]	[X]	Internal implementation (no outside code, just from specs)
9.4	[ ]	[ ]	Internal implementation on top of purchased or free code
9.4.1			List portions from external source: (Identify protocol if appropriate)
9.4.2			List portions developed internally: (Identify protocol if appropriate)

10. Supported Label Types

	[GMPLS-RSVP]	[GMPLS-LDP]	
10.1	[X]	[X]	MPLS Label
10.2	[X]	[X]	Generalized Label
10.3	[ ]	[ ]	Waveband Label
10.4	[X]	[X]	SONET/SDH Label

11. Label Related

	[GMPLS-RSVP]	[GMPLS-LDP]

11.1	[X]	[X]	Suggested Label
11.2	[X]	[X]	Label Set

12. Traffic Parameters

	[GMPLS-RSVP]	[GMPLS-LDP]	
12.1	[ ]		Intserv (Please list which)
12.2		[X]	CR-LDP
12.3	[X]	[X]	GMPLS Bandwidth Encoding
12.4	[X]	[X]	SONET/SDH

13. Bidirectional LSPs

	[GMPLS-RSVP]	[GMPLS-LDP]	
	[X]	[X]	Bidirectional LSPs

14. Notification

	[GMPLS-RSVP]	[GMPLS-LDP]	
14.1	[X]	[X]	Acceptable Label Set
14.2	[X]		Notify Request Objects (GMPLS-RSVP)
14.3	[X]		Notify Message (GMPLS-RSVP)
14.4	[X]		Removing State with a PathErr message (GMPLS-RSVP)

15 Other features

	[GMPLS-RSVP]	[GMPLS-LDP]	
15.1	[X]	[X]	Explicit Label Control
15.2	[X]	[X]	Protection Information
15.3	[X]	[X]	Administrative Status Information
15.4	[X]	[X]	Interface Identification
15.5	[X]	[X]	Errored Interface Identification
15.6	[ ]	[ ]	Link Fault Handling
15.7	[ ]	[ ]	Nodal Fault Handling

16. Other specification(s) which apply: Contention Resolution supported

17. Other features supported:

17.1 related to [GMPLS-RSVP] A Node level Admission controller and Resource Manager.

17.2 related to [GMPLS-LDP] A Node level Admission controller and Resource Manager.

17.3 Other

18. Currently-defined GMPLS signaling features not supported:

18.1 related to [GMPLS-RSVP]

18.2 related to [GMPLS-LDP]

18.3 related to [GMPLS-SONET]

18.4 Other

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

Wipro Technologies offers a carrier-class GMPLS/MPLS protocol stacks to OEM vendors. Our product line includes source code architected, developed and tested in a well defined quality framework.

20. If you feel the above categories are not complete, add others which will better describe your project:

==========

Person filling out this form:

Name: Chetan Kumar S
E-mail: chetan.kumar@wipro.com
Tel.: +91 80 5732296
Title: Protocol Specialist
Company: Wipro Technologies
Date prepared: 28-03-02 (dd-mm-yy)

2.25. Anonymous 1

GMPLS Signaling Implementation Survey Form [V 1.0]

4. Status:
4.1 [X] Development
4.2 [ ] Alpha
4.3 [ ] Beta
4.4 [ ] Product
4.5 [ ] Other (describe):

5. Switching capabilities
5.1 [ ] PSC
5.2 [ ] TDM
5.3 [X] LSC
5.4 [ ] FSC

6. Reference Drafts (please list, include version numbers)
6.1 [ ]
6.2 [ ]
6.3 [ ]
6.4 [ ]

6.5 [ ]
6.6 [ ]

7. Interface technologies
7.1 [ ] Frame Relay
7.2 [ ] ATM
7.3 [ ] Ethernet V2/DIX
7.4 [ ] Ethernet 802.3
7.5 [ ] SDH
7.6 [ ] SONET
7.7 [ ] Lambda (photonic)
7.8 [ ] Fiber
7.9 [ ] FiberChannel
7.10 [X] Other (describe): Lambda O-E-O

8. Availability
8.1 [ ] Public and free
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9. Implementation based on: (check all that apply)
9.1 [ ] Purchased code (please list source if possible)
9.2 [ ] Free code (please list source if possible)
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10. Supported Label Types
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11.2 [ ] Label Set

12. Traffic Parameters
12.1 [ ] Intserv (Please list which)
12.2 [ ] CR-LDP
12.3 [X] GMPLS Bandwidth Encoding
12.4 [ ] SONET/SDH

13. [X] Bidirectional LSPs

14. Notification
14.1 [ ] Acceptable Label Set
14.2 [ ] Notify Request Objects (GMPLS-RSVP)
14.3 [X] Notify Message (GMPLS-RSVP)
14.4 [X] Removing State with a PathErr message (GMPLS-RSVP)

15 Other features
15.1 [ ] Explicit Label Control
15.2 [ ] Protection Information
15.3 [ ] Administrative Status Information
15.4 [ ] Interface Identification
15.5 [ ] Errored Interface Identification
15.6 [X] Link Fault Handling
15.7 [X] Nodal Fault Handling

16. Other specification(s) which apply:

17. Other features supported:

18. Currently-defined GMPLS signaling features not supported:

19. Notes (please describe purpose of project, give any information that might be useful to those interested in developing or using GMPLS)

20. If you feel the above categories are not complete, add others which will better describe your project:

3. Acknowledgments

The survey form was derived from V2.2 of the "RSVP and QoS Implementation Survey Information Form" authored by Gene Gaines <ggaines@generation.net> and Marco Festa <festa@cefriel.it>. See http://www.iit.nrc.ca/IETF/RSVP_survey/rsvp-qos_quest_980210.txt.

Scott Bradner, sob@harvard.edu, provided the "anonymous submission" service for this survey.

4. Security Considerations

This document does not address any security issues.

5. IANA Considerations

No parameters are defined in this document.

6. References

[GMPLS-LDP] Ashwood-Smith, P. et al, "Generalized MPLS Signaling - CR-LDP Extensions", Internet Draft, draft-ietf-mpls-generalized-cr-ldp-07.txt, August 2002.

[GMPLS-RSVP] Ashwood-Smith, P. et al, "Generalized MPLS Signaling - RSVP-TE Extensions", Internet Draft, draft-ietf-mpls-generalized-rsvp-te-09.txt, October 2002.

[GMPLS-SIG] Ashwood-Smith, P. et al, "Generalized MPLS - Signaling Functional Description", Internet Draft, draft-ietf-mpls-generalized-signaling-09.txt, August 2002.

[GMPLS-SONET] Ashwood-Smith, P. et al, "GMPLS - SONET / SDH Specifics", Internet Draft, draft-ietf-ccamp-gmpls-sonet-sdh-03.txt, April, 2001.

7. Editors' Addresses

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