DIGI

YOCTO PROJECT
THE RIGHT CHOICE FOR EMBEDDED SYSTEMS DESIGN

Choosing an operating system (OS) for an embedded system is one of the most complex and critical tasks, with significant long-term ramifications that directly affect both the development effort and the market success of a product.

There are several factors that make choosing a Linux-based OS a smart choice: acquisition cost, source code availability, and its broad architecture support — all these factors lead to a significantly improved time-to-market and a reduction in platform design risk and effort.

However, choosing a specific Linux-based OS can be confusing. A frequently asked question is "With so many Linux-based platforms available in the market, why use the Yocto Project instead of a standard non-embedded binary distribution such as Debian or Ubuntu?" This overview provides the answer to that fundamental question.

Broad embedded community and supplier support

The Yocto Project is often described as an umbrella project, that is, a group of different open source projects hosted by the Linux Foundation that come together to collaborate on tools, best practices and software to help create custom Linux-based embedded operating system platforms.

As such, the Yocto Project is a community of developers and companies, including Silicon Valley vendors like Intel, NXP, Renesas and Texas Instruments, as well as traditional embedded operating systems vendors like MontaVista, Wind River or Mentor Graphics, and also hardware vendors like Digi International and individual developers. Amazingly, these developers working for seemingly competing companies come together for the common good. The Linux Foundation guarantees that the Yocto Project remains independent while keeping it compatible with almost all embedded systems processors, System-On-Chip (SOC) and System-On-Module (SOM) platforms.

"With so many Linux-based platforms available in the market why use the Yocto Project instead of a standard non-embedded binary distribution such as Debian or Ubuntu?"

The Yocto Project was created for embedded systems. This is something to keep in mind when considering non-embedded distributions, as they lack the flexibility needed to accomplish target footprint sizes and functionality tweaks. We often see device manufacturers and platform providers alike choosing binary-based distributors, like Debian, struggling to modify them for specific needs and ending with custom and increasingly complex operating systems difficult to maintain and port.

Alex González

Software Engineering Supervisor
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Alex is a leading authority on Embedded Linux platforms and is the author of *Embedded Linux Projects Using Yocto Project Linux.*

Alex has been using Linux since 1994 and started working professionally with embedded systems in 1999, designing products for video advertising over IP networks. He is currently Software Engineering Supervisor at Digi International, working on Linux Board Support Packages (BSPs) for Digi's embedded modules range, and Product Owner of the Digi Embedded Linux and Android Scrum team.

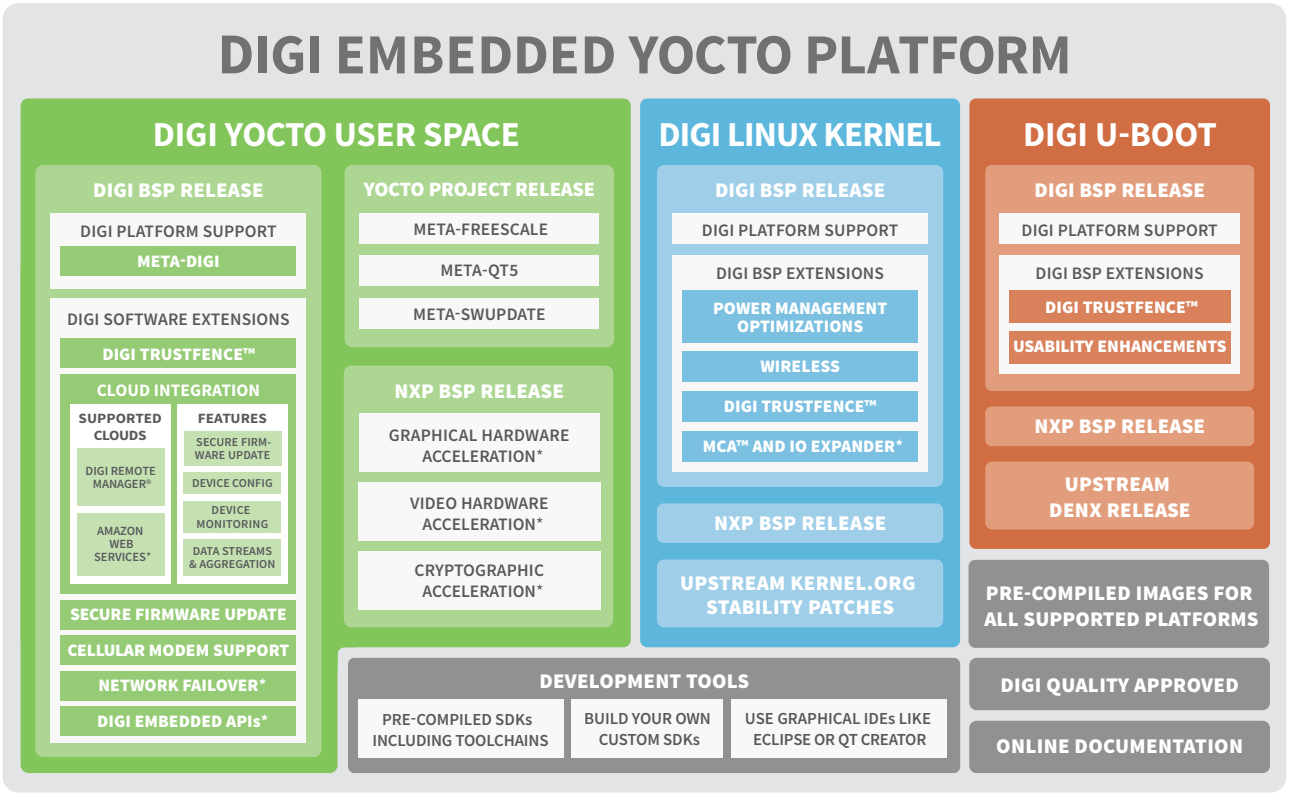
Born and raised in Bilbao, Spain, he moved to the UK after obtaining an Electronic Engineering degree from the Basque Country University. He lived and worked over 10 years in the UK where he completed an MSc in Communication Systems at the University of Portsmouth and a BSc in Computer Science from the Open University, before returning to Spain following his interests in machine-to-machine (M2M) and the Internet of Things and joining Digi International.

