Frequently Asked Questions on OpenVPX

1. **Why was OpenVPX created in the first place?**
   The US Department of Defense and other users are mandating improved implementation of open standards and interoperability. VPX specifications have been focused at the board level, but there is also a need for considering system-level requirements to improve interoperability and reduce customization, testing, cost, and risk.

2. **What are the general OpenVPX features?**
   - OpenVPX is a defined set of system implementations within VPX
   - Specifies a set of *system* architectures
   - Uses existing VPX REDI standards and drafts with minimal possible changes
   - Defines multiple *planes* for Utility, Management, Control, Data, Expansion
   - Defines various sizes of *pipes* used for serial communication
   - Defines several types of *profiles* for structure and hierarchy in the specification (slot profile, backplane profile, module profile, development chassis profile)
   - Backplane profiles define the backplane topology (types: centralized and distributed switching, and host/slave)

3. **What is OpenVPX used for?**
   OpenVPX is a defined set of system implementations within VPX, defining a set of system architectures and providing a framework for interoperability between modules and backplanes. With OpenVPX, system integrators can more readily architect an application specific system based on compatible OpenVPX profiles for modules, backplanes, and development chassis.

4. **Does OpenVPX replace VPX?**
   No. OpenVPX is a system specification for VPX that provides a defined framework for interoperability between OpenVPX products. OpenVPX leverages the VPX dot specs for details such as fabric protocols.

5. **What's the difference between VPX and OpenVPX?**
   OpenVPX builds on VPX dot specs and provides a defined framework for interoperability between OpenVPX products based on compatible OpenVPX profiles for modules, backplanes, and development chassis.

6. **How fast is OpenVPX?**
   OpenVPX builds on VPX dot specs for fabric protocols, so it is the same speed as VPX, currently supporting up to 3.125 Gbps per pair with plans to support up to 6.25 Gbps in the near future for PCIe gen2 and SRIO gen2.

7. **What is an OpenVPX slot profile?**
   An OpenVPX slot profile is a physical mapping of Ports onto a given slot's backplane Connectors. These definitions are often made in terms of Pipes. Unlike Module Profiles, a Slot Profile never specifies protocols for any of the defined Ports. Profile Parameters are used to further describe properties of a Slot Profile.

8. **What is an OpenVPX module profile?**
   An OpenVPX module profile is a physical mapping of Ports onto a given Module's backplane Connectors and protocol mapping(s), as appropriate, to the assigned Port(s). This definition provides a first-order check of operating compatibility between Modules and slots as well as between multiple Modules in a Chassis. Profile Parameters are used to further describe properties of a Module Profile.

9. **What is an OpenVPX backplane profile?**
   An OpenVPX backplane profile is a physical definition of a backplane implementation that includes details such as the number and type of slots that are implemented and the topologies used to interconnect them. Ultimately a Backplane Profile is a description of Channels and Buses that interconnect slots and other physical entities in a backplane. Profile Parameters are used to further describe properties of a Backplane Profile.

10. **What is an OpenVPX development chassis profile?**
    An OpenVPX development chassis profile is a physical definition of a development chassis implementation that includes details such as the chassis type, slot count, primary power input, module cooling type, backplane profile, and supplied backplane power that are implemented in the development chassis profile.

11. **What are OpenVPX planes used for?**
    OpenVPX planes are a physical and logical interconnection path between elements of a system used for the transfer of information between elements. The following Planes are predefined by OpenVPX: Control Plane, Data Plane, Expansion Plane, Management Plane, Utility Plane.

12. **What are OpenVPX pipes used for?**
    OpenVPX pipes are a physical aggregation of differential pairs used for a common function that is characterized in terms of the total number of differential pairs. A Pipe is not characterized by the protocol used on it. The following Pipes are predefined by OpenVPX: Ultra Thin Pipe (UTP), Thin Pipe (TP), Fat Pipe (FP), Double Fat Pipe (DFP), Quad Fat Pipe (QFP), Octal Fat Pipe (OFP).

13. **What styles of OpenVPX backplanes are available?**
    OpenVPX backplanes are available in lengths between one and twenty-one slots. On most standard backplanes, boards are located on 1.0" centers (i.e. 1.0" pitch), though 0.8" pitch or 0.85" pitch may also be used. Backplanes are available in 3U and 6U form factors. Furthermore, there are many different profiles available for OpenVPX backplanes:
    - Central switch topologies
    - Distributed topologies
    - Root-leaf topologies

14. **Can I get conduction cooled OpenVPX hardware?**
    Yes. A popular OpenVPX card style is the conduction cooled module. These are used mainly in military and aerospace applications where convection cooling cannot be used. These allow heat to conduct through the printed circuit board or through a conduction plate on the module. Expanding wedge locks then transfer the heat out to the chassis through wide slots cut into the metal chassis sidewalls.

15. **What are the OpenVPX connector pin assignments?**
    OpenVPX connector pin assignments are defined in several slot profiles aimed at different types of slots:
    - Payload slot profiles
    - Switch slot profiles
    - Peripheral slot profiles

16. **Are user defined pins available for I/O signals in OpenVPX?**
    Yes. The user I/O pins are defined in the slot profiles.

17. **What power supplies are available on the OpenVPX backplane?**
    This is the same as VPX with the exception that OpenVPX currently does not support the 48V power option for 6U modules. OpenVPX also encourages more standardization in the use of the primary power rails but the rails are unchanged from VPX.

18. **Where can I get a copy of the VPX and OpenVPX specification?**
    VPX and OpenVPX are ANSI/VITA approved standards - ANSI/VITA 46 and ANSI/VITA 65. They are available for purchase from VITA at https://vita.com/secure/online-store.html.