

OpenLcbCLib

C Library to build OpenLcb/LCC Nodes on any hardware
Lesson 2 - Protocol Basics

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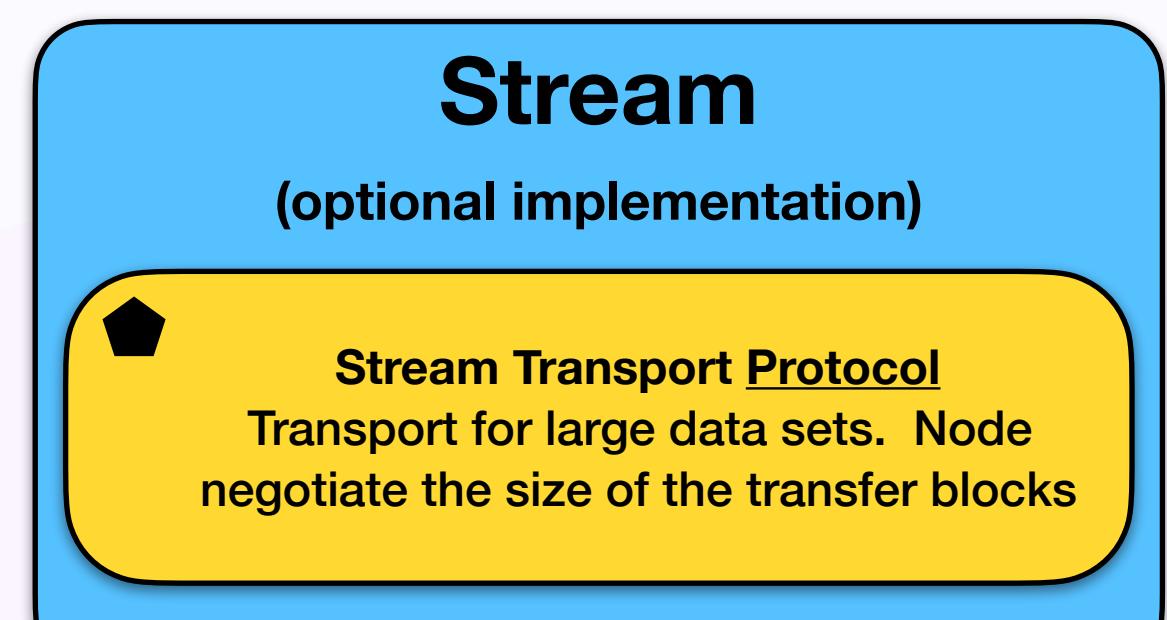