Stable and regular releases with long-term support

Security and software updates also need to be taken into account. The Yocto Project has a new, stable release every six months, and maintains stable branches for up to two years. In addition, silicon vendors and embedded platform suppliers like Digi International often extend the support period to up to five years, or even more. The Yocto Project community is very quick to react to software vulnerabilities, and patches get upstreamed and backported very quickly. These updates include specific embedded software packages which non-embedded distributions often don't bother to update as they are not used by their community.

Software updates in embedded systems also require special consideration. Most Linux-based operating system platforms, including the Yocto Project, are able to update software packages using standard package management software like RPM or APT.

For embedded developers that prefer whole system updates that guarantee the system runs well-tested software that has not been incrementally patched, Digi International for example extends the Yocto Project to include over-the-air firmware updates specially designed for embedded systems.



*ONLY ON SUPPORTED PLATFORMS OR RELEASES

Simplified open source and copyright licenses management

An often overlooked area when choosing a Linux-based OS is that of software licenses. Legal departments are not often involved in technical decisions like choosing an embedded OS, but sooner or later they will have to deal with license compliance issues like open source license contamination, digital rights management, patent retaliation etc. And these are the type of things likely to delay the delivery of a product big time.

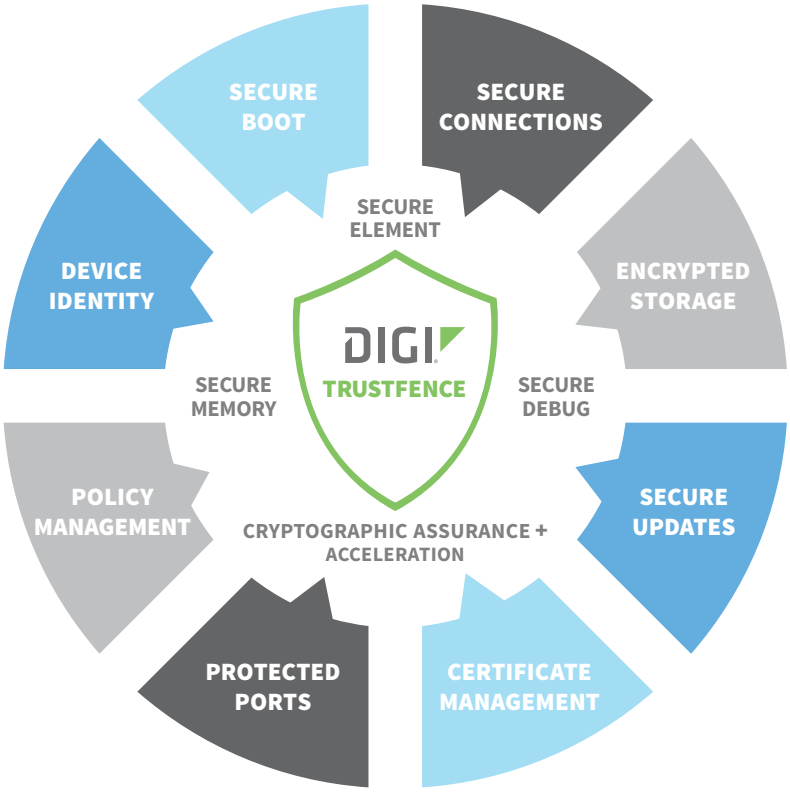
Again, the Yocto Project has been designed with license compliance at heart. It has a dedicated group, the License Infrastructure Interest Group, that works on making the Yocto Project license aware. It can add and remove software based on specific license groups, identifies license incompatibilities, and generates open source license inventories that legal departments can use to audit software products.

What can Digi do for you?

Now that you are hopefully convinced about using the Yocto Project, what can Digi do for you?

Digi's fully featured, robust and extensively tested Linux based distribution, Digi Embedded Yocto, includes Board Support Packages (BSPs) for Digi's embedded System-on-Modules (SOMs) and Single Board Computers (SBCs). We continuously add software features that are not part of the standard Yocto Project, like Digi TrustFence™.

Digi TrustFence Security Framework offers local and over-the-air (OTA) firmware updates. Digi Remote Manager® supports device management and device health, third-party cloud connectivity, and out-of-the-box support for Digi XBee® Cellular and a wide range of popular third-party cellular modems (Telit, Sierra Wireless, u-blox, Quectel, and others.)



We also provide complete software support and design services expertise that complements the Yocto Project community support, so you can focus on your core competency of designing products. Quickly, without the traditional design risk and effort, and Digi as software and hardware partner on your side.

For more information about Digi System-on-Modules, Digi Single Board Computers, and Digi TrustFence visit www.digi.com

1-877-912-3444

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