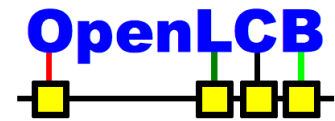# Philosophy

We want OpenLCB to be as flexible as possible, while remaining practical. We have some guiding principles:

1. Keep doors open
2. Think big, act small
3. Design from the top, implement from the bottom.

1. Keep Doors Open

This means that we design so that new things, undoubtedly ones we have not thought of yet, can be added at a later date. In order enable this happen we have:
 - used large ID spaces, allowing ample room for growth and new uses;
 - defined a layered family of protocols which are largely orthogonal to each other;
 - kept in mind that these need to be adapted to transports with limited capabilities.

This principle leads to:

2. Think Big, Act Small

This means that we contemplate and plan for big ideas, big layouts, fast networks, complex interactions BUT we allow and build small layouts, implement simple nodes, use slower transports, and uncomplicated protocols WHILE being able to grow eventually into those big ideas, nodes, transports and layouts.

For example, while we plan for Ethernet backbones, streaming video, and huge layouts, we also design for simplicity, and have built/implemented: anonymous automatic node- and event-IDs, simple-nodes, blue/gold programming, and single segment CAN layouts.

This principle is related to:

3. Design top-down, implement bottom-up

Since OpenLCB is a family of layered protocols, and new protocols will be

added in the future, it is impossible to implement from the top as it is not fully known. However this does not prevent thinking and designing with the big picture, broad ideas, and even dreams in view. On the other hand, implementing from the bottom, e.g. implementing simple nodes on slower transports, keeps real life limitations front and centre, and allows us to match hopes and expectations to reality. We build today, but plan for the future.

Use of Pre-exisiting Standards

A standard is designed to let equipment/systems from different sources operate together. It balances the setting of minimum requirements with not limiting growth. It also must set out safety requirements, and must conform to local, national, and international requirements, where appropriate. Standards require equipment to be designed, built and tested for conformance to the standard. This is time-consuming and in some cases requires sophistocated testing equipment.

Therefore, OpenLCB simplifies this effort by using pre-existing standards wherever possible. This reduces the requirement for procurement, inspection, and testing. For example, OpenLCB uses CAN, CAT, and Ethernet standards as the basis for the Physical Layer Standard and Technical Notes.

These standards are used as is, without an extensions, since this allows OpenLCB to use commercial of the shelf (COTS) equipment which has been certified for those standards. While OpenLCB equipment can be designed such that it exceeds these standards, OpenLCB does not attempt to enhance or extend those standards, as doing so could invalid them, would not allow us to claim conformance to them or use such labelling, and would prevent use of equipment conforming to them. Therefore, such standards are used as written.

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