

Application Layer Multicast
Extensions for RELOAD
draft-samrg-sam-baseline-protocol-00

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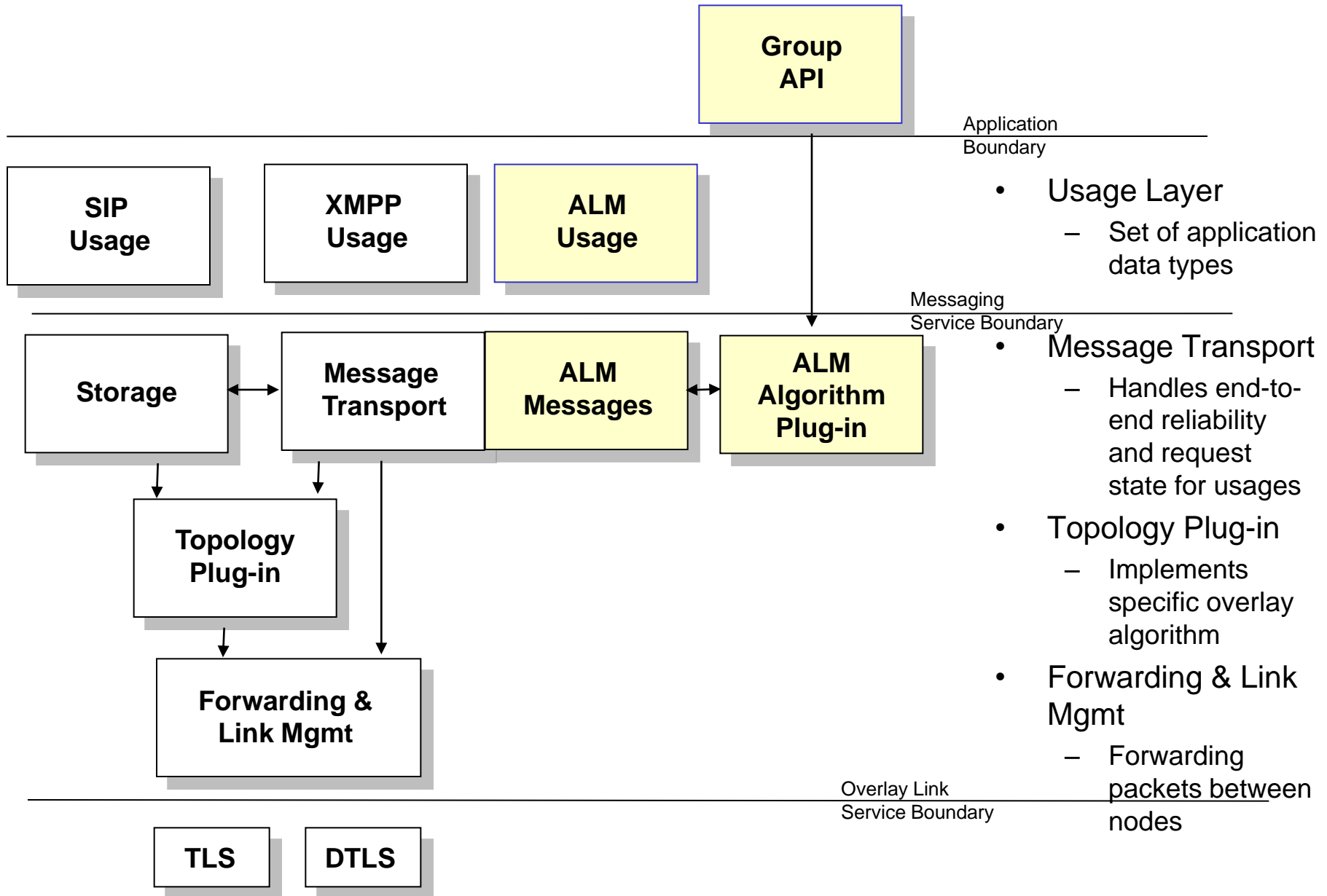
7/28/2011