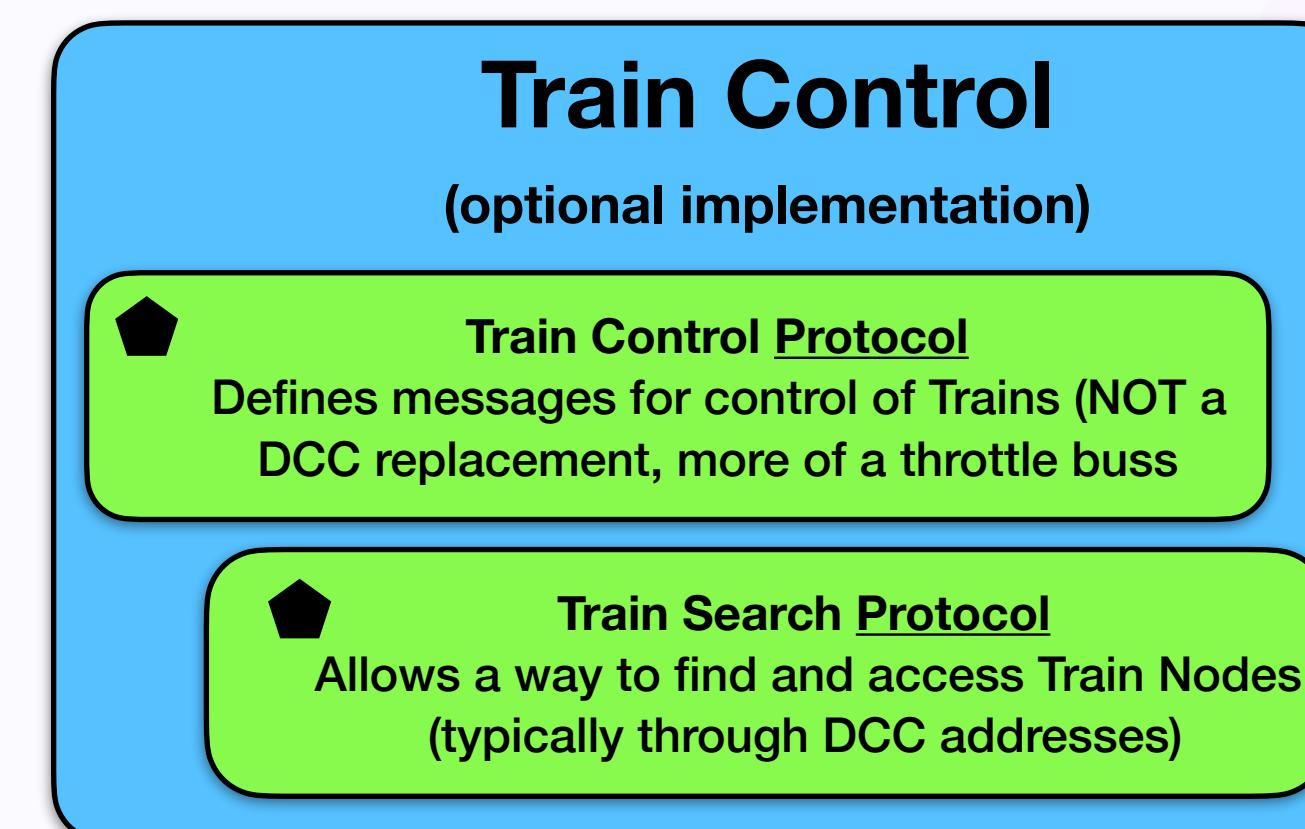
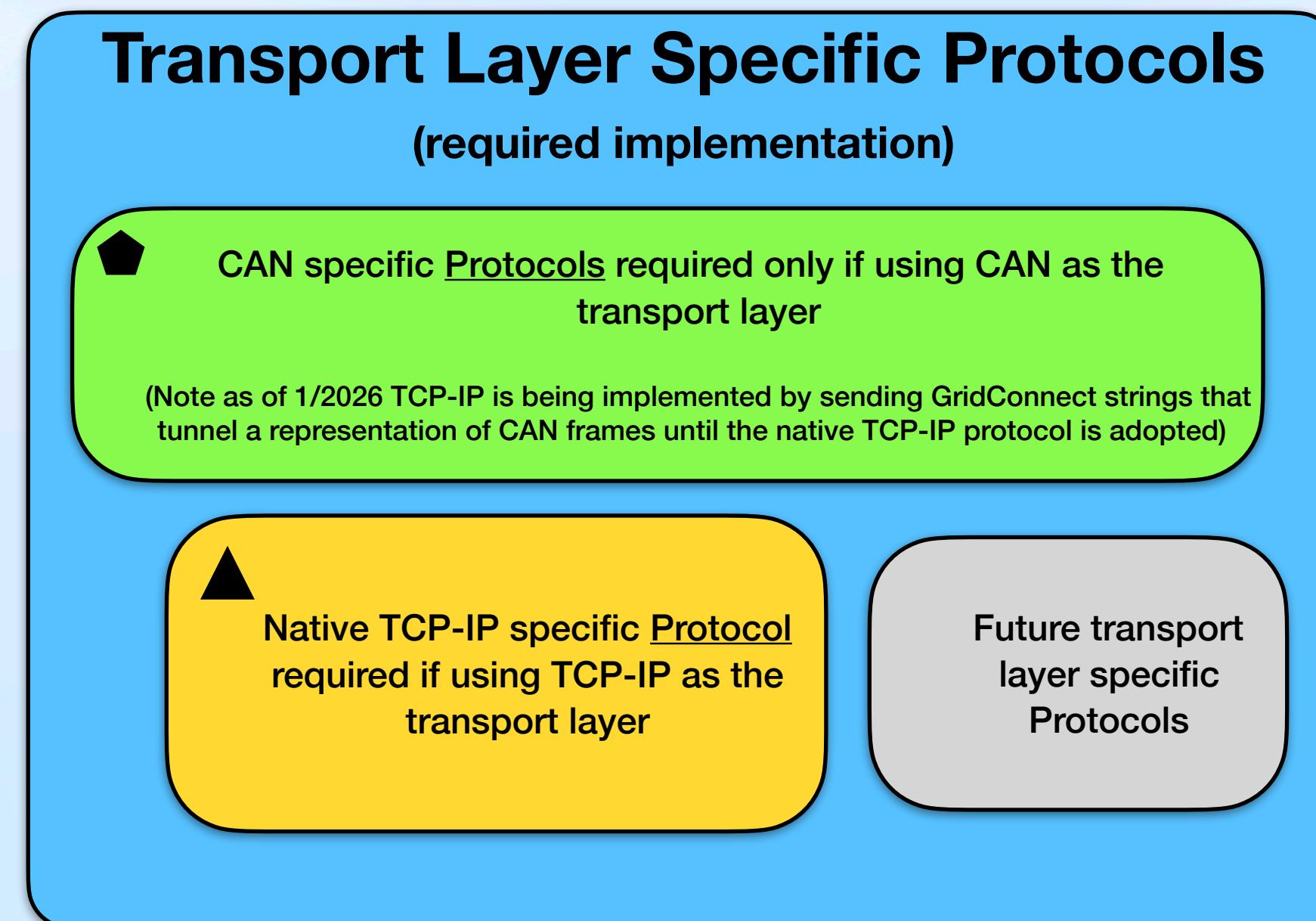
