

How to put the INTERNET IN A BOX

by Adam Holt

If constructionism is the idea that people learn effectively through making things, what could be more inspiring than building off civilization's most pressing struggles and adventures? How can we integrate the globe's environmental and human rights challenges into Sugar's mission? How can we make video games real, providing vivid maps of a child's own city, firing imaginations and animating progress in offline schools in the developing world? And if the Maker Era is more than prefab hype, how can teachers empower kids to build living encyclopedias impactful to themselves and to all?

Early in 2013, Caryl Bigenho and Braddock Gaskill invited me to Caltech to see a working prototype of <http://internet-in-a-box.org>. We brought along several XO laptops to see if this genius community (including many engineers from Jet Propulsion Labs) was all it was cracked up to be.

To our astonishment, the Internet-in-a-Box handheld server steadily streamed learning videos, zoomable offline maps from <http://openstreetmap.org> and a treasure chest of free/open literature/encyclopedia/photos, to almost every iPhone and XO laptop in the room. Look Ma, No Internet -- Wi-Fi is all we need!



Braddock Gaskill's original Internet-in-a-Box installed in the elementary school at the Good Shepherd Women's shelter in Los Angeles where the children use XO-1s in their classrooms. (Photo by Caryl Bigenho)

Perhaps our cherished 20th century trips to Carnegie libraries were forever changed on that day: how can we *now* bring the greatest, most visceral exploration/appropriation, to the world's most disempowered yet constructive kids? What local facts on the ground will best inform meaningful constructionism, 10 years after OLPC began?

We are excited that Braddock's team opened our horizons to genuine attainability of these goals. In a world of lofty and airy promises, where Facebook's Internet.org planes, Google's Loon balloons and Amazon's drones may one day assist Africans to get plugged in: is humanity's centerpiece 21st century goal really just lower-latency advertising, and a fatter pipe?

We are a small OLPC/Sugar community, who depend intimately on Internet collaboration, however we're also convinced life is more than sucking on a pipe. Why is it the couple billion people who remain offline, are so often more passionately curious artisans than we are, less sated with High Definition Distraction? With much deliberation, we decided to join up with Braddock's initiative, to bring practical and localized learning content to XO laptops. And any other HTML5/Javascript/etc educational devices that purposefully take root!

Conveniently during 2011-2013 Tony Anderson, Mitch Seaton, Alex Kleider, Jerry Vonau and David Farning had already pushed our OLPC/Sugar Support Gang to take the school server far more seriously. They made very clear the track record of John Watlington, Martin Langhoff and Daniel Drake working towards countrywide deployments of school servers (OLPC XS) in 2007 to 2012.

We woke up to this legacy, involving teachers and smaller community deployments in Haiti especially, leading to a very strong underlying community school server architecture (see <http://schoolserver.org>, <http://xsce.org> and <https://github.com/XSCE>). As a result, the underlying school server engine (XSCE) has made huge strides in the 3 years since, simplifying setup, easing customizability, and dramatically eliminating IT administration complexity. XSCE 6.0's very comprehensive release is imminent, very soon now in late 2015, for those that want to fire it up: <http://tinyurl.com/xsce-six>

So here we are! It's been an intense 3 years, distributing humble yet powerful school servers to Sugar/XO users especially (but also now to families, orphanages and libraries) each with their own panoply of OS's, devices and (re)boxing styles. In 2015 in Ghana and Rwanda, locals very passionately embraced the "Internet-in-a-Box" idea in schools, libraries and even high school dorms -- validating our convictions around remixable, customizable, offline knowledge. We have confirmed users on almost every continent, in at least a dozen countries, and community documentation will be a special core focus as we scale.

Low-end school servers work on tried and true Raspberry Pi 2 and XO-1.5 laptops especially, with concrete hardware recommendations announced at <http://unleashkids.org> in coming months. In the mid-range and high-end, larger schools generally prefer school servers built on Intel NUC appliances these days.

Looking forward: the overall initiative to put trillions of fascinating-to-kids bits of the Internet into purposeful boxes, may be a never-ending trail, eye-opening at every turn. This trail was built on the Good Will of volunteers and community publishers boxing up Internet gems of all stripe...a civic curation conversation only barely begun! Which hyperlocal languages, customs, inventions and stories can and will survive a Euro-centric or China-centric world? Which cultural treasures should we double down to protect, enhance, and live by? How can Sugar and Gnome best support "investigative journalism" lesson plans, across different ages?

Kids will provide a big part of the answer, exploring offline digital libraries on their own terms -- animating our species as they always have. Thankfully the disciplined community work of "boxing up the Internet" accelerated dramatically when we discovered Wikimedia Switzerland's <http://KiwiX.org>, which includes searchable offline Wikipedias and diverse searchable web snapshots, that just work offline! Emmanuel Englehart's work here is a true inspiration to all; we hope to collaborate with his team at every step.

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