Changes Since Previous Version

draft-kolberg-sam-baseline-protocol-01

- Remove Hybrid ALM material, will be moved to separate draft
- Define RELOAD architecture extensions
- Define new RELOAD messages
- Define ALM Usage
- Add Scribe as base algorithm for ALM usage.
- Define code points.
- Define preliminary ALM-specific security issues.
- Add CreateTree and Join examples
- Add open issues section

ALM Architecture Extensions for RELOAD



New RELOAD Messages

Message	Code Point
CreateALMTree	x7000
CreateALMTreeResponse	x7001
Join	x7002
JoinAccept	x7003
JoinConfirm	x7004
JoinDecline	x7005
Leave	x7006
LeaveResponse	x7007
Reform	x7008
ReformResponse	x7009
Heartbeat	x700A
Push	x700B
PushResponse	x700C

ALM Usage

- New ALMTree Kind
 - Stored in the DHT at NodeID responsible for GroupID
- **Kind ID:** Resource Name for the ALMTree Kind-ID is the SessionKey used to identify the ALM tree
- **Data Model:**
 - struct {
 - NodeID PeerId; // overlay address of the peer that creates the multicast tree
 - opaque SessionKey<0..2³²-1>; // hash of well-known string
 - NodeID GroupId; // the overlay address of the root of the tree
 - Dictionary Options;
 - } ALMTree;
- **Access Control:** NODE-MATCH
- Options: name-value list of properties to be associated with the tree, such as the maximum size of the tree, restrictions on peers joining the tree, latency constraints, preference for distributed or centralized tree formation and maintenance, heartbeat interval.

Scribe as Base Algorithm

Section in Draft	RELOAD ALM Message	Scribe Message
5.2.1	CreateALMTree	Create
5.2.2	Join	Join
5.2.3	JoinAccept	
5.2.4	JoinConfirm	
5.2.5	JoinDecline	
5.2.8	Leave	Leave
5.2.10	Reform	
5.2.11	Heartbeat	
new	Push/Deliver/Send	Multicast
	Note 1	deliver
	Note 1	forward
	Note 1	route
	Note 1	send

ALM Security Issues

- Overlays are vulnerable to DOS and collusion attacks.
- We are not solving overlay security issues.
- We assume the node authentication model as defined in [I-D.ietf-p2psip-base].
- ALM Usage specific security issues:
 - Right to create GroupID at some NodeID
 - Right to store Tree info at some Location in the DHT
 - Limit on # messages / sec and bandwidth use
 - Right to join an ALM tree

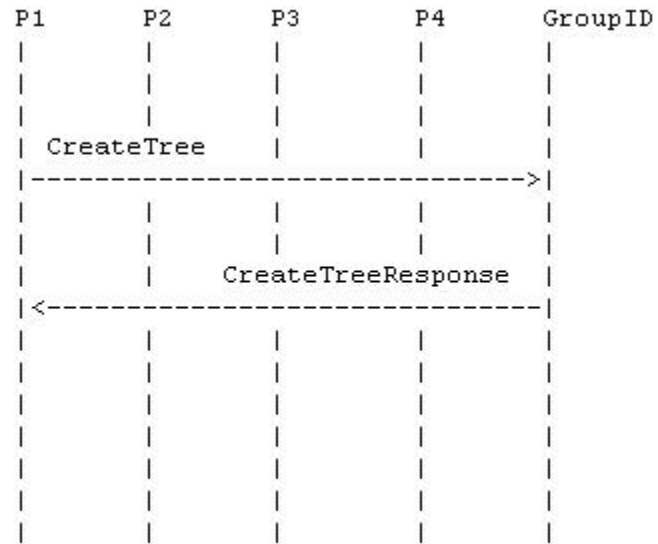
IANA Considerations

- This memo includes no request to IANA.
- Code points for the kinds defined in this document **MUST** not conflict with any defined code points for RELOAD.
- For Data Kind-IDs, the RELOAD specification states: "Code points in the range 0xf0000001 to 0xffffffe are reserved for private use".
 - ALM Usage Kind-IDs will be defined in the private use range.
- Code points for new message types defined in this document must not conflict with any defined code points for RELOAD.
 - Unlike Data Kind- IDs which permit private code points, RELOAD does not define private or experimental code points for Message Codes.
 - For experimental purposes we recommend using message code points in the range 0x7000 to 0x70FF for the new message types defined in this specification.
- All ALM Usage messages support the RELOAD Message Extension mechanism.