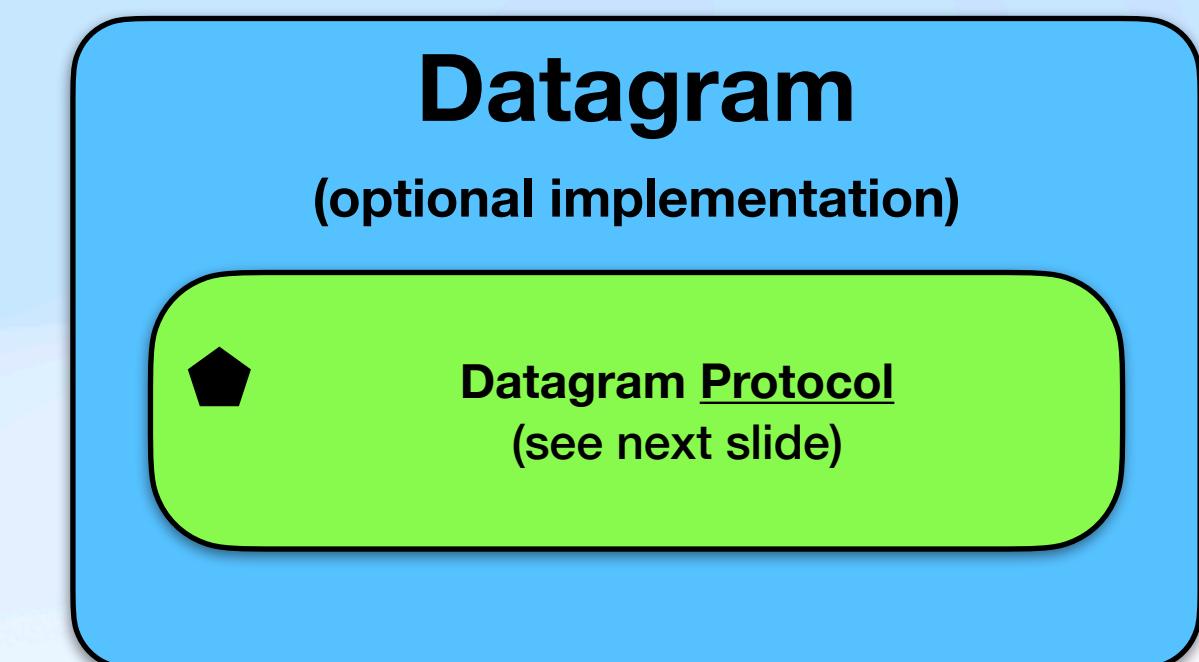
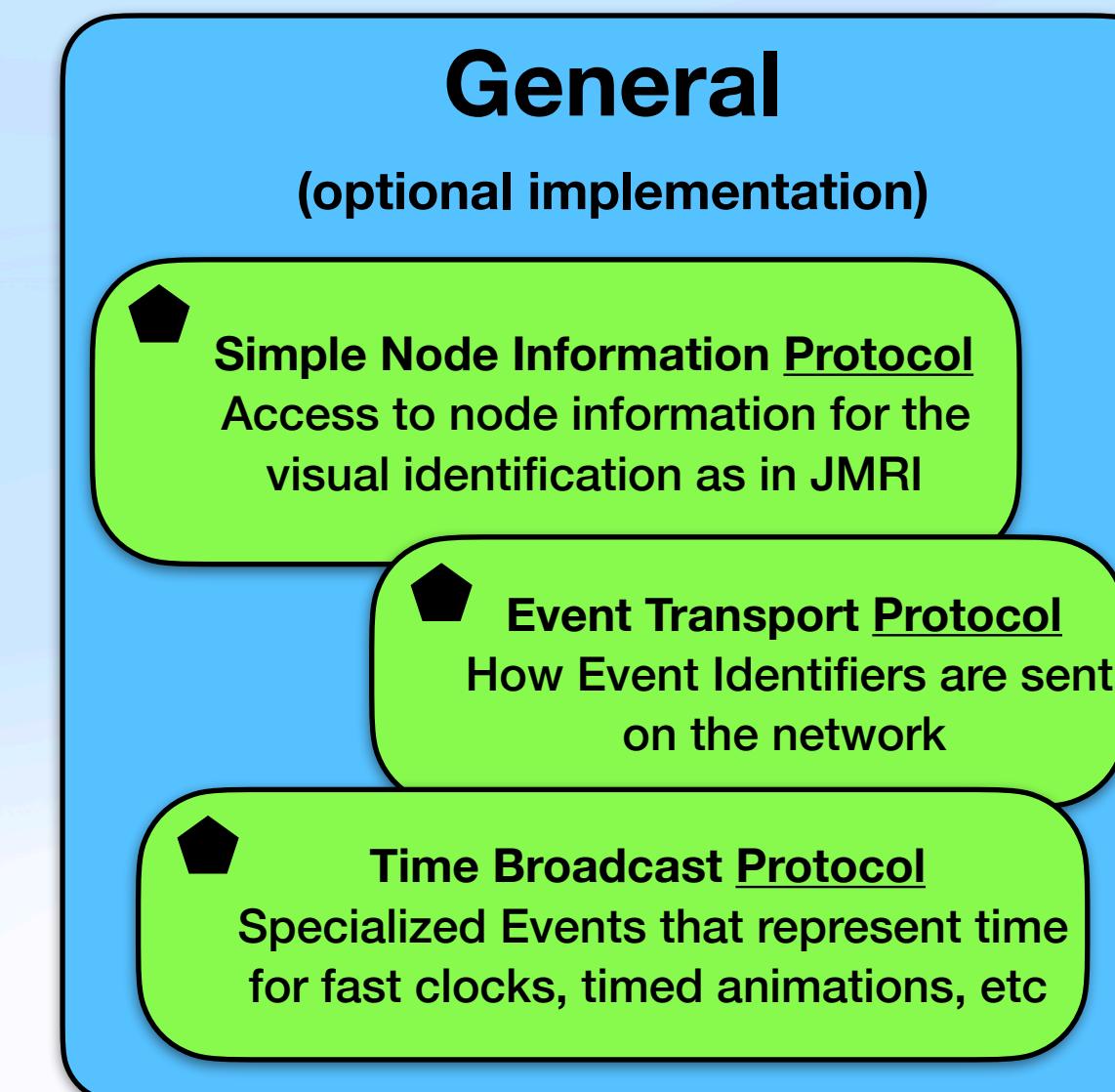
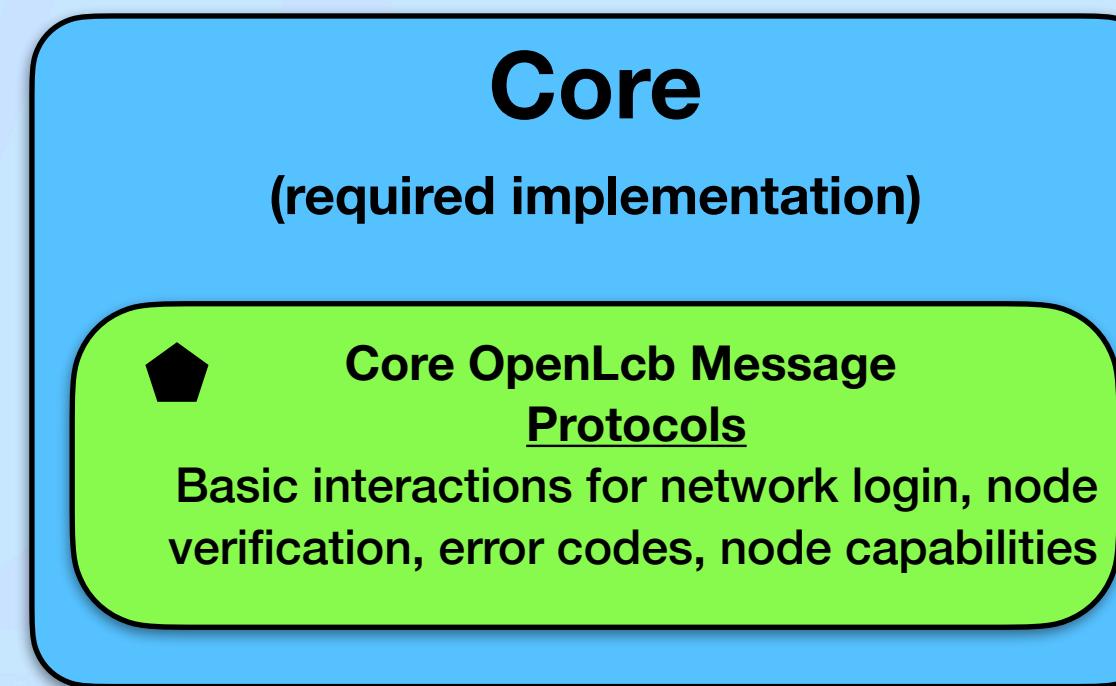
OpenLCB/LCC Protocols Define Node Communication