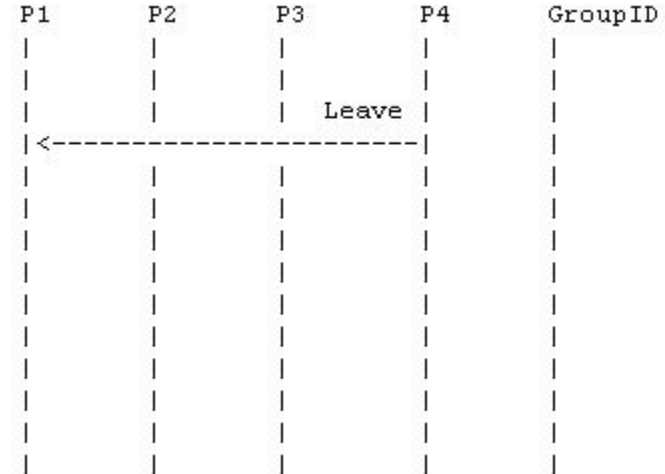
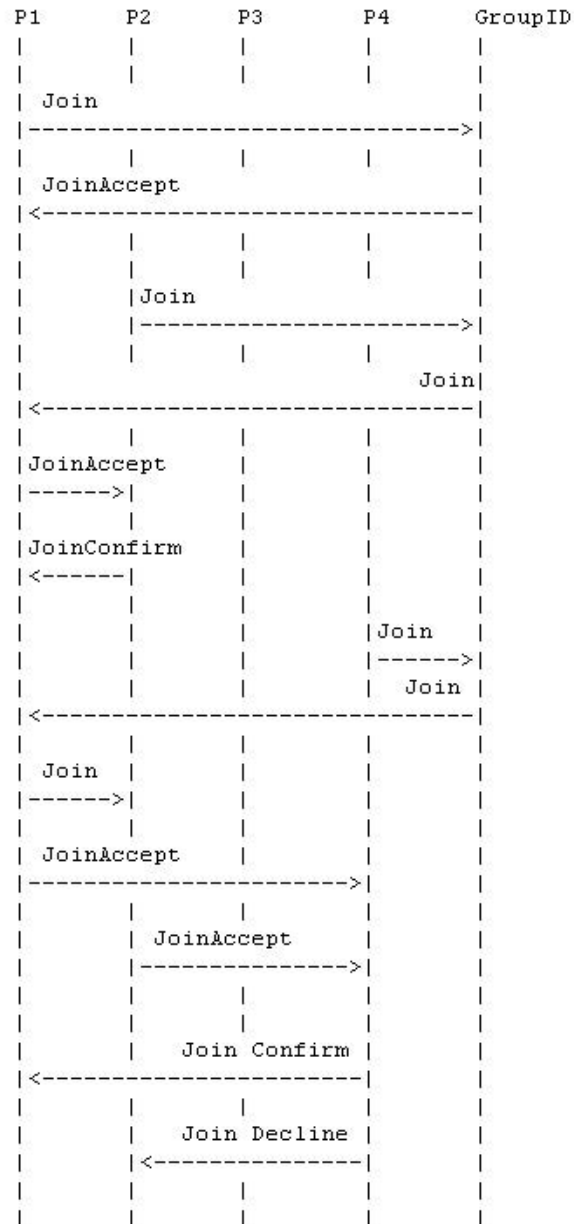
IANA Considerations

- No new Error Codes are defined.
- Application-ID:
 - The ALM Usage Application-IDs must not conflict with other applications of reload.
 - Additionally if AppAttach is used, the port number must be selected to avoid conflicts.
- Access Control Policies: No new policies.
- ALM Algorithm Types: There is currently one type: SCRIBE-RELOAD.

Example: CreateTree



Example: Join

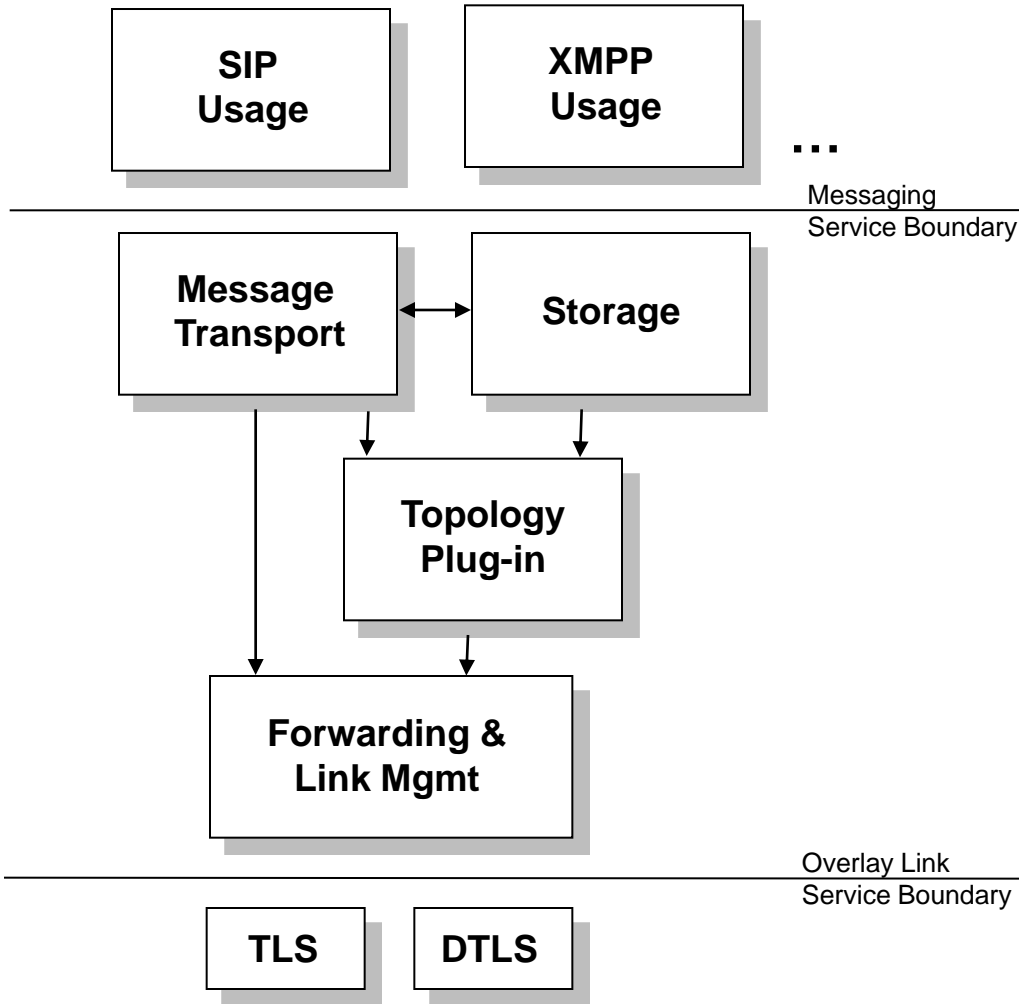


Open Issues

- The specific capabilities of clients in terms of tree creation and being parents of other nodes will be described in subsequent versions.
- ALM parameter definitions for the RELOAD configuration file will be defined in a later version.
- Should any other ALM algorithms be mapped