Applications require a high level understanding of the protocols to know what messages to handle and send

- NMRA Layout Command Control is a subset of OpenLCB
 - The adopted standards for LCC are here: <https://www.nmra.org/lcc>
 - The adopted and proposed standards for OpenLCB are here: <https://github.com/openlcb/documents>
- OpenLCB standards define the messages that are sent between nodes
- There are core OpenLCB message transfer mechanisms that are agnostic to what the physical transport layer is (CAN, TCP-IP, etc)
- There are adaptations to using CAN as the transfer mechanism
 - OpenLCB messages can require transferring large blocks of data and classic CAN data transfers are only 8 bytes; the OpenLCB message must be broken up in to smaller chunks and reassembled on the other end
 - Native TCP-IP transfer is in a draft state as of 1/2026 but will allow complete OpenLCB message to be sent in one blob

OpenLCB/LCC Protocol Overview

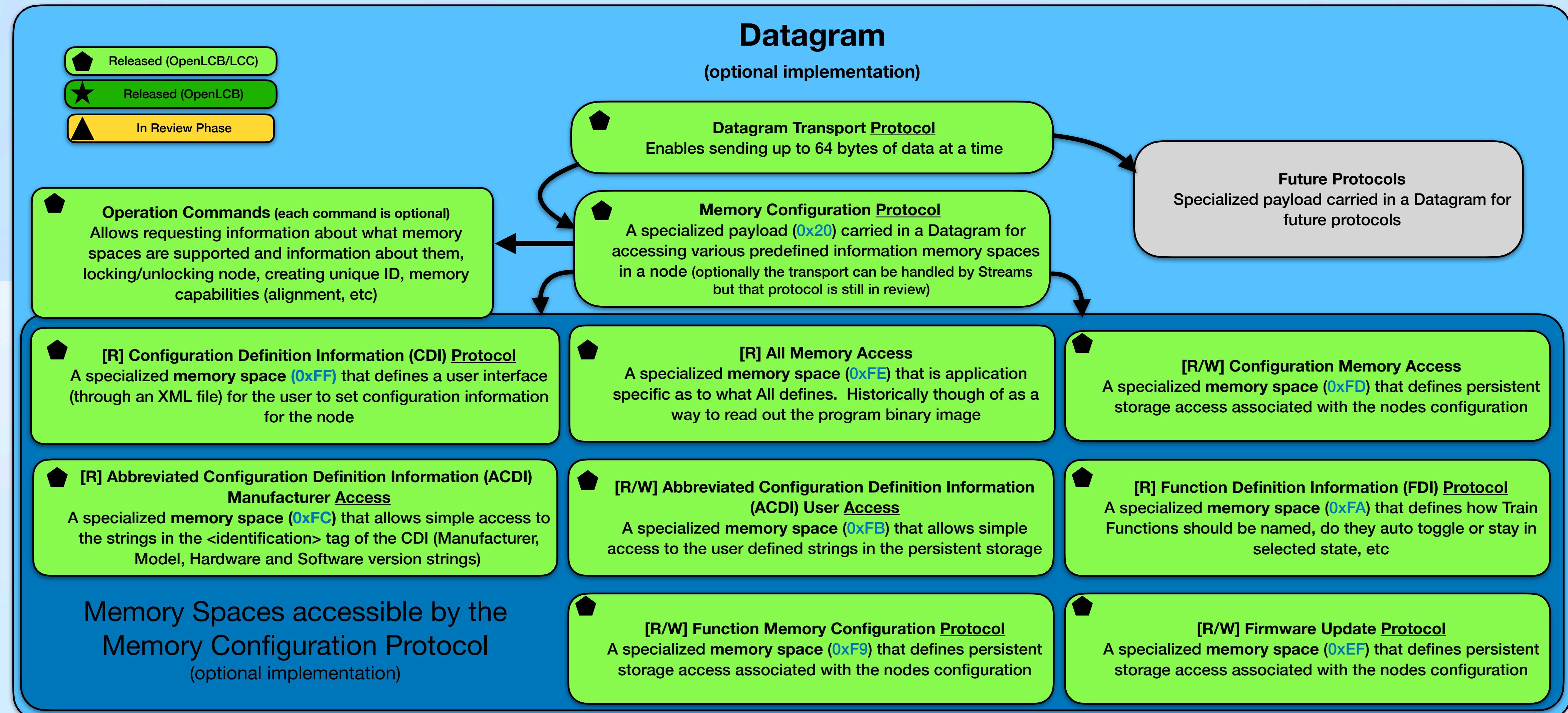
Applications define what optional protocols need to be implemented