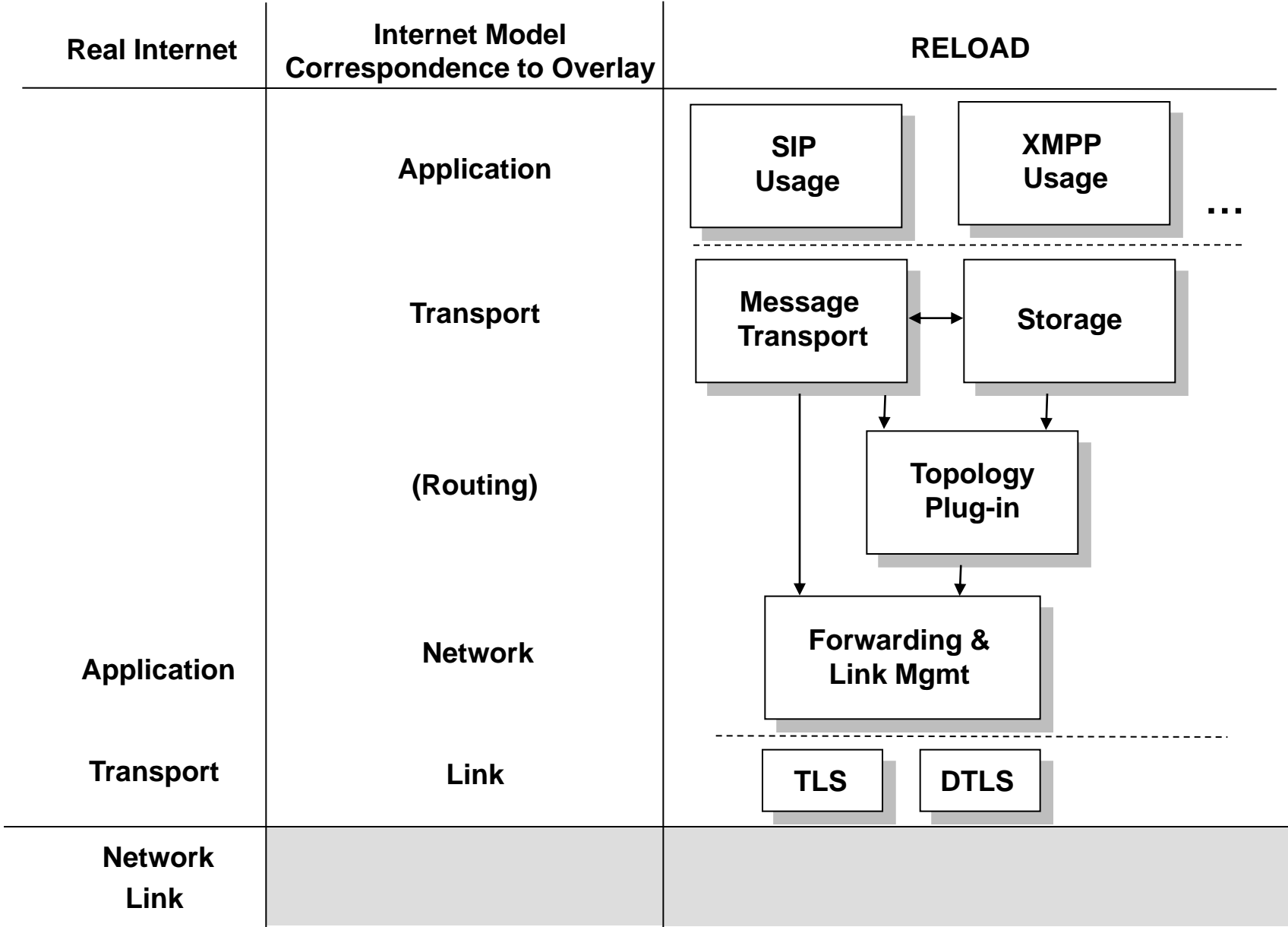
BACKUP

P2P-SIP Architecture

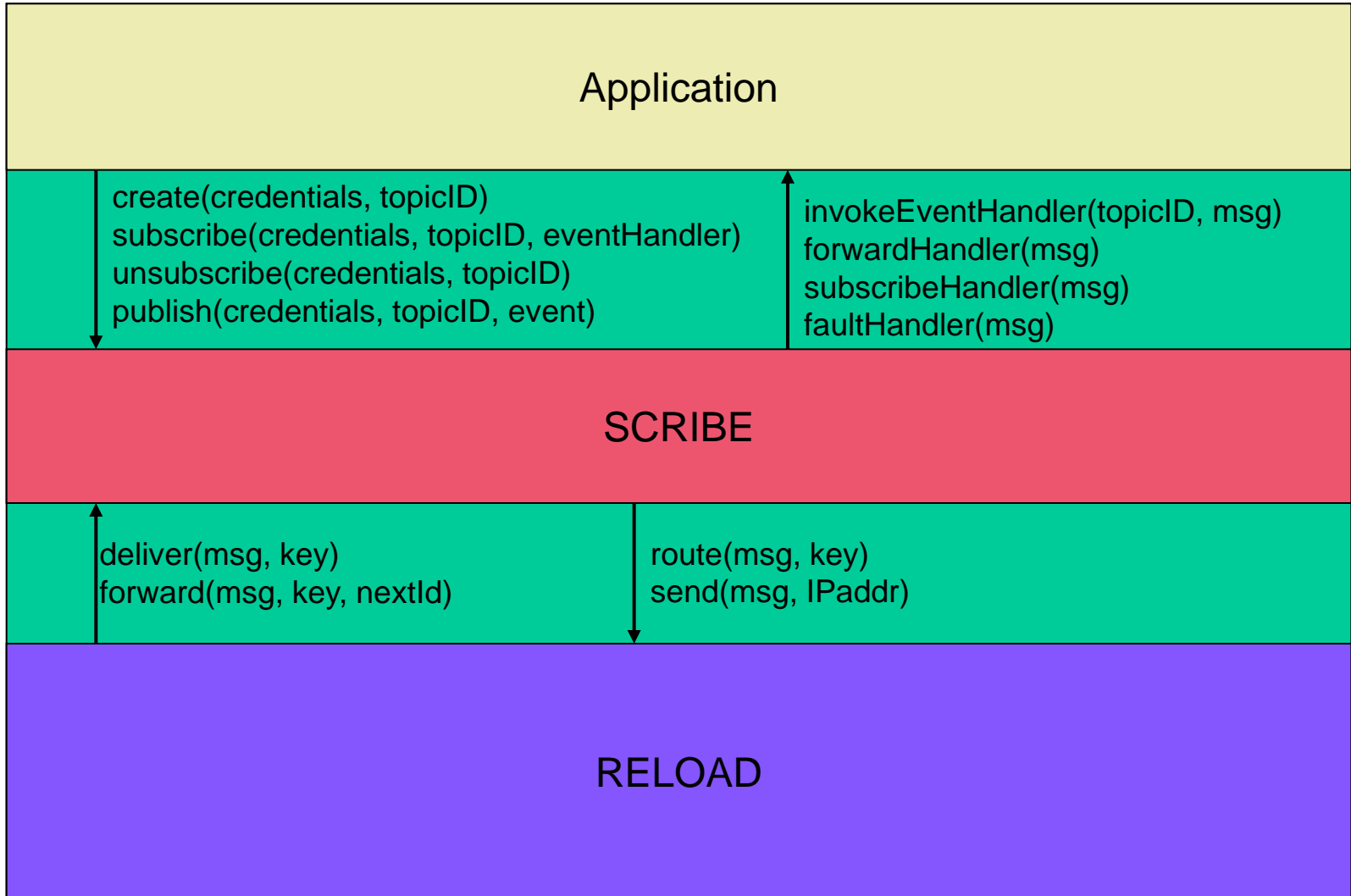


- Usage Layer
 - Set of application data types
- Message Transport
 - Handles end-to-end reliability and request state for usages
- Topology Plug-in
 - Implements specific overlay algorithm
- Forwarding & Link Mgmt
 - Forwarding packets between nodes

P2P-SIP Architecture



Scribe



Message Mapping

Section of draft 01	RELOAD ALM Usage	Scribe [ref]
6.2.1	CreateALMTree	
6.2.2	Join	
6.2.3	JoinAccept	
6.2.4	JoinConfirm	
6.2.5	JoinDecline	
6.2.8	Leave	
6.2.10	Reform	
6.2.11	Heartbeat	
new	Push/Deliver/Send	
		deliver(msg,key)
		forward(msg,key,nextID)
		route(msg,
		send(msg,IPAddr)