- ◆ Released (OpenLCB/LCC)
- ★ Released (OpenLCB)
- ▲ In Review Phase

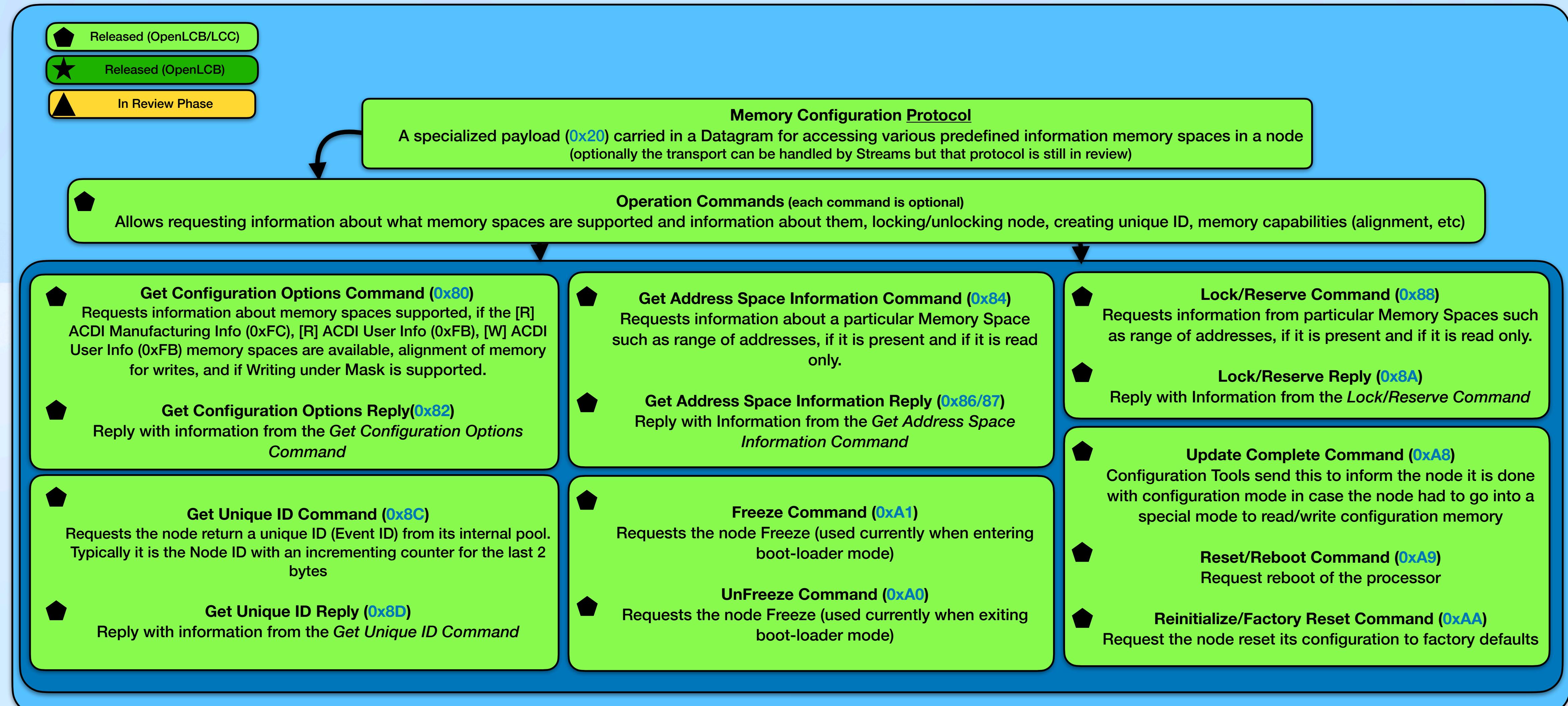
OpenLCB/LCC Datagram Protocols

Most Complex of All Protocols



Memory Configuration Operations Commands

Queries a node for capabilities and supported memory spaces



Designing a Node

Defining what a CAN based node will implement

Core

(required implementation)

◆ Core OpenLcb Message
Protocols

Basic interactions for network login, node verification, error codes, node capabilities

Transport Layer Specific Protocols

(required implementation)

◆ CAN specific Protocols required only if using CAN as the transport layer

(Note as of 1/2026 TCP-IP is being implemented by sending GridConnect strings that tunnel a representation of CAN frames until the native TCP-IP protocol is adopted)

IN WORK

◆ Released (OpenLCB/LCC)

★ Released (OpenLCB)

▲ In Review Phase